

radar

Radar, an acronym for "Radio Detection and Ranging," is a technology that has revolutionized our ability to detect, track, and analyze objects in various applications. By emitting radio waves and measuring their reflections, radar systems provide valuable information about the range, speed, direction, and shape of objects in their vicinity. Originally developed for military purposes, radar has found extensive use in civilian domains such as weather forecasting, air traffic control, maritime navigation, and automotive safety. Its ability to operate day or night, in any weather conditions, makes radar an essential tool for surveillance, communication, and situational awareness, greatly enhancing our ability to understand and interact with the world around us.

manufacturers

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Poland Wspólna 70, Warsaw, Mazowieckie 00-687, PL

+48 221 822 534



Power conversion modules & UPS





www.synqor.com

COMPANY OVERVIEW

SynQor® is a leading supplier of power conversion solutions to the military, industrial, rail transportation, commercial avionics, medical and telecom/datacom markets. SynQor's innovative products are designed to exceed the demanding performance, quality, and reliability requirements of today's power electronic engineers and system integrators who develop leading-edge infrastructure hardware.

MCOSTS DC-DC CONVERTER



MCOTS PRODUCT FEATURES

- High efficiency, up to 95% at full rated load current
- Fixed frequency switching provides predictable EMI
- No minimum load requirement

COMPLIANCE FEATURES

MilCOTS converters with MilCOTS filters are designed to meet:

MIL-HDBK-704

PROTECTION/CONTROL FEATURES

- Input under-voltage lockout
- Output current limit and short circuit protection
- Active back bias limit
- Output over-voltage protection

- Rugged design for harsh environments
- Full Feature option on some models
- ► Flanged baseplate available
- Industry standard pin-out configurations and
- standard footprints.
- Available: High-capacitance option for very large
- output capacitance and extreme transient applications
- ► -55 °C to +100 °C Operating Temperature
- ▶ RTCA/DO-160 Section 16, 17, 18
- ▶ MIL-STD-1275
- ▶ MIL-STD-461
- ▶ DEF-STAN 61-5 (part 6)/(5, 6)
- Thermal shutdown (not on DM Package Size)
- On/Off control referenced to input side
- (ON/OFF control islolated in Full Bricks)
- Remote sense for the output voltage
- Digital Output Current Sharing (HZ & HY only)
- Output voltage trim range of: +10% to -20% (Half-Brick Zeta/Yota) (Quarter-Brick Exa) (Sixteenth Brick) +10% to -50%

INQOR DC-DC CONVERTER



OPERATIONAL FEATURES

- ► High efficiency up to 95%
- Input voltage ranges from 9 V to 425 V
- Output power up to 600 W
- ► Fixed frequency switching, low output noise
- No minimum load requirement
- ► Full Feature option on some models
- Industry standard pin-out configurations and standard footprints
- Operating Temperature -40 °C to +100 °C
- Output Voltage Set Point ±1.0%
- Output Voltage Ripple <1% of Vout (typ.) pk-pk
- ► Isolation Voltage Up to 4250 Vdc

PROTECTION/CONTROL FEATURES

- Input under-voltage lockout
- Output current limit and short circuit protection
- Active back bias limit prevents damage to
- converter from external load induced pre-bias
- Digital output current sharing (Half Brick Zeta only)
- Output over-voltage protection
- Thermal shutdown
- ► Trimmable output voltages

EFFICIENCY



Continuous InpuT	34-160 V	
Output	1.8-48 V	T
Max Power	120 W	IN
Reinforced Isolation	3000 Vdc	
Quarter Brick	DC/DC Converter	



ISOLATED DC-DC CONVERTERS

			12 V	DC INPUT (9-22 VDC I	NPUT RANG	GE, TRANSI	ENT 25 V)				
	VOUT	1.8 V	3.3 V	5 V	7 V	12 V	15 V	24 V	28 V	30 V	40 V	48 V
Half Brick	HPC	60 A 108 W	V 50 A 165 W	36 A 180 W		15 A 180 W	12 A 180 W	7.5 A 180 W	6.5 A 182 W		4.5 A 180 W	3.7 A 178 W
	нтс	50 A 90 W	40 A 132 W	28 A 140 W		12 A 144 W	9.5 A 143 W	6 A 144 W	5 A 140 W		3.5 A 140 W	3 A 144 W
Quarter	QTC	40 A 72 W	30 A 99 W	20 A 100 W	14 A 98 W	8 A 96 W	7 A 105 W	4 A 96 W		3 A 90 W		2 A 96 W
Brick	QCC	30 A 54 W	20 A 66 W	15 A 75 W	10 A 70 W	6 A 72 W	5 A 75 W	3 A 72 W		2.4 A 72 W		1.5 A 72 W

			24	4 VDC INP	UT (18-36)		RANGE, 1	FRANSIEN	F 50 V)				
	VOUT	1.8 V	3.3 V	5 V	7 V	12 V	15 V	24 V	28 V	30 V	40 V	48 V	50 V
	HZC			60 A 300 W		42 A 504 W	34 A 510 W	21 A 504 W	18 A 504 W		12.5 A 500 W		10 A 500 W
Half	HEC								14 A 392 W				8 A 400 W
BLICK	НРС	60 A 108 W	50 A 165 W	40 A 200 W		8 A 216 W	8 A 216 W	9 A 216 W	7.5 A 210 W		10 A 500 W	4.5 A 216 W	
	нтс	50 A 90 W	40 A 132 W	30 A 150 W		13 A 156 W	10 A 150 W	6.5 A 156 W	5.5 A 154 W		4 A 160 W	3.3 A 158 W	
	QTC	40 A 72 W	30 A 99 W	20 A 100 W	14 A 98 W	8 A 96 W	8 A 120 W	5 A 120 W		4 A 120 W		2.5 A 120 W	
Quarter Brick	QGC	32 A 58 W	25 A 83 W	18 A 90 W	13 A 91 W	7.5 A 90 W	6 A 90 W	3.7 A 89 W		3 A 90 W		1.8 A 91 W	
	QMC									2 A 60 W		1.2 A 58 W	
Sixteenth Brick	SGC		15 A 50 W	10 A 50 W	7 A 49 W	4 A 48 W	3.3 A 48 W	2 A 48 W	1.8 A 50 W			1 A 48 W	

	48 VDC INPUT (34-75 VDC INPUT RANGE, TRANSIENT 100 V)												
	VOUT	1.8 V	3.3 V	5 V	7 V	12 V	15 V	24 V	28 V	30 V	40 V	48 V	50 V
	HZC			60 A 300 W		50 A 600 W	40 A 600 W	25 A 600 W	21.5 A 602 W		15 A 600 W		12 A 600 W
Half Brick	HPC	60 A 108 W	60 A 198 W	46 A 230 W		21 A 252 W	17 A 255 W	10.5 A 252 W	9 A 252 W		6.3 A 252 W	5.2 A 250 W	
	НТС	50 A 90 W	45 A 149 W	34 A 170 W		16 A 192 W	13 A 195 W	8 A 192 W	7 A 196 W		5 A 200 W	4 A 192 W	
Quarter	QTC	40 A 72 W	30 A 99 W	25 A 125 W	20 A 140 W	12 A 144 W	10 A 150 W	6 A 144 W		5 A 150 W		3 A 144 W	
Brick	QGC	32 A 58 W	25 A 83 W	21 A 105 W	15 A 105 W	9 A 108 W	7 A 105 W	4.5 A 108 W		3.5 A 105 W		2.2 A 106 W	
Sixteenth Brick	SGC	28 A 50 W	15 A 50 W	10 A 50 W	7 A 50 W	4.1 A 50 W	3.3 A 50 W		1.8 A 50 W				

	72 VDC INPUT (42-110 VDC INPUT RANGE)												
	VOUT	1.8 V	3.3 V	5 V	7 V	12 V	15 V	24 V	28 V	30 V	40 V	48 V	
Half	HPC	60 A 108 W	60 A 198 W	46 A 230 W		21 A 252 W	17 A 255 W	10.4 A 250 W	9 A 252 W		6.3 A 252 W	5.2 A 250 W	
Brick	НТС	50 A 90 W	45 A 149 W	34 A 170 W		16 A 192 W	13 A 195 W	8 A 192 W	7 A 196 W		5 A 200 W	4 A 192 W	
Quarter	QTC		30 A 99 W	25 A 125 W	20 A 140 W	12 A 144 W	10 A 150 W	6 A 144 W		5 A 150 W		3 A 144 W	
BLICK	QGC		5 A 83 W	20 A 100 W	15 A 105 W	9 A 108 W	7 A 105 W	4.5 A 108 W		3.5 A 105 W		2 A 96 W	

	110 VDC INPUT (66-160 VDC INPUT RANGE, TRANSIENT 170 V)												
	VOUT	3.3 V	5 V	7 V	12 V	15 V	24 V	28 V	30 V	40 V	48 V		
Half	HPC	60 A 198 W	48 A 240 W		21 A 252 W	17 A 255 W	10 A 240 W	9 A 252 W					
Brick	НТС	45 A 149 W	34 A 170 W		16 A 192 W	13 A 195 W	8 A 192 W	7 A 196 W					
Quarter	QTC	30 A 99 W	25 A 125 W	20 A 140 W	12 A 144 W	10 A 150 W	6 A 144 W		5 A 150 W				
BLICK	QGC	23 A 76 W	18 A 90 W	15 A 105 W	9 A 108 W	7 A 105 W	4.5 A 108 W		3.5 A 105 W				



PRODUCT FAMILY MATRIX





170 V

75 V

Input Voltage		Output	Package	Series	Thermal	Maximum		Optior	s Description:
Voltage	Mode	Voltage	Size	Series	Design	Current	Enable Logic	Pin Length	Feature Set
IQ	12: 9-22 V 18: 9-36 V 24: 18-36 V 32: 9-75 V 36: 18-75 V 48: 34-75 V 64: 18-135 V 68: 12-150 V 70: 34-135 V 72: 42-110 V 90: 34-160 V 1B: 66-160 V 2H: 90-210 V 4H: 180-425 V	012: 1.2 V 015: 1.5 V 018: 1.8 V 025: 2.5 V 033: 3.3 V 050: 5 V 070: 7 V 120: 12 V 150: 15 V 240: 24 V 280: 28 V 300: 30 V 400: 40 V 480: 48 V 500: 50 V	S: Sixteenth Brick Q : Quarter Brick H : Half Brick F : Full Brick	K: Kilo M: Mega G: Giga T: Tera P: Peta E: Exa Z: Zeta	C: Encased D: Encased, Non-threaded Baseplate V: Encased, Flanged Baseplate	60: 60 A 50: 50 A 30: 30 A 10: 10 A 06: 6 A 02: 2 A (not all shown)	N: Negative	K: 0.110" N: 0.145" R: 0.180" Y: 0.250"	S: Standard (1/8 & ¼ only) C: Current monitor output/ trimmable current limit (1/8 & ¼ only) F: Current share/ trimmable current limit (half brick only)



HEMP, EMI/EMC Power Line Filters





www.mpe.co.uk

COMPANY OVERVIEW

MPE Limited, based in the UK, is a world leading manufacturer of high performance EMC/EMP filters and capacitor products for supply to the automotive, defence, telecoms and other professional industries.

Our 98 year business history is a testament to our unrelenting commitment to Quality, Reliability & Performance.

• Describtion

A range of high performance communications filters designed for carrying analogue telephone circuits into shielded rooms and communications cabins, and also used as in-line filters for Information Security applications. Filters are offered in two performance variants each available with varistor transient protection to offer additional protection of circuits against the effects of EMP and other conducted transients.





APPLICATIONS

- 300Ω/600Ω analogue telephone lines for POTS/PSTN telephone, fax and modem circuits
- Shielded rooms, communication cabins and Sensitive Compartmented Information Facilities (SCIFs)
- ► TEMPEST applications
- Available with transient suppression for EMP protection systems
- Filter circuits approved by British Telecom and other PTT's
- Not suitable for digital ISDN lines see separate MPE Data Line Filter catalogue

FEATURES

- Circuits are supplied as high symmetry matched pairs; 1 telephone circuit = 1 matched pair = 2 lines
- Standard products offer the choice of 2, 4, 8, 32, 40, 100, 200 or 240 lines
- Choice of packaging and mounting styles available
- ► High performance or extended performance levels available
- Performance exceeds 100dB attenuation (50Ω system)
- Performance extends beyond 10GHz
- Pass band ripple

 $\label{eq:Frequency} Frequency (Hz) \\ Asymmetric Perfomance in 50\Omega System with or without Load$

Extended Performance Range 100 dB from 14kHz

High Perfomance Range 100 dB from 25kHz



DC-DC Converters



MOTIEN TECHNOLOGY

www.motien.com.tw

COMPANY OVERVIEW

MOTIEN Technology is the professional and leading manufacturer of power solution since the establishment on 1998, with the great efforts and continually improvement for decades on power supplies, the brand MOTIEN has become well known and a symbol of quality and preferred & trusted DC power source.

Motien has more than 30 series of DC/DC converters, LED drivers and AC/DC converter modules. Products are widely built in modern electronic equipments: Industries Automation equipments, Telecommunication equipments, instruments, transportation system, medical equipments etc.

GENERAL SPECIFICATION

- Power rating: 0.25W~60W
- DC / DC converters, LED drivers
- Customized products
- Minor change of standard product
- New product development

PRODUCT GROUPS



RAILWAY SERIES	SMD SERIES
ISOLATED DC/DC CONVERTERS	NON - ISOLATED DC/DC CONVERTERS
SIP-PackagesDIP-Packages	SIP-PackagesSMD-Packages



Thermal Pads

EMI Shielding Components





www.p-p-t.co.uk

COMPANY OVERVIEW

About EMC EMI shielding solutions EMCEMI Staff have between them, over 50 years' experience in the manufacturing processes involved in making high quality & reliable EMC & RFI components, while specialising in the manufacture and supply of a wide range of products which are manufactured at our brand new factory in Essex in the United Kingdom. We manufacture components to MIL83528C specification.

		So	
Conductive Elastomers	Conductive Elastomers	Conductive Elastomers Moulded 'O' Rings	Co-extrusion Conductive Gasket
Aluminium Honeycomb Vents	Round Aluminium Honeycomb Vents	Steel Honeycomb Vents	Oriented Wires in Silicone
			0
Knitted Wire Mesh	Knitted Wire Mesh over Elastomer Core	Knitted Wire Mesh with Enviromental IP Carrier	Knitted Wire Mesh Moulded to Silicon- Fluorosilicone
Fabric Over Foam	Neoprene Sponge	Copper & Aluminium Conductive Foil Tape	S //s
8			
Compressed Mesh 'O' Rings	Conductive Sponge Material	Thermal Graphite	Composite Wire Mesh
Expanded Wire Gasket	Co-extrusion Conductive	Thermal Gap Pad	Connector Gaskets
Silicone	Copper Fingerstock	Shielded Windows	Thermal Pad



GaN, LDMOS, VDMOS Transistors



POLYFET RF DEVICES

www.polyfet.com

COMPANY OVERVIEW

Polyfet RF Devices is a manufacturer of broad band RF power transistors and power modules. They are a private corporation that has been in business since 1988. The devices consist of Gallium Nitride, LDMOS, and VDMOS technologies processed using state of the art Equipment.

LDMOS				FLANC	ED M	ουντ				28 VOLT				GALL	IUM NI [.]	RIDE	TRAI	NSISI	ORS			
	Pout	Freq	Gain	theta	gm	ldsat	Ciss	Crss	Coss		GaN				FLANG	ED MC	υΝΤ				28	3 VOLT
Part No	w	Mhz	dB	jc	mho	Α	pf	pf	pf	Style		Pout	Freq	Gain	theta	eff	Idsat	Ciss	Crss	Coss		
LP701	35	500	12	1,8	1,6	10	60	1,6	30	Single Ended	Part No	W	Mbz	dB	ic	%	Δ	nf	nf	nf		Style
LC401	60	500	12	1,3	2,7	17	80	4	50	Single Ended	CD1001	10	2500			50		7			C i	la Eusela d
LP702	70	500	12	1	3,2	20	120	3,2	60	Single Ended	GP1001	10	2500		5,45	50	2,4	3	0,17	1,6	Sing	lle Ended
LK701	70	500	14	1	1,6	10	60	1,6	30	Push - Pull	GP2001	20	2000	11	4.2	65	7.2	7.2	0,17	4	Sing	ile Ended
LK702	90	500	13	0,6	3,2	20	120	3,2	60	Push - Pull	G22001	20	2000	11	4,2	65	7,2	7,2	0,56	4	Sing	le Ended
LX501A	100	500	12	0,75	4,8	30	150	7,5	100	Single Ended	GX2001	20	2000	11	3,5	65	7,2	7,4	0,56	4,5	Sing	le Ended
LZ402	125	500	12	0,75	5,4	34	160	8	100	Single Ended	GX4001	35	2000	11	2,4	60	14,5	13	1,1	7,5	Sing	le Ended
LB2301	125	500	18	0,48	5	15	70	1,4	25	Push - Pull	GX4002	70	2000	11	0,9	55	26	26	2,2	15	Sing	le Ended
LR2301	125	500	18	0,48	5	15	70	1,4	25	Push - Pull												
LB401	130	500	14	0,75	2,7	17	80	4	50	Push - Pull	GaN				FLANGI	ED MC	UNT				28	3 VOLT
LR401	130	500	14	0,75	2,7	17	80	4	50	Push - Pull		Pout	Freq	Gain	theta	eff	Idsat	Ciss	Crss	Coss		
LR501A	175	500	13	0,44	4,8	30	150	7,5	100	Push - Pull	Part No											Style
LB501A	175	500	13	0,44	4,8	30	150	7,5	100	Push - Pull		W	Mhz	dB	јс	%	Α	pf	pf	pf		
LA2541	200	500	16	0,38	7,5	21	122	2	45	Push - Pull	GP1441	10	2500	11	5,45	35	2,2	3	0,15	1,5	Sing	le Ended
LS2541	200	500	16	0,38	7,5	21	122	2	45	Push - Pull	G21441	10	2500	11	5,45	35	2,2	3	0,15	1,5	Sing	le Ended
LR2401	175	500	16	0,48	7	24	110	1,8	40	Push - Pull	GP2441	40	2500	11	4,2	55	6,8	7,2	0,37	3,5	Sing	le Ended
LR2501	200	500	16	0,4	7,5	27	122	2,6	45	Push - Pull	GP3441	50	2500	11	3,6	55	8,5	10	0,45	6	Sing	le Ended
LR2541	200	500	16	0,4	7,5	21	122	2	45	Push - Pull	GX2441	50	2000	11	3.5	55	6.8	7.5	0.37	4	Sinc	lle Ended
LS2641	250	500	16	0,35	7,8	29	147	1,6	60	Push - Pull	CY7//1	80	2000	10	7	60	0 E	10	0.45		Sino	
LP801	15	1000	12	3,4	0,8	5,5	30	1	15	Single Ended	073441	80	2000	12	5	00	0,0	10	0,45	0	Sing	
LQ2001	20	1000	19	1,5	1	2,8	17	0,3	6	Push - Pull	GX4441	100	2000	12	2,4	60	13,5	13	0,8	7	Sing	le Ended
LQ801	30	1000	12	1,8	0,8	5,5	30	1	15	Push - Pull	GX3442	120	2000	11	1,8	55	17	20	0,9	12	Sing	le Ended
LK802	45	1000	12	1,1	1,6	11	60	2	30	Push - Pull	GX4442	160	2000	12	0,9	55	24	26	1,6	14	Sing	le Ended
LK2201	50	1000	17	1,2	2,8	7,5	40	0,8	15,2	Push - Pull												
LX401	60	1000	10	1,3	2,7	17	80	4	50	Single Ended	LDMOS				SURI	ACE	ΜΟυι	Т				28 VOLT
LX2401	80	1000	15	0,75	7	24	110	1,8	40	Single Ended	Part No	Pou	t Free	q Ga	in theta	gm	Idsa	at C	iss (of	Crss	Coss	Style
LB2401	125	1000	16	0,48	7	24	110	1,8	40	Push - Pull		70	500		5 JC		A 10	ŀ		p	pi 70	Single
LP601	7	1500	10	3,6	0,5	4	16	0,8	13	Single Ended	L870IPR	30	500) 13	2,5	1,6	10	6	50	1,6	30	Ended
											L2701	30	500) 13	1,8	1,6	10	e	50	1,6	30	Single Ended
													1504		7.0		,		C	0.0	17	Single
		C			POLYTER	2				0		7	1500		5,6	0,5	4		0	υ,ờ	15	Ended
	PO	LYFET	1	0	igota iti y	C.			POLYI SM40	ET 12P	L8801PR	13	1000	0 10	5	0,8	5,5	5 3	60	1	15	Single Ended
	0							(1003		L2801	15	1000	0 12	3,4	0,8	5,5	5 3	50	1	15	Single Ended





Ceramic Filters

Antennas



MAC TECHNOLOGIES

www.mactech.co.kr

COMPANY OVERVIEW

MAC technologies is a company that develops and produces varied selections of wireless communication components essential in this ever changing high tech era, based on its source technology.







CERAMIC FILTERS

- Low insertion loss for using high Q-value dielectric resonators
- Small and light for using high dielectric constant ceramics
- Excellent temperature stability for temperature
- Excellent mechanical stability without

MULTIPLEXER

- ► Various size & wide frequency
- ► Temperture compensated
- ► Low insertion loss
- Low cost & custom design
- High mechanical stability

DIELECTRIC DUPLEXER

- Low insertion loss for using high Q-value dielectric resonators
- Small and light for using high dielectric constant ceramics
- Excellent temperature stability for temperature
- Excellent mechanical stability without

- vibratile structure
- SMD and reflow soldering available
- Mountable by automatic placement machine

- vibratile structure
- ► SMD and reflow soldering available
- Mountable by automatic placement machine

QUADRIFILAR WIDE-BAND ANTENNA

- Wide-band responsibility
- Lighter than Ceramic Antennas
- Circular Polarization Antenna
- Provide highly stabilized performance
- Better multi recognition performance
- 900 MHz ISM Band (FCC, ETSI, KCC, CCC & etc.)



			QUADRIFILAR W	IDE-BAND ANTENNA	GAIN TABLI	E				
No.	Part No.	Antenna Weight (g)	Dimension (mm ²)	Frequency range(MHz)	Mea	surement l	Data (MAC	C technlo	gies Chambo	er)
				-	BandW	BeamW	Hor(dBiL)	Ver(dBiL)	RHCP(dBic)	AR(dB
				-	(-10dB)(MHz)	(-3dB)(Deg	-		AR(dB)	
1	MQWA45SH915-A	8	45x45x10		200 Тур.	110	-1.63	-0.66	27760	3.0 min
2	MQWA45SM915-A	9	45x45x15		200 Тур.	110	-0.51	0.65	34366	3.0 min
3	MQWA45SP915-A	19	45x45x18		200 Тур.	110	-0.40	0.75	45080	3.0 min
4	MQWA60F45SH915-A	11	60×60×10(F45×45)		200 Тур.	110	-1.25	-1.06	29221	3.0 min
5	MQWA60F45SM915-A	12	60×60×15(F45×45)	FCC ETSI KCC CCC &	200 Тур.	110	-0.08	0.21	3.00	3.0 min
6	MQWA60F45SP915-A	12	60×60×18(F45×45)	etc.	200 Тур.	110	-0.16	0.95	11383	3.0 min
7	MQWA60SH915-A	13	60×60×10		200 Тур.	100	0.33	0.10	45202	3.0 min
8	MQWA60SM915-A	14	60x60x15		200 Тур.	100	0.71	0.56	18323	3.0 min
9	MQWA79SH915-A	18	79×79×10(F60×60)		200 Тур.	100	0.32	0.06	43891	3.0 min
10	MQWA79SM915-A	19	79×79×15(F60×60)		200 Тур.	100	1.Eki	0.86	34029	3.0 min



	QUADRIFILAR WIDE-BAND RECOGNITION DISTANCE													
No.	Part No.	Dimension (mm ²)		Card Tag	(m)			Alien Ta	ag (m)					
			Tag(H)	Tag(V)	Best(H)	Best(V)	Tag(H)	Tag(V)	Best(H)	Best(V)				
1	MQWA45SH915-A	45x45x10	2.1	3.1	2.8	4.0	2.0	3.6	2.7	4.5				
2	MQWA45SM915-A	45x45x15	3.0	4.0	3.0	4.4	2.1	4.4	3.0	6.6				
3	MQMA45SP915-A	45x45x18	3.1	4.2	4.3	4.5	3.1	4.4	4.5	6.3				
4	MQWA60F45SH915-A	60×60×10(F45×45)	3.1	3.4	4.0	4.2	3.2	4.0	4.8	4.6				
5	MQWA60F45SM915-A	60×60×15(F45×45)	3.2	3.6	4.8	4.3	3.3	4.3	5.3	1.7				
6	MQMA60F45SP915-A	60×60×18(F45×45)	3.2	4.4	4.6	6.3	3.3	4.6	5.2	6.7				
7	MQWA60SH915-A	60x60x10	3.3	4.0	4.9	5.5	3.4	4.3	5.4	6.0				
8	MQWA60SM915-A	60x60x15	3.4	4.2	5.3	5.8	4.8	4.4	6.3	6.6				
9	MQWA79SH915-A	79×79×10(F60×60)	3.3	3.9	4.8	5.5	3.3	4.3	5.3	6.0				
10	MQWA79SM915-A	79×79×15(F60×60)	3.4	4.2	5.8	5.8	4.8	4.4	6.8	6.7				

• CERAMIC ANTENNA

- Circular Polarization Antenna
- 900 MHz ISM Band (FCC, ETSI, KCC, CCC & etc.)
- Antenna dimension is as small as Teflon antenna
- Using high quality factor dielectric
- Better multi recognition performance
- Provide highly stabilized performance



				CERAMIC AN	TENNA GAIN TABLE						
No.	Part No.	Ground Plane (mm)	Antenna Weight (g)	Dimension (mm ²)	Frequency range(MHz)	Measurement Data (MAC technlogies Chamber)					
					••••	BandW	BeamW	Hor(dBiL)	Ver(dBiL)	RHCP(dBic)	AR(dB
						10dB (MHz)	(-3dB)(Deg	-		AR(dB)	

1	MPAC18SA915P-TA	50x50	3	18.3x18.3x2		4 Тур.	125	-12.42	-12.01	-10.50	3.0 min
2	MPAC18SC915P-TA	50x50	7	18.3x18.3x4	-	5 Тур.	125	-9.81	-11.50	-8.77	3.0 min
3	MPAC24SA915P-TA	50x50	6	24.4x24.4x2		4 Typ.	120	-9.54	-8.85	-6.04	3.0 min
4	MPAC24SC915P-TA	50x50	12	24.4x24.4x4	FCC ETSI KCC CCC & etc.	5 Тур.	120	-6.00	-5.67	-2.77	3.0 min
5	MPAC34SA915P-TA	50x50	11	34x34x2		3 Тур.	120	-5.54	-4.46	-1.98	3.0 min
6	MPAC34SC915P-TA	50x50	21	34x34x4		4 Typ.	120	-1.47	-2.16	1.Kas	3.0 min
7	MPAC34SF915P-TA	50x50	37	34x34x7		5 Тур.	120	-0.70	-1.67	Oca.80	3.0 min

	CERAMIC ANTENNA RECOGNITION DISTANCE										
No.	Part No.	Ground Plane (mm)	Antenna Weight (g) Dimension (mm²)		Card Tag	(m)			Alien Ta	ıg (m)	
				Tag(H)	Tag(V)	Best(H)	Best(V)	Tag(H)	Tag(V)	Best(H)	Best(V)
1	MPAC18SA915P-TA	50x50	18.3x18.3x2	0.4	0.7	0.7	1.0	0.3	0.5	0.5	0.6
2	MPAC18SC915P-TA	50x50	18.3x18.3x4	0.6	0.9	0.9	1.2	0.5	0.6	0.7	0.8
3	MPAC24SA915P-TA	50x50	24.4x24.4x2	0.7	0.9	0.8	1.1	0.6	0.8	0.7	1.0
4	MPAC24SC915P-TA	50x50	24.4x24.4x4	1.1	1.3	1.4	1.6	0.8	1.0	1.1	1.4
5	MPAC34SA915P-TA	50x50	34x34x2	1.2	1.6	1.6	2.2	0.9	1.2	1.3	1.7
6	MPAC34SC915P-TA	50x50	34x34x4	1.2	1.6	1.6	2.2	0.9	1.2	1.3	1.7
7	MPAC34SF915P-TA	50x50	34x34x7	1.5	1.9	2.1	2.8	1.2	1.6	1.4	2.0
8	MPAC45SC915P-TA	78x78	45x45x4	1.7	2.2	4.1	4.4	1.6	2.2	4.1	4.4
9	MPAC45SF915P-TA	78x78	45x45x7	2.0	3.1	4.8	5.4	1.9	3.0	4.8	5.4
10	MPAC62SF915P-TA	78x78	61.5x61.5x7	2.4	3.4	5.7	6.0	2.4	3.4	5.7	6.0
11	MPAC79SE915P-TA	78x78	78.7x78.7x6.35	2.9	3.8	6.0	7.0	2.9	3.9	6.2	7.5





Frequency Solutions

RF Filters

REFERENCES

Northrop Grumman Corporation General Dynamics Corporation Lockheed Martin Corporation L3Harris Technologies Inc. Collins Aerospace MDA Corporation NEC Corporation Boeing Co ISRO



www.mtronpti.com

COMPANY OVERVIEW

MtronPTI has over 70 design wins on satellite platforms and manned spacecraft. From Engineering Design Units to Flight hardware, MtronPTI has a proven team and track record to meet your demanding space needs.

Supporting military, commercial, and scientific space applications, MtronPTI delivers qualified solutions which fully meet the reliability and performance demands of space.





CAPABILITIES

- ► In House Crystal Resonator Processing
- Ultra-Lightweight and Compact Solutions
- Corona Discharge Analysis / Testing
- ► High Power Handling
- ► High Channel to Channel Isolation
- Very Low Insertion Loss

PRODUCT LINES

- ► Crystal Filters to 200 MHz
- ► LC Filters to 6 GHz
- Cavity / Waveguide Filters to 20 GHz
- N-plexers
- Precision Resonators to 200 MHz

SPACE LEVEL IN HOUSE TESTING

- ► Thermal Shock per MIL-STD-202, Method 107
- ▶ Terminal Strength per MIL-STD-202, Method 211
- ▶ Mechanical Shock per MIL-STD-202, Method 213
- ▶ Gross Leak Testing per MIL-STD-202, Method 112
- Random Vibration per MIL-STD-202, Method 214A
- ► Fine Leak Testing Helium per MIL-STD-202, Method 112
- ▶ Sinusoidal Vibration per MIL-STD-202, Method 201 and 204
- ▶ PIND (Particle Impact Noise Detection) per MIL-STD-202, Method 217
- Other Miscellaneous Testing including: Life, Immersion, Barometric Pressure, Humidity, Solderability
- Dielectric withstanding voltage, Insulation Resistance

WORKMANSHIP STANDARTS

- In-House J-STD-001 Certified Trainer
- ► J-STD-001 Class 3 with Space
- Addendum

PRODUCTION CAPABILITIES

- Dedicated Clean Room
 World-class FOD Control
- In House Crystal Processing Internal Quartz Sweeping Laser Weld

FULL DC and RF TESTING

- Crystal Filters to 200 MHz
- ► LC Filters to 6 GHz
- ► Cavity / Waveguide Filters to 20 GHz
- N-plexers
- Precision Resonators to 200 MHz



RF Switches





www.menlomicro.com

COMPANY OVERVIEW

The leading innovator in RF MEMS switch design and fabrication, Menlo Micro has lifted these limitations by developing unique materials, designs, and processing techniques to create the Ideal Switch. Menlo Micro's Ideal Switch platform is a game-changer. It has the potential to serve multiple industries, including next generation 5G mobile networks, industrial IoT markets, battery management, homeautomation, electronic vehicles, and medical instrumentation.

Introducing the Ideal Switch

Technology platform with breakthrough innovations in materials and processing.

• Ideal Switch

Unique Glass Packaging

- Better thermals & better power handling, improved RF performance
- Highly Reliable
- >3B cycles spec, w/roadmap to >20B
- High power capability
- Through-Glass-Via
- Lower parasitics, lower resistance, small size package, lowest cost
- Simple & Scalable
- Simple design lets us go very small (50 μ mx50 μ m unit cell)
- Small size allows easy scaling for high power through massive switch arrays
- Scalable & Versatile



- Small size easy to scale costs down with production volume
- Standard Process Design Kit to create many products
- Short design cycles faster time to market

Beneath the Glass

Combining semiconductor manufacturing with a micro-mechanical actuator, the Ideal Switch air-gap achieves practically infinite isolation when OFF, and close to Zero Ω when ON. This combination creates the unique properties of the Ideal Switch:



Superport Mode

- Bypass the RFC connection, connect any of the remaining 4 channels to any other channel
- Creates a SPST, SPDT, or SP3T with improved broadband performance out to 26GHz





		PRODUCT PORTFOLIO			
	Products	Specs	Markets	Apps	
	5130	SP4T, 25W/channel DC-26GHz, 0.3dB IL@6GHz 2.5 mm x 2.5 mm WL-CSP			
RF/MICROWAVE SWITCHING	3100 MEMS	(6) SPST, 25W/channel DC-3GHz, 0.35dB IL@3GHz embedded SPI controller 6 mm x 6 mm BGA	 Aerospace & Defense Scientific/Medical Wireless Infrastructure Test & Measurement 	 Tunable filters Switched filters PA impedance matching Beam steering antenna 	
	5120 MEMS	SP4T, 25W/channel DC-12GHz, 0.35dB IL@6GHz embedded Vboost controller 4mm x 4 mm BGA	-		
	5600 MEMS	DPDT, 40Gbps, differential mux embedded SPI, ESD 8 mm x 8 mm LGA	• Test & Measurement	 High-speed data bus testing, semi test RF EM relay replacement 	
GENERAL PURPOSE SWITCHING	1200 MEMS	(6) 150V/1A SPST relays isolation > 45dB, <1Ω Ron embedded SPI controller 6 mm x 6 mm BGA	 Test & Measurement Scientific/Medical 	 EM relay replacement Impedance matching High-density, LF switch matrices, multiplexers 	
		(1) SPST power relay (proto) 120V/10A AC/ DC 20µs switching @ 0.04Ω Ron 6.4 cm x 5 cm proto board	 Home, Industrial Automation, Lighting Battery Mgmt, Charging Solar, EV 	 General purpose AC/DC Power Relay EMR and SSR replacement 	
SMART POWER SWITCHING	9200	400V/10A AC/DC SPST power die Ron 10mΩ 5 mm x 5 mm WL-CSP			



Crystals & Oscillators





www.statek.com

COMPANY OVERVIEW

For over 50 years, we have supported military programs with state-of-the-art crystal resonators and oscillators. We offer a complete portfolio of frequency control products manufactured and tested to military standards: oscillators to MIL-PRF-55310 Product Level B and crystals to MIL-PRF-3098. Our dedicated servicing of the demanding requirements of the military market makes us a preferred supplier to most major defense contractors.

• Military Product Features

- Extreme high shock survivability (highest in the industry)
- Ultra-miniature and low-profile packaging
- Excellent long-term aging
- Full product traceability
- Extended temperature ranges (-55°C to 225°C)

• Surface Mount Quartz Crystals Key Features:

- Ultra-Miniature
- Frequencies from 10 kHz to 250 MHz
- Highest Shock Survivability in the Industry
- Tight Frequency Stability
- Low Acceleration Sensitivity
- High Reliability
- Excellent Long-Term Aging

PRODUCT	PACKAGE(MM)	FREQUENCY RANGE	
CX20	2.5 x 1.2	16 kHz to 32.768 kHz	۰
CX18	1.6 x 1.0	30 MHz to 100 MHz	۱
CX17	4.8 x 3.0	12 MHz to 200 MHz	
CX16	20x12	24 MHz to 100 MHz	
	2.0 × 1.2	32 kHz to 180 kHz	
	70.15	32 kHz to 240 kHz	
CXII	3.2 x 1.5	16 MHz to 250 MHz	
		16 MHz to 250 MHz	
CXIIL	3.2 x 1.5	(Telemetry Crystal)	
CXIILHG High Shock	3.2 x 1.5	16 MHz to 50 MHz	Jan 1997 - 1997
СХ9НТ		32 kHz to 160 kHz	
High Temperature	4.1 X 1.5	14 MHz to 250 MHz	
		30 kHz to 250 kHz	
CX4	5.0 x 1.8	600 kHz to 1.4 MHz	
		14 MHz to 250 MHz	
CX4HG High Shock	5.0 x 1.8	14 MHz to 50 MHz	
		30 kHz to 250 kHz	
CX4HI High Temperature	5.0 x 1.8	600 kHz to 2.5 MHz	
		14 MHz to 250 MHz	
		10 kHz to 600 kHz	
CX1	8.0 x 3.6	530 kHz to 2.1 MHz	
		6 MHz to 250 MHz	
CX41HG High Shock	8.0 x 3.6	6 MHz to 250 MHz	
CXIHT High Shock	8.0 x 3.6	6 MHz to 250 MHz	
SWCXI Sweep Quartz	8.0 x 3.6	6 MHz to 250 MHz	

Sweep Quartz



Crystals & Oscillators

EURO QUARTZ



www.euroquartz.co.uk

COMPANY OVERVIEW

For over 50 years, we have supported military programs with state-of-the-art crystal resonators and oscillators. We offer a complete portfolio of frequency control products manufactured and tested to military standards: oscillators to MIL-PRF-55310 Product Level B and crystals to MIL-PRF-3098. Our dedicated servicing of the demanding requirements of the military market makes us a preferred supplier to most major defense contractors.

• Low Current Applications Standard

CLOCKS		HM P Group - Reduces Electromagnetic Interference		
		Frequency Range	8 – 165MHz	
Standard Clo	ock Oscillator – Ultra Low Current	Supply Voltage	10mA - 44mA (Typical)	
Frequency Range	156kHz – 160MH	Current Consumption	-1% Ctre ±0.5%	
Supply Voltage	1V /2.5V and 3.3V	Package Sizes	7x5mm and 5x32mm	
Current Consumption	1.1mA – 5.0mA			
Package Sizes 7x5 mm		HM B Group - Reduces Electromagnetic Interference		
	_		3.0 – 200MHz	
Real tim	XOA Series - e clock and precision timing	Supply Voltage	-1.0% Ctre ±3.0%	
Current Consumption	32µA - 36µA	Current Consumption	10 -25mA Typical	
Frequencies	27.3kHz – 100kHz	Package Sizes	7x5mm and 5x3.2mm	
Package Sizes	3.2x2 /5x3.2mm/7x5mm			
	XOK Series -	 Differential Outp 	uts	

XOK Series -**Standard Clock Oscillator – Ultra Low Current**

Current Consumption	1.1mA – 5mA
Frequencies	156kHz – 160MHz
Package Sizes	5x3.2mm/7x5mm

TCXO - EME32T - Real time clock, GPS and Smart metering			
Current Consumption	1.5μΑ		
Frequencies	32.768kHz		
Package Sizes	3.2x2.5mm		

• Differential Outputs

LVPECL VCXO'S

GPQF Series - Differential LVPECL Output VCXO

Frequency Range	10 – 1500MHz
Pulling Range	±90ppm min
Current consumption	16mA Typical
Package Sizes	7x5mm

GPQN Series - Differential LVPECL Output VCXO

Frequency Range	8 – 165MHz
Supply Voltage	10mA - 44mA (Typical)
Current Consumption	-1% Ctre ±0.5%
Package Sizes	Package Sizes 7x5mm and 5x3.2mm

• Low EMI Applications Standard

SPREAD SPECTRUM

HM R Group - Reduces Electromagnetic Interference

Frequency Range	3.5 – 165MHz
Spread Down	-0.5% Ctre-±0.25
Current consumption	10mA - 35mA (Typical)
Package Sizes	7x5mm and 5x3.2mm

HM Y Group - Reduces Electromagnetic Interference

Frequency Range	8 – 165MHz	
Supply Voltage	10mA - 44mA (Typical)	
Current Consumption	-1% Ctre ±0.5%	
Package Sizes	Package Sizes 7x5mm and 5x3.2mm	

LVDS VCXO

Differential LVDS VCXO	
Frequency Range	10.0 – 1450MHz
Integrated Jitter	0.2nS Typical
Current consumption	25mA Typical
Package Sizes	7x5 , 5x3.2 and 3.2x2.5

Differential LVDS VCXO		
Frequency Range	10.0 – 1450MHz	
Pulling Range	100ppm Min	
Current consumption	16mA Typical	
Package Sizes	7x5, 5x3.2 and 3.2x2.5	

Voltage Controlled

VCXO SERIES	
G Series - Voltage Controlled Oscillator CMOS Output	
1.0 – 50.0MHz	
±80ppm Min	
1.0pS Max	
7x5/ 5x3.2/3x2.2 mm	

GTQF Series - Voltage Controlled Oscillator CMOS Output

Frequency Range	10 – 245.0MHz
Pulling Range	±90ppm Min
Phase Jitter	0.9pS Typical
Package Sizes	7x5and 5x3.2mm

GTQN Series - Voltage Controlled Oscillator CMOS Output	
Frequency Range 10 – 245.0MHz	
Pulling Range	±90ppm Min
Phase Jitter	0.6pS Typical
Package Sizes	7x5and 5x3.2mm

GPQN Series - Voltage Controlled Oscillator - PECL Output

Frequency Range	10MHz – 1450.0MHz
Pulling Range	±90 - 200ppm
Phase Jitter	0.6pS Typical







HDQF Series - Differential LVDS Output Waveform

Frequency Range	10 – 1450MHz
Integrated Jitter	0.9pS Typical
Current consumption	16mA Typical
Package Sizes	7x5,5x3.2

GDQF Series - Voltage Controlled Oscillator - LVDS Output

10MHz – 1450.0MHz

7x5 and 5x3.2mm

±100ppm

1.2 pS Typical

• Differential Outputs

LVDS CLOCKS	
HDQN Series - Differential LVDS Output Waveform	
Frequency Range	10 – 1450MHz
Integrated Jitter	0.6pS Typical
Current consumption	15mA – 31mA
Package Sizes	7x5 , 5x3.2

HCK Series - Non-PLL Differential LVDS Output Waveform

Frequency Range	13.50 – 220MHz
Integrated Jitter	0.2pS Typical
Current consumption	25mA Typical
Package Sizes	7x5 , 5x3.2 and 3.2x2.5

GDQN Series - Voltage Controlled Oscillator – LVDS Output		
Frequency Range 10MHz – 1450.0MHz		
Pulling Range	±100ppm	
Phase Jitter	0.6pS Typical	
Package Sizes 7x5 and 5x3.2mm		

• Differential Outputs

Frequency Range

Pulling Range

Package Sizes

Phase Jitter

LVDS CLOCKS

HDK Series - Differential LVDS Output Waveform

Frequency Range	10 – 220MHz
Integrated Jitter	0.2pS Typical
Current consumption	16mA Typical
Package Sizes	7x5 , 5x3.2 and 3.2x2.5

• Military & Aerospace

1000BM Series - 14 pin DIL Clock CMOS

Frequency Range	10MHz – 40MHz
Input Voltage	3.3V/5V
Stability	±50ppm
Current Concumption	$10 \approx 70 \text{ m}$

75000 BM Series - 7x5mm smd Clock CMOS

Frequency Range	1MHz – 60MHz
Input Voltage	1.8V ~ 5V
Stability	±50 ~ ±100ppm
Current Consumption	7mA max (15pF)

STXO Series - 3.2x2.5mm High Shock smd Clock

Frequency Range	10MHz – 80MHz
Input Voltage	3.3V/5V
Current Consumption	3mA max
Phase Noise	-163 dBc/Hz

CXOLHG Series - 3.2x2.5mm High Shock smd Clock			
Frequency Range	10MHz – 80MHz		
Input Voltage	2.5V/3V/3.3V		
Current Consumption	3mA max		
Phase Noise	-163 dBc/Hz		



Isalators, Circulators





www.rf-ci.com

COMPANY OVERVIEW

RF Circulator Isolator, Inc. (RFCI) was incorporated in September 2012. RFCI acquired CIPL (Circulator/Isolator Product Line) business from RFMD, when RFMD decided to exit the CI business. Management, engineering team, support group, and oversea manufacturing were transferred intact to RFCI.

• Product Features

- Broad selection of frequency and Bandwidth (48MHz to 20GHz, narrow to 100% Bandwidth)
- High Reliability performance
- High Peak and CW Power Handling capability
- Wide Operation Temperature Range
- Communication Base Station Bands with excellent IMD performance
- Broadband width, Octave and Octave-plus Bandwidth
- Robust Construction
- Standards and Miniature package size
- Magnetically Shield
- RoHS Compliant
- No beryllium Oxide
- Clockwise (CW) and Counter-Clockwise rotation (CCW)
- Reflected power from 1 Watt to 200 Watts pending on Model Number (contact factory) for your particular requirement

DROP-IN CIRCULATORS / ISOLATORS



Single Drop-in Circulator,

Communication Bands

from 300MHz to 18 GHz



Single Drop-in Isolator (5W to 200W Power Handling) from 300MHz to 10 GHz



Dual Drop-in Isolator (5W to 150W Power Handling) from 300MHz to 10 GHz

Drop-in Iso-Attenuator

(100W with 20dB, 30dB)

from 700MHz to 4 GHz



Broadband, Octave Band Circulator/ Isolator from 500MHz to 20 GHz

to 20 GHz

COAXIAL CIRCULATORS / ISOLATORS



300MHz to 10 GHz

SMD CIRCULATORS/ ISOLATORS





SMD Circulator from 700MHz to 3800 MHz

3 Ports Circulate

SMD Isolator (10 W to 100W Power Handling) from 700MHz to 3800 MHz

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SMD CIRCULATORS/ ISOLATORS



Coaxial Type N, SMA Circulator/Isolator (50W to 100W Power Handling) from 49MHz to 174 MHz Drop-in Circulator/ Isolator (50W to 100W Power Handling) from 49MHz to 174 MHz

DROP-IN FLANCE MOUNT DEVICESingle JunctionDual JunctionImage: Device of the second second



Single Junction





WEI BO

www.weiboassociates.com.hk

COMPANY OVERVIEW

Wei Bo Associates HK, Ltd. is a privately held, Hong Kong registered company, founded in 2014.Offer cutting edge, world class RF & Microwave products from the comfortable confines of the world's most customer friendly business environment.





RF SWITCHES								
Part Number	Freq Range (GHz)	Switch Topology	Tx Average Power (CW) (dBm)	Tx Peak Power (dBm)	Tx - Ant Insertion Loss (dB)	Return Loss (dB)	ISO (dB)	IP3 (dBm)
MSW2T-020522-232	0.02 - 0.52	SP2T, symmetrical	60	60	0.7	15	40	65
MSW2T-2000-199	0.05 - 1.0	SP2T, asymmetrical	50	50	0.15	23	52	65
MSW2T-2001-199	0.4 - 4.0	SP2T, asymmetrical	50	50	0.3	17	46	65
MSW2T-2002-199	2.0 - 6.0	SP2T, asymmetrical	50	50	0.6	13	34	65
MSW2T-2030-192	0.05 - 1.0	SP2T, symmetrical	50	57	0.3	22	52	65
MSW2T-2031-192	0.4 - 4.0	SP2T, symmetrical	50	57	0.5	15	35	65
MSW2T-2032-192	2.0 - 6.0	SP2T, symmetrical	50	57	0.6	13	35	65
MSW2T-2040-193	0.05 - 4.0	SP2T, symmetrical	52	57	0.5	20	42	65
MSW2T-2040X-198	0.1 - 2.0	SP2T, symmetrical	56	60	0.25	15	45	65
MSW2T-2041-193	0.4 - 4.0	SP2T, symmetrical	52	57	0.7	20	30	65
MSW2T-2050-194	0.05 - 1.0	SP2T, asymmetrical	52	58	0.15	20	50	65
MSW2T-2051-194	0.4 - 4.0	SP2T, asymmetrical	52	58	0.3	17	34	65
MSW2T-2060-195	0.02 - 1.2	SP2T, symmetrical	50	57	0.25	23	53	65
MSW2T-2061-195	0.02 - 2.0	SP2T, symmetrical	50	57	0.25	13	40	65
MSW2T-2062-195	1.5 - 6.5	SP2T, symmetrical	50	57	0.7	13	34	65
MSW2T-0025-195	1.0 - 2.0	SP2T, asymmetrical	50	57	0.3	15	20/15	65
MSW2T-2022-191	0.05 - 1.0	SP2T, asymmetrical	52	57	0.2	20	40/23	65
MSW2T-2735-196	2.7 - 3.5	SP2T, asymmetrical-CW	57	60	0.4	16	37	65
MSW2T-8512-740	8.5 - 12.0	SP2T, symmetrical	50	53	0.75	15	35	65
MSW3T-3100-209	0.05 - 1.0	SP3T, symmetrical	50	53	0.4	20	53	65
MSW3T-3101-209	0.2 - 4.0	SP3T, symmetrical	50	53	0.6	15	34	65
MSW3T-3200-150	0.05 - 3.0	SP3T, symmetrical	50	53	0.4	15	30	65
MSW3T-402103-332	0.4 - 1.0	SP3T, symmetrical	53	59	1.0	15	30	65
MSW5T-0310-505	0.03 - 1.0	SP5T, symmetrical	50	53	0.5	15	30	65
MSW6T-6000-600	0.03 - 0.5	SP6T, symmetrical	53	57	0.5	15	25	65
MSW6T-6100-600	0.002 - 0.03	SP6T, symmetrical	53	53	0.25	15	40	65
MSW6T-6040-600	0.03 - 0.5	SP6T, symmetrical	56	58	0.5	15	25	60



Solid State Power Amplifiers

AmpliVisionS

AMPLIVISIONS

www.amplivisions.com

COMPANY OVERVIEW

AmpliVisionS is a high-new technology enterprise. AmpliVisionS design, develop and manufacture RF&Microwave products for commercial, defence and industrial systems.

The main Product line includes Broadband Power Amplifier module, Pulsed Power Amplifier module, Rack-mount Amplifier subsystem. According to requests of customer, AmpliVisionS develops wide range of RF&Microwave products from 1.5MHz to 60GHz.



AMPLIFIER MODULES UP TO 6 GHz					
Model No.	Start (MHz)	Stop (MHz)	Pout (Watt)	Power Gain (dB)	Size (mm)
AVBR00205H53	20	520	200	53	180*120*25

AVBR00210H49	20	1000	80	50	150*90*25
AVBR00810H49	80	1000	80	50	150*90*25
AVBR0727H47	700	2700	50	48	162x86x25
AVBR0727H50	700	2700	100	50	180x140x25
AVBR0830H47	800	3000	50	48	162x86x25
AVBR1060H47	1000	6000	50	47	170*165*25
AVBR1060H50	1000	6000	100	50	240*240*25
AVBR2060H45	2000	6000	30	45	160*120*25
AVBR2060H47	2000	6000	50	47	170*165*25
AVBR2060H50	2000	6000	100	50	240*300*27
AVBR2560H47	2500	6000	50	48	140*120*23

AMPLIFIER MODULES & SUBSYSTEMS UP TO 18 GHz

Model No.	Start (GHz)	Stop (GHz)	Pout (Watt)	Power Gain (dB)	Size (mm)
AVBR20180H41	2	18	15	41	160*140*25
AVBR40190H40	4	19	10	40	160*140*25
AVBR60180H46	6	18	40	57	160*120*22
AVBR60180H50	6	18	100	50	340*340*40
AVBR60180U50	6	18	100	50	483 x 221 x 560 (5U)

AMPLIFIER MODULES UP TO 40 GHZ					
AVBR180270H37	18	26,5	5	37	160*120*27
AVBR180270H50	18	27	100	50	300x280x35
AVBR230300H35	23	30	3	35	160*120*27
AVBR260400H36	26,5	40	4	36	160*120*27
AVBR260400H37	26,5	40	5	37	160*120*27
AVBR270300H50	27	30	100	50	300x280x35



RF Connectors, Cables & Assemblies

Connectorized RF Components

KONNECT RF

www.konnectrf.com

COMPANY OVERVIEW

Konnect RF can provide lower-cost alternatives for almost any part in the industry. Whether you need domestically manufactured mil-spec equivalents or you can use high-quality internationally produced parts, they can save you money and grow your bottom line.

- Founded 2010
- Located in Southeast Florida
- Over 600 customers Worldwide
- Supplying Coaxial Connectors, Adapters, Cable Assemblies and Passive Components
- Global Network of Contract Manufacturers
- All products inspected, packaged, and warehoused in USA
- Rapid and Cost Effective development of
- custom products

Connectors



Coaxial cable connectors, PC board receptacles, standard receptacles, field replaceable receptacles, cable terminations.

Adapters



• Cable Assemblies



• RF & Microwave Components



Circulators & isolators, DC blocks, dust caps, power dividers, waveguide products, attenuators



RF Connectors, Cables & Assemblies

Connectorized RF Components

ROSENBERGER

www.rosenberger.com

COMPANY OVERVIEW

For more than half a century, the name Rosenberger has been associated with the most advanced technology, quality and creativity. Rosenberger is a world-wide leading manufacturer of connector solutions in the high-frequency and fiber optic technology fields.



AeroSpace & Defense

Rosenberger is a qualified manufacturer according to

- DIN EN 9100
- ESCC
- MIL-PRF 39012



• ESCC Space Qualified Products

Nearly all Rosenberger products can be qualified for space application (e.g. acc. to MIL-PRF-39012)

B2B and Board-to-Cable Connections

Rosenberger provides a wide range of RF coaxial connectors for PCB applications.

Features

Small board-to-board distances ٠

Portfolio

- Cable assemblies ٠
- Board-to-board connections ٠
- Board-to-cable connections ٠



• RF Coaxial Products

- The Rosenberger product range covers RF connectors, components and • accessories and cable assemblies
- Portfolio Standard Series ٠
- SMP, Longwipe SMP, P-SMP, SMP Infinity, Mini-SMP, FMC, MCX, SMA, QMA, ٠ SMB, 1.0-2.3, 1.6-5.6, Inserts (Mini-Coax D-Sub), BNC, TNC, UHF, Mini-UHF, N, QN, SnapN, 7-16, 4.3-10, NEX10™)
- Surface mount connectors ٠
- Reverse polarity connectors ٠
- RF test switches ٠
- Adaptors ٠
- In-series adaptors ٠
- Between-series adaptors ٠
- Tools ٠
- Crimping tools, crimp inserts ٠
- Stripping tools ٠

- Equalization of radial and axial misalignments ٠
- Different holding forces ٠
- Fast and cost-effective assembly design ٠









Micro-RF

EIC - Elastic Board-to-Board Connection

• Test & Measurement Portfolio







Coaxial Calibration Kits

Microwave Test Cables

VNA Test Port Cables















Precision Adaptors





















• SMP Infinity

Mechanical specification

- Reliable connection, low insertion force (≤ 45N, like SMP limited detent)
- Locking sleeve: retention force up to 400 N
- One piece connector with pre-assembled inner conductor
- Not intermateable with SMP

Electrical specification

- ◆ Return loss ≥ 25 dB DC-30 GHz for cable HFE100D (tbc)
- ◆ Insertion loss typical 0,05 x√f(Ghz) (tbc)
- RF leakage (-92dB @ 18 GHz) (tbc)

Planned variants

- Straight and right angle connectors
- Cable connectors for different cables
- PCB connectors (pin in paste, solder pin, SMD, rear mount)
- Bulkhead connectors



• Micro RF

+ Height 1,5 mm



• Long-Wipe SMP

Frequency range	:	- 6 GHz
Power handling	:	100 W @ 2,2 GHz
Board to Board distance	:	min. 9.35 mm
Axial misalignment	:	+/-0.7mm
Radial misalignment	:	4°



• P-SMP High Power

- Frequency range up to 10 GHZ
- Power handling up to 200W @ 2.2GHz
- Board to board distance min. 12.6 mm
- Axial misalignment +/-1mm
- Radial misalignment 4°
- Right angle connectors for cable application

- Space on PCB (1,8 x 1,9) mm
- Designed for DC to 6 Ghz
- Impedance 50 Ω
- Height switch + cable connector < 2.7mm
- EMI Shielding: > 40 dB up to 3 GHz

> 35 dB up to 6 GHz

• Mating cycles > 10000

• SMP

Frequency range	:	- 40 GHz
Power handling	:	65W @ 2.2 GHz
Board to Board distance (min)	:	9.05 mm
Axial misalignment	:	+/-0.3mm
Radial misalignment	:	4°
Disengagement forces	:	
Full detent	:	>22N
Limited Detent	:	>9N
Smooth bore	:	>2.2N

• Rosenberger Non-Magnetic Products

- MRI (Magnetic Resonance Imaging) equipment
- The aerospace industry
- Industrial applications

Features

- Frequency range DC to 18 GHz
- Current rating typical 2 A
- Data rates up to 10 Gbps
- Tolerance compensation > 0.6 mm
- High number of mating cycles up to > 100,000

PCB Connections

- Modular connector systems for DC frequencies up to 50 GHz
- Solderless PCB mount connectors for ultra-high frequency up to 110 GHz
- Spring-loaded coax systems (> 2,500 matings, pairwise phase matching 10 ps standard)

Applications

- High volume industrial production of high end PCB up to 50 GHz
- Applications with different interfaces on one board
- Applications with repair friendly products
- Applications where maintenance is important





Modular Connector Systems



Spring-Loaded Coax

Solderless PCB Connectors



RF-PCB Connectors

Micro-RF Non-Magnetic Products



Low Loss High Frequency Coax Cables



INCORPORATED

www.iw-microwave.com

COMPANY OVERVIEW

Founded in 1970, IW developed a unique PTFE lamination process and applied it to manufacturing wire and cable. This process allowed IW to manufacture products of unprecedented reliability along with smaller diameters, from .050" to 0.500".

- Phase matching, amplitude matching, and time delay measurements up to 67 GHz are available when required.
- All assemblies are tested for VSWR and insertion loss before leaving the factory
- High Power cables:
 2801 up to 1.9KW (c.w) @ 2 GHz
 4806 up to 3.2KW (c.w) @ 1 GHz
 customer proven to 15KW at 13.56MHz
 7506 theoretical 5KW (c.w) @ 1 GHz
- 75ohm cables: 2801/75, 1801/75, 1151/75
- Low loss phase stable dielectric: 1571 cable 64dB/100ft. @ 40 GHz 4dB/100ft. less than Micro Coax

115 GPO/GPPO, 1.85mm (V[™]), 2.4mm, 2.92mm (K[™])



*Connector types listed are preferred matching for referenced cables. Additional connector types can be provided. Please consult factory.



CABLE ASSEMBLIES

METRIC PART NUMBER



Note: Metric part number format is X.XX meters - 300M defines a 3m length assembly; a 10m assembly part number with the same connectors as shown above is SPR-2301A-1000M-SPS



• Custom Solutions

In addition to our internally ruggedized cables, IW has a wide range of materials and processes designed to protect the integrity of our cable assemblies. These include a variety of metallic and non-metallic external sheaths to address your specific application. Please contact us for details.

1	ZEL	Tefzel Jacket
2	LC	Low Smoke/ Zero Halogen Polyurethane
3	NX	Fire resistant NOMEX* braid *Nomex is a registered trademark of the DuPont Corporation
4	Α	Interlocked stainless steel armor, crush resistant up to 400 lbs per linear inch
5	Ν	Neoprene weather proof jacket
6	ALC	Armor with extruded Polyurethane jacket

• Re-Flex

To provide improved electrical and mechanical performance over traditional hand-formable designs, Insulated Wire presents **Re-Flex™.**

Both RF085 and RF141 are industry standard line sizes, consequently a wide range of connector types and styles can be used with these cables, including: SMA, TNC, N, GPO[™], GPPO[™], **2.92mm/K[™], 2.4mm and 1.85mm/V[™],** with performance up to 60GHz. **RF250** is commonly used for higher power applications with SMA, TNC, N, SC and HN connectors available.

Cable part numbers are TPRFEP085, TPRFEP141 and TPRFEP250.



ATTENUATION (DB/FT., MAX)

BEND RADIUS (INCH)

		10 GHZ	18 GHZ	32 GHZ	60 GHZ		
RF085	62 GHz	0.60	0.91	1.28	2.01	0.125	RG405
RF141	32 GHz	0.41	0.60	0.88	-	0.250	RG402
RF250	19.5 GHz	0.29	0.44	-	-	0.375	RG401



Waveguide Solutions



www.almicrowave.com

A1 Microwave

COMPANY OVERVIEW

Al Microwave was founded in 2001 in United Kingdom, and is a leading designer and manufacturer of passive RF and microwave components and sub-assemblies for satcoms, telecoms, defence, radar and scientific applications. Products and services are free from ITAR restrictions and many of our commercial off the shelf products (COTs) can be tailored to meet precise customer requirements.

The company acquired JMD Technologies in 2010 which had an established credibility in Precision Waveguide Component and Sub-Assembly production WG 6 (WR 650) to WG 22 (WR 28), and has been manufacturing since 1990. Al Microwave also provides build to print of precision waveguide components and sub-assemblies from WG6 (WR650) to WG22 (WR28). Al Microwave can supply specialist items to the Defence, Aerospace, Marine, Satellite Communications, Commercial and High Power segments of the markets.



RECEIVE FILTERS



TRANSMIT FILTERS



DIPLEXERS



ANTENNA FEEDS





CIRCULATOR HOUSINGS



TERMINATION HOUSINGS





< Water cooled High Pressure Water Cooled Stainless Steel Load Housing >



BENDS AND TWISTS



MAGIC TEES AND OMT'S



COMBINERS



GENERAL COMPONENTS



Since 2001 A1 Microwave's Filter division has brought high quality technically advanced microwave filtering products to the Satcom, Radar and Fixed Link communications markets.

Fast delivery and No NRE (on standard designs) is achieved by using sophisticated in-house design and simulation software, all new designs are "right first time" allowing the design to move from the design computer to the machine shop without the need for prototyping.

With in house CNC machining, turning, brazing, hard and soft soldering and bending facilities A1 Microwave can design or build to print a complete range of custom waveguide components and assemblies.



micro & nano d type and circular connectors





www.omnetics.com

COMPANY OVERVIEW

Omnetics is a world-class miniature connector design and manufacturing company with over 30 years of experience, focused on Micro-miniature and Nano-miniature highly reliable electronic connectors and interconnection systems. Our miniature connectors are designed and assembled in a single location at our plant in Minneapolis, Minnesota.



LATCHING NANO-D









and the second sec							
Surface Mount (AA)	Flex Mount	(FF) Straigh	nt Thru-Hole (DD)	Pre-Wired (WD)			
	LOW PROFILE MICRO-D						
Discrete Wired (WD)	Right Angle Thru-Hole (H1)	Right Angle Thru-Hole (R2)	Solder Cup (SS)	Straight Thru-Hole (S2)			

• Power and Signal Micro Hybrids: 10A, 5A, 3A



• Nano Coax Connectors

Omnetics Nano Coax contacts are available either in a Hybrid Micro-D or as a standalone contact... The standalone version provides optimal performance in one of the lowest form factors on the market. The Nano Coax contacts are designed to be terminated to a low-loss 29 AWG (.047") 50 coax cable. Cable-Cable: 20GHz / Edge Launch: 20GHz / Thru Hole: 10GHz





• Micro 360® Circular Connectors

Omnetics' Micro Circular Connector Series utilizes Omnetics' rugged and reliable Flex-Pin contact system, is spaced on 50 mil (1.27mm) centerlines, features a mated length of less than 12.4 mm, and is specified to MIL-DTL-83513.











Discrete Wired (WD)

Right Angle Thru-Hole (H1)

Right Angle Thru-Hole (R2)

Solder Cup (SS)

Straight Thru-Hole (S2)

• IP68 Nano Circulars

Omnetics' Micro Circular Connector Series utilizes Omnetics' rugged and reliable Flex-Pin contact system, is spaced on 50 mil (1.27mm) centerlines, features a mated length of less than 12.4 mm, and is specified to MIL-DTL-83513.









Full Keyed Breakaway (M)

Full Keyed Breakaway (F)

Ratcheting - RMCP

Ratcheting - RMCS

Micro Strip Connectors



Single row: pin count changes up to 48 Dual row: pin count changes up to 97 available with latch

• Nano Strip Connectors



2-60 positions for single row 2-48 for dual row

Polarized Nano Connector (PZN)

This configuration effectively polarizes the connector without the additional space required for guide pins. Termination options include: Pre-Wiring, Straight tail, Horizontal SMT, and Vertical SMT. Up to 24 positions.



• Capabilities

LATCHING NANO-D	EMI SHIELDING	CUSTOM HARNESSING	CUSTOM METAL SHELL



Expanded Beam Fiber Connectors





www.micropol.com

COMPANY OVERVIEW

Micropol manufactures and supplies cable systems with rugged, high-quality field cables that can cope with extreme temperatures. Lengths range from a few decimeters to up to several kilometers. We offer different types of expanded beam connectors, both for single-mode and multimode. Take for example our Falcon connector which is used for harsh military and aerospace environments. They are all hermaphroditic, and always connect correctly without any adapter needed.



• The Smallest and Lowest Loss Expanded Beam Connector On The Market - Falcon

MECHANICAL

Coupling Type: Hermaphroditic Compliant: 650 - 1650 nm Material: Hard anodized aluminum Alternative Material: Marine bronze & stainless steel Colour: Gray Durability: 3000 mating cycles Free Fall: 500 falls from 1,2 meters height Vibration: 5-500Hz, 0,75mm amplitude at 10 g Shaking: 390 m/S numbers of shakes 3x4000 Shock Pulse Lenght: 11ms, half sine at 35g Numbers of axis: 3 (x, y, z)

ENVIRONMENTAL

Operating Temperature: -550C to +850C, +1000C optional **Water Immersion:** 10 m water depth-mated **Air Pressure :** <25kPa -550C during 4h

Corrosion Resistance: 500h salt spray Flammability: DOD-STD-1678, method 5010

• Cable Reel



- Mounted on cable reel
- Split with fanout cable
- Insertion loss < 1,2 dB
- · Connector size: mini, junior, senior
- 15 000 000 bendings at 30 mm radius
- Operational temperature range from -400C to +850C
- Standard configuration up to 500 meters (can be adjusted
- according to specifications)
- Backpack Cable Drum

Cable





- 1–384 fiber
- Operating temperatur -55°C to +85°C
- Vertical installation
- High flex, up to 15 million bends
- Rodent resistant

MIL-PATCHCORD



- Operating temperature -55 to +85°C
- Connectors with metal outer body
- Cut resistant
- Higher spring load
- Standard and Tailor-made



• Test Kits

• Cable Monitor



Prevents information tapping, detects cable cut off and cable vibrations

- Detects cable cut-off
- Detects specific vibrations of the cable
- Detects specific vibrations of the cable

• Distribution Frames, Pigtails, Patchcords



- Insertion loss < 0.2dB
- Return Loss > -55 dB
- 2-384 fiber

• ODF Boxes

 Future proof Tailor-made Insertion loss < 0.2 dB Return loss > -55 dB (UPC) Return loss > -65 dB (APC) 2-384 fiber More fiber available on request

• Fan Out

	 Single mode/multi mode 2 4 8 12 16 24 FIBER
	 Standard lengths 1.6 or 2.4 m Customized lengths on request
test (Rugged fanout Insertion loss < 0.2 dB

 Return loss > -55 dB (UPC), > -65 dB (APC)
 Available in S12 color coding
3

Attenuator

 Metal ion doped fiber High-power light source durability Wavelength independence Attenuation levels ranging from 1 dB to 30 dB 1310 nm, 1550 nm, 1250–1625 nm and 1350/1550 nm dual wave lengths

• MTP/MTO

	 Data center approved Insertion loss (reference cable)<0.3 dB/channel Return loss > -65 dB (SM) High density 4–72 fiber MTP-MPO fanout MTP-MPO patch MTP-MPO jumper cable assembly
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• Custom Solutions





circular IP69 connectors

ODU www.odu.de

COMPANY OVERVIEW

ODU, founded in 1942, is one of the leading international suppliers of connection systems. Our company employs 1,650 people around the world. The group of companies has its headquarters in Mühldorf am Inn, Germany. ODU also has production sites in Romania, USA and China.

• ODU AMC®

	ODU AMC® BREAK-AWAY	ODU AMC® PUSH-PULL	ODU AMC® EASY-CLEAN	ODU AMC® HIGH-DENSITY	ODU THREADED CONNECTOR
Mating cycles	Up To 5,000	Up To 5,000	Up To 5,000	Up To 5,000	Up To 2,000
Locking principle	Break-Away	Push-Pull	Break-Away	Break-Away	Screw Locking
Coding options (mechanical)	Pin/Groove	Pin/Groove	Pin/Groove	Pin/Groove	Pin/Groove
Coding options (optical)	Dot Marking, Color Coding	Dot Marking, Color Coding	Dot Marking, Color Coding	Dot Marking, Color Coding	Color Coding
Max. number of contacts	37	55	19	27	26
Transmission options	Signal, Data, Power	Signal,Data, Power	Signal	Signal, Data	Signal, Data, Power
Available termination technologies	Solder, PCB	Solder, PCB	Solder, PCB	Solder, PCB	Solder, PCB

• ODU MINI-SNAP®



	ODU MINI-SNAP® PIN AND GROOVE CODING	ODU MINI-SNAP® HALF-SHELL CODING	ODU MINI-SNAP® CODING USING SPLIT INSULATORS
Mating cycles	> 5,000	> 5,000	> 5,000
Locking principle	Push-Pull	Push-Pull	Push-Pull
Coding options (mechanical)	Pin/Groove	Half-Shell	Insulator
Coding options (optical)	Dot Marking	Dot Marking	Dot Marking
Max. number of Contacts	40/30	27	10
Transmission options	Signal, Data, Power	Signal, Data, Power	Signal, Data
Available termination technologies	Solder, Crimp, PCB	Solder, Crimp, PCB	Solder, PCB
Max. IP protection in unmated condition	IP68	IP68	IP68
Max. IP protection in mated condition	IP50/IP68	IP68	IP68





> 500 AUTOCLAVING CYCLES²



TEMPERATURE RANGE -20 °C to +120 °C

Rear panel installation [screwtype]

TERMINATION TECHNOLOGY Print



• ODU MINI-SNAP Hermetic Sealing Receptacles

	G80L0Q- PU5RF00-00V0	G80L0Q- PU5QF00-00V0	G81L0Q- PD8RC00-00V0	G81L0Q- PD8QC00-00V0	G82L0Q- P16RC00-00V0	G82L0Q- P16QC00-00V0
ø Panel cut-out	9.1 mm + 0.1	9.1 mm + 0.1	12.1 mm + 0.1	12.1 mm + 0.1	15.1 mm + 0.1	15.1 mm + 0.1
Number of contacts	5	5	8	8	16	16
Contact style	Pin	Socket	Pin	Socket	Pin	Socket
He leakage rate acc. to DIN EN 60512-14-2:2006	Tested at < 10⁻º mbar l/s					
Insulator material		Glass + PEEK				
Data transfer protocol	USB	® 2.0 ¹	Etherne	t (CAT 5)	HDN	/ I® ¹
Data transfer rate	480 M	Mbit/s	1 Gk	bit/s	14.4 (Gbit/s
Single contact nominal current	4 A 3.8 A 4.2 A				2 A	
Nominal current insert	3	A	2.4	έA	2.1	A
Nominal voltage acc. to IEC 60664	10 V AC	7.5 V AC	32 V	/ AC	32 V	'AC

• ODU Circular Plastic Connectors



Coding Options (Optical)	Arrow marking, color coding	v marking, color coding Arrow marking	
Max. Number Of Contacts	26	27	6
Transmission Options	Signal, power, fluids (liquids and gases)	Signal	Signal
Available Termination Technologies	Solder, crimp, PCB	Solder, crimp, PCB	Solder
Max. IP Protection In Unmated Condition	IP68	IP50	IP50
Max. IP Protection In Mated Condition	IP64/ IP67	IP67	IP67

• Electrical Contacts









	ODU SPRINGTAC®	ODU LAMTAC®	ODU TURNTAC®	ODU SPRINGTAC® FLATSOCKET	
Primary Attribute	Attribute High mating cycles High temperature & current		Rugged	High mating cycles	
Contact Technology	Springwire technology	Lamella technology	Turned, slotted contacts	Springwire technology	
Reliability (Contact Points)	44 wire springs (size Ø 6 mm)	19 double contacting lamella louvres (size ø 6mm)	4 contact fingers (size Ø 6 mm)	30 wire springs (size ¤ 6.3 x 0.8 mm)	
Nominal Current	100 A (size Ø 6 mm)	115 A (size Ø 6 mm)	100 A (size Ø 6 mm)	27 A (size 🛛 6.3 x 0.8 mm)	
Angular Misalignment	+/- 1°	+/-]°	+/- 5° *		
Mating Cycles	> 100,000	> 10,000	> 10,000	> 50,000	
Temperature Range Standard Version	-40 °C to 125 °C	-40 °C to 150 °C	-40 °C to 125 °C	-40 °C to 125 °C	
Temperature Range High-Temp. Version		on request			
Contact Size	from Ø 0.76 mm	from Ø 1.5 mm	from Ø 1.5 mm	from = 0.64 x 0.64 mm	
Standard Plating	Ag / Au	Ag / Au	Ag / Au	Ag / Au	
Crimp Termination					
Screw Termination					
For Busbars (Through- Hole Design)					

*max. 5° misalignment in mounting position with corresponding design of the contact chamber.



Fiber Optic, Ethernet, Bus Cable Solutions





www.teldor.com

COMPANY OVERVIEW

TELDOR Cables & Systems Ltd. manufactures a wide range of wires and cables for telecommunications, electronics, and electricity, and is a leader in the design and production of high data-rate Copper and Optical LAN cables, Industrial BUS, Instrumentation and Control Cables.

The factory was established in 1966 at Kibbutz Ein-Dor, in Israel's Lower Galilee. TELDOR is a leading manufacturer in the development and production of advanced electronic, FiberOptic and data communication cables, as well as outside plant Telecom cables.

• Category Cable Data Center Solutions



Cat.5e, Cat.6, Cat.6A, Cat.7, Cat.7A solutions for data centers, patch cords and hybrid cables. Industrial Ethernet Outdoor Data Solutions.

Instrumentation Cable Solutions



Indoor and Outdoor Cables for the Process Industry, Petrochemical Industry, Unshielded and Shielded, Armored and Unarmored for Automation, Bus Cable and Hazardous Areas.

Signal & Control Cable Solutions



Instrumentation, Thermocouple, Bus Cables and Security Cables.

Optical Cable Solutions



Optical Cables for Indoor, Outdoor, Distribution, Breakout, Tactical and Jumper Applications. Rus Approved.

Military & Special Cable Solutions



Tactical Cables, Tailor-Made Cables with Special Armoring and Sheating Materials for Medical, Oil & Gas, Military and Special Applications with Different Conductor Sizes within the Cable; Composite or Hybrid Cable Design.



MARKET SEGMENTS



• Defence Line Overview

- Specialty cables (EPD, Custom Design)
- Tactical Fiber Optic cables
- Tactical Data (Category) cables
- Marine & Underwater Cable
- Hybrid and Composite cables
- Wires

• Armoring

- Long life cycle & high reliability
- Designed to fit system and operational
- needs
- Endurance in harsh environmental
- conditions
- Excellent mechanical properties
 - Galvanized Steel Wires (SWA)
 - Steel Braid Armor (SBA)
 - Corrugated Steel Armor
 - Copper Braid Armor
 - Bronze Wire Armor
 - Dielectric/Glass Armor

• Standards & Certifications

• MIL-DTL-24643

Low Smoke Zero Halogen Shipboard cable

• MIL-DTL-24640

Lightweight, Low Smoke, Electric Cables for Navy Shipboard Applications

• MIL-DTL-3432

Cables (Power and Special Purpose and Wire, Electrical (300 and 600 Volts)

• MIL-49291/3

Performance Specification: Fiber, Optical, General Specification

• MIL-PRF-85045

Performance Specification: Cables, Fiber Optics, General Specification including Tactical

• MIL-C-17

Cable, Radio Frequency, Coaxial

MIL-STD-810-F
 Test Method Standard for Environmental
 Engineering Considerations and
 Laboratory Tests

COMPUTER & LAN CABLES						
Bandwidth (MHz)	Application	Cat.	Standarts			
100	10/100 BaseT 1 GBaseT(1GbE)	5e	ISO/IEC 11801, IEC 61156-5/6. TIA/EIA 568B/C			
250	10/100 BaseT 1 GBaseT(1GbE)	6	ISO/IEC 11801, IEC 61156-5/6. TIA/EIA 568B/C			
500	10 GBaseT	6A	ISO/IEC 11801, IEC 61156-5/6, TIA/EIA 568C			
600	10 GBaseT ++	7	IEC 61156-5/6			
1000	10 GBaseT +++	7A	IEC 61156-5/6			
1200	Multiservice	N/A	IEC 61156-7/8			
2000	40GB/s	8	ISO/IEC 11801, IEC 61156-9/10, TIA/EIA 568C			



IMU/VRU/AHRS/GNSS&INS-RTK





www.movella.com

COMPANY OVERVIEW

Movella is the leading innovator in 3D motion tracking technology and products. Our sensor fusion technologies enable a seamless interaction between the physical and the digital world in consumer electronics devices and professional applications such as Motion Capture, Motion Analysis, healthcare, sports and industrial applications.



MTI-600 SERIES







Fully supported by the MT Software Suite (free use), enabling our customers a faster time to market

Small footprint, flexible mounting options

Industrial grade accuracy & reliability at affordable pricing, 100% calibrated and tested

Rich interface platform, incl. CAN bus support

External and internal GNSS-RTK receiver support

Advanced proprietary XKF3 core sensor fusion algorithms

State-Of-The-Art hardware components

Extensive technical support

RTK Solution

ITAR-free

Highest performance with resistance to magnetic distortions

Vibration-rejecting gyroscopes and accelerometers

Configurable output settings, synchronizes with any 3rd party device

MTI-G-710



All-in-one sensor system with high-frequency position and orientation output

Excellent heading tracking without requiring a magnetic field

Configurable output settings, synchronizes with any 3rd party device

	ROLL/PITCH STAT	IC ROLL/PITCH DYNAMIC	YAW	SENSOR FUSION CORE	POSITION & VELOCITY
MTi 1-series					
ΜΤΙ-Ι ΙΜυ	-	-	-	-	-
MTi-2 VRU	0.5°	0.8°	AHS	XKF	-
MTI-3 AHRS	0.5°	0.8°	2.0°	XKF	-
MTI-7 GNSS/INS	0.5°	0.5°	1.5°	XKF	1 m 0.05 m/s
MTi 600-series					
MTi-610 IMU	-	-	-	-	-
MTi-620 VRU	0.2°	0.5°	AHS	XKF	-
MTi-630 AHRS	0.2°	0.5°	1.0°	XKF	-
MTi-670 GNSS/INS	0.2°	0.5°	1.0°	XKF	1m 0.05m/s
MTI-680G RTK-GNSS/INS	0.2°	0.5°	1.0°	XKF	0.05m / 0.05m/s
MTi 10-series					
MTI-30 AHRS	0.2°	0.5°	1.0°	XKF	-
MTi 100-series					
MTi-100 IMU	-	-	-	-	-
MTi-200 VRU	0.2°	0.3°	AHS	XEE	-
MTi-300 AHRS	0.2°	0.3°	1.0°	XEE	-
MTi-G-710 GNSS/INS	0.2°	0.3°	0.8°	XEE	1 m 0.05 m/s



	REAL-TIME SENSOR FUSED DATA						
		IMU (1)	VRU (2)	AHRS (3)	GNSS/INS (7)	RTK-enabled GNSS / INS (8)	RTK-enabled VINS
		Intertial Measurement Unit	Vertical Reference Unit	Attitude and Heading Reference System	GNSS / GPS enabled Intertial Navigation System	Real Time Kinematics	Attitude and Heading Reference System
ø	Gyroscope	Roll	Roll	Roll	Roll	Roll	Roll
Ø	Accelerometer	Pitch	Pitch	Pitch	Pitch	Pitch	Pitch
۲	Magnetometer	Unref. Yaw	Unref. Yaw	Unref. Yaw	Unref. Yaw	Unref. Yaw	Unref. Yaw
0	Barometer 3D Position					<u>cm-level</u> 3D Position	3D Position
۲	GNSS Receiver				3D Velocity	3D Velocity	3D Velocity
					GNSS Time	GNSS Time	GNSS Time
) Cm	RTK Corrections						
6 0	Camera (B&W) & Wheel Odometry (External Source)					ead-reckoning	



IMU & GYRO



SAFRAN SENSING TECHNOLOGIES NORWAY

www.safran.com

COMPANY OVERVIEW

Safran operates its own wafer fabrication facility for production of the key sensor components in its products. Assembly, test and calibration are all in-house processes to secure the product performance. The tight integration between sensor fabrication, testing and assembly is what puts the company in a position to offer the highest performing sensors in the market.

Safran is a global leader in MEMS technology and has more than 30 years of experience developing and manufacturing reliable sensor solutions for demanding applications involving high vibration, high shock and harsh environments.



STIM210 is a small, tactical grade, affordable, robust and reliable, ultra high performance (Bias Stability 0.3°/h, ARW 0.15°/√h) MEMS gyro module with up to 3 axes. An integrated 32-bit microcontroller enables flexible user configuration. Electronic axis alignment is standard.

Miniature package

- ► ITAR free
- Excellent performance in vibration and shock
- Excellent environmental robustness
- 1, 2 or 3 axes offered in same package
- Electronically calibrated axis alignment
- ► RS422 interface
- ▶ 24 bits resolution
- Single-crystal silicon technology
- Low bias drift
- Low noise
- 5 different sampling rates available
- ▶ 5 different bandwidths available
- LP filter -3dB frequency can be set individually for each axis
- RS422 protocol, bit rate and line termination
- Selectable output unit: angular rate [deg/s] or incremental angle [deg]
- Continuous self-diagnostics.

STIM300 is a small, tactical grade, low weight, high performance non-GPS aided Inertial Measurement Unit (IMU). It contains 3 highly accurate MEMS

gyros, 3 high stability accelerometers and 3 inclinometers. The IMU is factory calibrated and compensated over its entire operating temperature

range.

STIM300 is a cost-effective ITAR free solution for systems that only had FOGs as an alternative when reaching for the performance level of that STIM300 can offer.

- Weight: <0,12 lbs (<55g)
- ▶ Volume: <2,2 cu. in. (35cm3)
- ► ITAR free
- Insensitive to magnetic fields
- ► Solid state high reliability
- ► Low gyro bias instability (0.3°/h)
- ► Continuous self-diagnostics
- Low gyro noise (0.15°/ \sqrt{h})
- ► ±10g acceleration input range
- Low accelerometer bias instability (0.05mg)
- ► 3 inclinometers for accurate leveling
- ► Compensated digital output, RS422
- Customer configurable output format, sampling rate and filter settings.

STIM318 is a small, tactical grade, low weight, high performance non-GPS aided Inertial Measurement Unit (IMU) with greatly improved

accelerometer performance. It contains 3 highly accurate MEMS gyros and 3 ultrahigh stability accelerometers. The IMU is factory calibrated and

compensated for temperature effects over its entire operating temperature range. STIM318 is a cost-effective ITAR free solution for systems that only had FOGs as an alternative when reaching for the performance level of that STIM318 can offer.

- ► ITAR free
- ► Low gyro bias instability (0.3°/h)
- Low gyro noise $(0.15^{\circ}/\sqrt{h})$
- Low accelerometer bias instability (0.003mg)
- Low accelerometer noise (0.015 m/s/ \sqrt{h})
- ▶ ±10g acceleration input range
- User programmable bias trim offset
- Customer configurable output format, sampling rate and filter settings
- ► Compensated digital output, RS422
- ► Continuous self-diagnostics
- ► Solid state high reliability
- Insensitive to magnetic fields
- ▶ Weight: <0,13 lbs (<57g)
- ▶ Volume: <2,2 cu. in. (35cm3)





STIM277H

STIM277H is a small, tactical grade, affordable, robust and reliable, ultra-high performance (Bias Stability 0.3°/h, ARW 0.15°/√h) MEMS gyro module with up to 3 axes built into a hermetic package. The package is a hermetic aluminum enclosure with a glass-to-metal sealed electrical micro-d connector and a laser-welded lid to secure long- term hermetic operation. All parts are tested for fine and gross leak to conform to MIL-STD-883J, Class H.

- Hermetic package
- ► ITAR free
- Excellent performance in vibration and shock
- Excellent environmental robustness
- 1, 2 or 3 axes offered in same package
- Electronically calibrated axis alignment
- ► RS422 interface
- ▶ 24 bits resolution
- Single-crystal silicon technology
- Low bias drift
- Low noise
- ► 5 different sampling rates available
- ► 5 different bandwidths available
- LP filter -3dB frequency can be set individually for each axis
- RS422 protocol, bit rate and line termination
- Selectable output unit: angular rate [deg/s] or incremental angle [deg]



STIM377H

STIM377H is a small, tactical grade, low weight, high performance non-GPS aided Inertial Measurement Unit (IMU) in a hermetic package. The package is a hermetic aluminum enclosure with a glassto-metal sealed electrical micro-d connector and a laser-welded lid to secure long-term hermetic operation. All parts are tested for fine and gross leak to conform to MIL-STD-883J, Class H.

STIM377H contains 3 highly accurate MEMS gyros, 3 high stability accelerometers and 3 inclinometers. The IMU is factory calibrated and compensated over its entire operating temperature range.

STIM377H is a cost-effective ITAR free solution for systems that only had FOGs as an alternative when reaching for the performance level of that STIM377H can offer.

- Hermetic package
- ► ITAR free
- Excellent performance in vibration and shock
- Excellent environmental robustness
- ▶ 1, 2 or 3 axes offered in same package
- Electronically calibrated axis alignment
- ► RS422 interface
- ► 24 bits resolution
- Single-crystal silicon technology
- ► Low bias drift
- Low noise
- ► 5 different sampling rates available
- ► 5 different bandwidths available
- ► LP filter -3dB frequency can be set



STIM380H

STIM380H is a small, tactical grade, low weight, high performance non-GPS aided Inertial Measurement Unit (IMU) in a hermetic package with greatly improved accelerometer performance. It contains 3 highly accurate MEMS gyros and 3 ultrahigh stability accelerometers. The IMU is factory calibrated and compensated for temperature effects over its entire operating temperature range.

STIM380H is a cost-effective ITAR free solution for systems that only had FOGs as an alternative when reaching for the performance level of that the STIM380H can offer.

- Miniature laser welded hermetic package
- Aluminum casing, 6082-T6 alloy SurTec
- ▶ 650 surface treated
- ► ITAR-free
- ► Low noise and bias instability
- Excellent performance in vibration and
- shock environments
- 6 axes offered in same package
 - Electronically calibrated axis alignment
- ► Gyros based on Safran ButterflyGyro™
 - Single-crystal silicon technology
 - ► No intrinsic wear-out effects
- ► High stability accelerometers
- ► PPS output
- Output-signal with programmable timing (CRS)
- Multi-module transmission
- Insensitive to magnetic fields
- ► Full EMI compliance
- ▶ Digital interface, RS422
- ► Fully configurable
- individually for each axis
- RS422 protocol, bit rate and line termination
- Selectable output unit: angular rate [deg/s] or incremental angle [deg]
- ► Continuous self-diagnostics
- Continuous self-diagnostics
- ► RoHS compatible
- Delivered in dust free clean-room packaging

PERFORMANCE			SENSONOR STIM300	SENSONOR STIM318	SENSONOR STIM320
Parameter - Gyro	Conditions	Units	IMU	IMU	IMU
Input Rate (maximum)	Cut off 20% above	°/s	± 400, ± 1200, ± 2000,	± 400, ± 1200, ± 2000,	± 400
Resolution		bits	24	24	24
Scale factor accuracy		ppm	500	500	500
Bandwidth (-3dB)		Hz	262	262	262
Sample rate	Max	Sample/s	2000	2000	2000
Group Delay	LP-filter -3bB=262Hz	ms	1.5	1.5	1.5
	LP-filter -3bB=131Hz	ms	3.0	3.0	3.0
	LP-filter -3bB=66Hz	ms	6.0	6.0	6.0
	LP-filter -3bB=33Hz	ms	12	12	12
	LP-filter -3bB=16Hz	ms	24	24	24
Bias Range		°/h	± 250	± 250	± 250
Bias Trim Offset Range		°/s	NA	±1	± 1
Bia Run-Run		°/h	4	4	4
Drift Rate Stability		°/h	3	3	3
Bias error over temperature	Static temperatures	°/h	≤ 9	≤ 9	≤ 9
Bias error over temperature gradients	≤1°C/min	°/h	≤ 10	≤ 10	≤ 10
Bias Instability	Allan variance @25°C	°/h	≤ 0.3	≤ 0.3	≤ 0.3
Angle Random Walk (ARW)	Allan variance @25°C	°∕√h	0.15	0.15	0.1
Non-Linearity	± 200°/s	ppm	15	≤ 15-20	≤ 15-20
	± 400°/s	ppm	20		
Linear Acceleraton Effect Bias	With g-compensation	°/h/g	1	1	1
	No g-compensation	°/h/g	7	7	7
Linear Acceleraton Effect SF	With g-compensation	ppm/g	50	50	50
	No g-compensation	ppm/g	400	400	400
Orthogonality		± mrad	± 0,2	± 0,2	± 0,2
Misalignment		± mrad	±1	±1	±1
Parameter - Accelerometers		Technology	MEMS	MEMS	MEMS
Fullscale		± g	±5/±10/±30/± 80,	±5/±10/±30/± 80,	±10/
Resolution		Bits	24	24	24
		ug	1,0/1,9/3,8/15,3	1,0/1,9/3,8/15,3	1,9
Scale Factor Accuracy		ppm	200/200/300/1000	200/200/300/1000	200
Scale Factor 1 year Stability		ppm	300	600	600
Non-linearity		ppm	100/100/100/1000	100/100/100/1000	100





www.a-m-c.com

COMPANY OVERVIEW

ADVANCED Motion Controls has earned a reputation for being the most flexible and affordable manufacturer of quality high performance and high power density servo drives. By selecting ADVANCED Motion Controls as your servo drive and controls supplier, you will be adding an integral member to your design engineering team with multi-industry expertise. 30+ years of servo drive manufacturing, with nearly 3 million servo axes built and shipped worldwide!



ANY NETWORK



We also have the ability to quickly produce custom DigiFlex[®] Performance[™] drives utilizing many other common types of network communication.

ANY MOTOR					
Three Phase (Brushless) Single Phase					
 Servo – BLDC, PMAC AC Induction (Closed loop vector) Closed loop stepper 	 Brushed Voice coil Inductive load 				
ANY F	EEDBACK				
ABSOLUTE ENCODER	Tachometer				
 EnDAT® Hiperface® BiSS®C – Mode 	 ▶ ±10 Vdc ▶ ±60 Vdc 				
1 VP – P SIN/COS ENCODER	Aux. Incremental Encoder				
INCREMENTAL ENCODER	Resolver				
±10 Vdc position	Hall Sensors				
ANY CO	ONTROLLER				
Digital or analog controllers	Digital or analog controllers				
 ±10 Vdc PWM and Direction Step and Direction 	 0 – 5 V (Standard, Inverted or Wigwag) 0 – 5 kW (Standard, Inverted or Wigwag) 				
ANY EN	VIRONMENT				
Extreme Ambient Temperatures	Component Temperature Protection				
 Standard products range from -40°C to +85°C Custom products operate down to -50°C and lower, and +100°C and higher! 	 Ø PCB operating temperatures up to 105°C 				



• ADVANCED Motion Controls Advantages:

- Battery supplied, mobile operation needing 8+ hours duty / 7-day standby capability
- • ≥98% efficiency to extend overall battery life
- Multiple power demands
- Common control system dictated same servo drive interface but with models having different power levels
- Minimal maintenance
- Operation typically in remote locations
- Long service life expected



● DigiFlex® Performance[™] Servo Drives

- Peak power output up to 27.4kW
- Three phase brushless (servo, closed loop vector, closed loop stepper)
- Single phase (brushed, voice coil, inductive load) motors
- Variety of feedback options Absolute Encoder (EnDat®, Hiperface®, BiSS® C-Mode), Incremental Encoder, Hall Sensors, Resolver, 1Vp-p Sin/Cos Encoder, Tachometer
- Compatible with DriveLibrary[™] ADVANCED Motion Controls' API for C++ motion programming

● AxCent[™] Servo Drives



- Unparalleled benefits in both simplicity and performance,
- NOT require computer hardware or software,
- Higher bandwidth and faster response times at a lower cost,
- Including ±10V analog, PWM and Direction, and specialized electric vehicle commands,
- Optical isolation between high and low power signals standard on certain models
- Current, Velocity, and Fault Monitor analog output signals

Extended Environment products (AZX – DZX Series)

ADVANCED Motion Controls' Extended Environment products are designed to operate under harsh thermal and mechanical extremes.

- Ambient operating temperatures from -40°C to 85°C
- Over Temperature up to 105°C
- Thermal rise cycling in about 2 minutes
- Shock up to 15g's at 11ms
- Vibration up to 30grms on all 3 axes
- Designed to assist system compliance toward: MIL-STD-810F: temperature, thermal shock, humidity, altitude, shock & vibration



High-reliability electric motors





www.icpe.ro

COMPANY OVERVIEW

ICPE or Institutul de Cercetări Electrotehnice® was established over 65 years ago. The modern research infrastructure, obtained successfully following the performance of local and international projects, is a solid basis for further research in electrical engineering, and related fields.

DC BRUSHED TORQUE MOTORS

DC Torque Motors operate on the same principles as the conventional DC motors but the magnetic circuit design and consequent mechanical configuration are designed for maximum torque output rather than the usual low torque / high speed characteristic. Arrange of unhoused units which are supplied as three separate components, a permanent magnet field assembly, a wound armature with precision bore for mounting and a brush ring assembly or brush segments.

Fixed element – the stator, is equipped with rare earth permanent magnets and the rotor is equipped with a dc specific winding which is connected to an extra flat commutator – brushed system. Low speed Torque Motors are beneficial for direct-drive applications. Position and velocity feedback can be achieved via additions of DC Tachos, Resolvers or Optical Encoders. The unhoused motors described below can be offered in custom designed housings for specific applications.



PRODUCT CODE	PEAK TORQUE [mNm]	TORQUE SENSITIVITY [mNm/A]	MOTOR CONSTANT [mNm/W]	OUTSIDE DIAMETER [mm]	HEIGHT [mm]
TQRB-15-0.39	77.7	25,1	10,3	38,10	9,78
TQRB-15-0.51	127	36,3	13,9	38,10	12,95
TQRB-15-0.51-B	141	32,4	16	38,10	12,95
TQRB-15-1.03	333	83,2	39,2	38,10	26,00
TQRB-15-1.1	353	50,4	28,3	38,10	27,94
TQRB-20-1.14	1200	150	86,6	51,00	29,00
TQRB-24-1-C	600	195	68,2	60,32	25,40
TQRB-30-0.78	777	256	87,4	76,20	19,80
TQRB-34-0.51	883	160	74,1	85,725	12,95
TQRB-34-0.95-A	2048	438	195	85,725	24,40
TQRB-34-1.46	3140	551	271	85,725	36,90
TQRB-37-0.54	1060	210	85,4	92,075	13,72
TQRB-37-0.54-B	1060	158	85,4	92,075	13,72
TQRB-37-0.84	2120	358	156	92,075	21,33
TQRB-37-1.46	4000	681	341	92,456	37,008
TQRB-45-0.56	2300	340	146	114,3	14,22
TQRB-45-0.69-B	3250	542	238	114,3	17,45
TQRB-45-0.69-C	3250	963	238	114,3	17,45
TQRB-45-0.86	4590	715	277	114,3	21,84
TQRB-45-1.08	6510	838	401	114,3	27,28
TQRB-51-0.58	2825	251	180	130,175	14,73
TQRB-51-0.93	2800	1400	422	130,175	23,9
TQRB-51-1.0	4800	1200	490	130,175	25,5
TQRB-51-2.1	10000	1515	716	130,175	53,34

D.C. LIMITED ANGLE BRUSHLESS TORQUE MOTORS

Limited Angle Torque Motors are ideal for compact, limited angular excursion, rotary, closed loop servo applications. Operating in the system, these units endure a long storage life and a harsh thermal and mechanical environment. All motors consist of a housed stator with a high density

winding around a steel core, molded in a special resin. The rotor is build from high-grade samarium cobalt magnets or neodymium, on a stainless steel core.

• Advantages

- No Torque Ripple
- High Angular Acceleration
- No Commutation
- Brushless
- Low Profile





AC SERVO MOTORS - BSM SERIES

BSM Series motors are available with high energy Nd-Fe-B magnets - 6 (six) magnetic poles - F Class Insulation - standard feedback system with resolver - winding protection with PTC - Standard protective structure is IP55 class - torque range from 0.1 to 20 Nm - high torque to weight ratios - superior low speed performance - very low inertia.

In this motor range below options are also available:

- Shaft with keyway according to DIN 6885
- Fail safe brake 24 VDC,
- Shaft seal ring,
- Additional feedback systems (encoder),
- Protection class IP65,
- Custom windings,
- Special dimensions and configurations.

SINUSOIDAL OUTPUT TRANSDUCERS - RESOLVERS

Resolvers which are directly supplied on the rotor winding, used on either limited angle, case in which they are supplied by means of flexible cables or on 360 degrees and, in this case, they are supplied through some collecting rings, as well as resolvers supplied by means of rotary transformer with a constant transformation ratio and the input and output winding terminals on the stator.

- Advantages
 - Used as an absolute angle transducer,
 - Resistance to mechanical stresses,
 - Operation within a wide temperature range.



PARAMETER	SYMBOL	UNITS	VALUE
Nominal Torque	M _n	Nm	9
Peak Torque	M _{max}	Nm	27
Motor Constant	K _M	N/W	1,4
Voltage	V _{pc}	V	600
Nominal Current	l _n	А	8,3
Torque Constant		Nm/A _{ms}	1,08
Back EMF Constant	K _E	V _{ms} /krpm	67
No-Load Speed	-	rpm	7000
Number of Poles	N _P		10
Phase Connection			Y
Line-to-Line Resistance	R,	Ω	0,4
Line-to-Line Inductance	L,	mH	5,3
Electric Time Constant	T_	ms	13,2
Insulation Class	_		Н
Thermal Resistance	T _P	°C/W	1,7
External Diameter	OD	mm	170
Stator/Rotor Length	L	mm	28
Motor Length	TL	mm	55
Inertia	J	kg cm²	105
Weight	Wt	kg	4,2



The stator is a laminated steel core with a three phase windings. The high energy permanent magnets outer rotor configuration provides a more rigid structure for the permanent magnets and has higher inertia.

• Advantages

- High torque due to large air gap radius,
- Stable low speed performance without feedback,
- Lower audible noise with reduced cogging.

• Other Product Groups

As the company is established to customize different electrical machines there are many different products that ICPE can offer as following:

- Flat brushless servo motors,
- Precision small brushless motors,
- AC servo motors,
- Linear motors,
- Electric generators,
- 2-D robot tables.







Absolute Encoders





www.netzerprecision.com

COMPANY OVERVIEW

Electric Encoder[™] Netzer's world-wide patented, rugged high performance Electric Encoder[™] technology, suits a wide variety of applications ranging from space and avionics, through military and defense, to instrumentation and automotive. The product portfolio includes Rotary & Linear absolute or incremental position encoders, with analog or digital outputs.

The Non-contact, absolute-position relies on interaction between the measured displacement and an internally shielded, space/time modulated, electric field and offers features unsurpassed by traditional optical and magnetic encoders.

Advantages of Electrical Encoders

- Simple, robust structure with a virtually no-failure-mechanism,
- Very low weight, inertia, and profile (=<10mm),
- Ring shaped, hollow shaft with a wide range of diameters,
- Precision to 0.001° in selected models,
- Default operation range from -55°C to +125°C,
- Insensitivity to EMI/RFI and magnetic fields,
- Ultra-high-speed options,
- Wide variety of position feedback protocols.
- The company has structured its product range based







The company has structured its product range based on price performance criteria for different types of applications. For industrial applications DX and VLX products; for defense and avionic applications VLP, DS and DF products are available.



Netzer products are also verified with their high MTBF as shown in below diagram.





Sliprings, Rotaryjoints





www.pan-link.cn

COMPANY OVERVIEW

Panlink focuses on high end slip rings' R&D and manufacturing for 16 years with nearly 100 employees and 3000 square meters production area. The company has powerful R&D and management team providing cutting edge design and process technology.

Product range is very diverse such as military, wind turbine, heavy machinery, large CT, hybrid slip rings etc. to worldwide clients.



Typical Applications

A slip ring can be used in any electromechanical system that requires unrestrained, intermittent or continuous rotation while transferring power and / or data.

- Defense
- Medical equipment
- Wind power
- Oil exploration
- Environment treatments
- Antenna systems
- Aviation & Navigation
- Robotics
- Port equipment
- Cable reel
- Offshore platform

Slip Ring Solutions

- Support all kinds of signals and communication protocols.
- Electrical, FORJ, RF and media channels can be flexibly combinedEnvironment treatments.
- Experienced in slip ring solutions for used in SIEMENS and other brand servo-drive systems.
- Can provide suitable slip ring solutions for use in various harsh environments.

• Communication Protocol



Practical Applications



Multi-channel air hybrid slip ring

Multi-channel FORJ

Servo system slip ring

Non-contacting slip ring

Pancake slip ring



• Slip Rings for Radar Systems



Multi-function, high speed data and remote transmission

FEATURES

- Up to 50M revolutions long life
- Multi signals combination video, RF and network
- EMI immunity and signal leak prevention
- Support multi-channel high speed data transfer
- Integrate with encoder, can detect rotating speed and angle
- Compact design and easy mounting

SPEC

Fiber: SM and MM optional Wavelength: 650 - 1650 nm Insertion loss: <2 dB (typical: <0.5 dB) Return loss: >40 dB (typical:45 dB, 2323 C), >50 dB (MJXA) Encoder: incremental and absolute optional Pulse: 512 - 10240



Coaxial / waveguide rotary joints for **radar systems**

• Ultra Miniature Slip Rings for Airborne Fields

Recommended model: PSR-TM10S

PSR-TM10S is the first ultra-miniature slip ring in China market. With 5.9mm dia x 7.62mm flange, it can provide 1~10 circuits power and signal transfer. Stainless steel housing, hard gold contact materials, V-shape groove design, low torque, low wear, ensure sensor and thermocouples etc. weak signals' reliable transmission.

Typical Applications

- Aircraft electro-optical pod
- Missile guidance system





5 5

• Multi-circuits Military Slip Rings

Recommended model PSR-Ms

PSR-Ms series SR are specially designed for space technology experiments. 60-200 circuits optional, can provide power, analog and high speed digital signals transfer. Compliant with EMC and 3D vibration proof, ensure power and signal's stable transmission without interference

• Typical Applications

Aerospace 3D simulation motion turntable

• Hybrid Fiber-electrical Slip Rings

SPEC

- Contactless, no friction, long lifetime up to 50M revolutions
- Combine various signals video, series data, network data
- No signal leakage, EMI immunity
- Support multi-channels high speed data transmission
- Small size, light weight, stainless steel, suitable for airborne or marine
- environments
- With pressure compensation, good sealing, can work in undersea
- ► 7000m or space environments

PARAMETERS

Fiber: SM a or MM Wavelength: 650 - 1650 nm Insertion loss: <2 dB (typical: <0.5 dB) Return loss: >40 dB (typical:45 dB, 2323 C), >50 dB (MJXA)





PMD

www.pmdcorp.com

COMPANY OVERVIEW

ADVANCED Motion Controls has earned a reputation for being the most flexible and affordable manufacturer of quality high performance and high power density servo drives. By selecting ADVANCED Motion Controls as your servo drive and controls supplier, you will be adding an integral member to your design engineering team with multi-industry expertise. 30+ years of servo drive manufacturing, with nearly 3 million servo axes built and shipped worldwide!

MAGELLAN POSITIONING IC FAMILY



- Intelligent, single-axis
- Multi-motor
- Easy, preconfigured motion commands

Magellan® MC5XX2X ICs

- Intelligent, multi-axis
- Multi-motor
- Easy, preconfigured motion commands



- Digital current loop •
- Onboard memory

- Digital current loop
- Onboard memory

ATLAS® DIGITAL AMPLIFIERS



- Intelligent, single-axis
- Multi-motor •
- Easy, preconfigured motion commands
- Digital current loop
- Onboard memory



JUNO® VELOCITY & TORQUE IC FAMILY



- Ultra-efficient performance
- Four-quadrant control
- Safety features built in

Velocity Control ICs: Sophisticated velocity and torque control of 3-phase brushless DC, DC brush, step motors or multi-motor. Step Motor Control ICs: State of the art step motor control with pulse and direction or SPI command input. Torque Control ICs: Ultra precise torque control for **3-phase brushless DC** and DC brush motors with direct analog or SPI









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