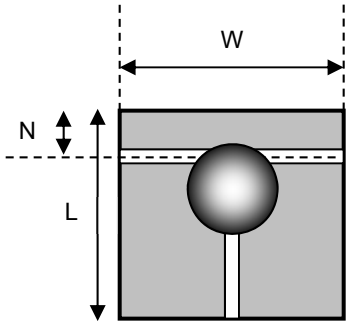
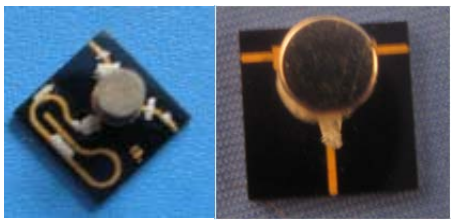
MSSM Metal Backed Substrate 2.0-50GHz (10% Bandwidth)

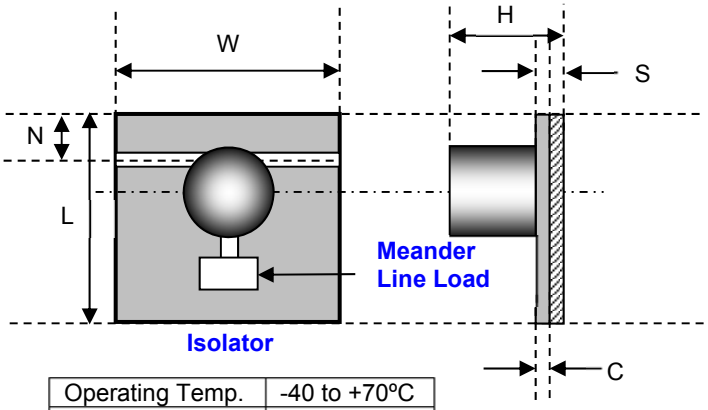
Ferrite substrates on steel carriers.



Circulator



Units: mm (Inch)
Not to scale



Isolator

Operating Temp.	-40 to +70ºC
Storage Temp.	-40 to +85ºC

Note: Dimension S (overall pad height) is critical, Dimension C (Ferrite Thickness) is for reference only / not critical

All thin film isolator circuits are gold on copper, suitable for soldering (very easy with regular solder, (silver solder preferred), or gold thermo-compression bonding

PM: Phase Matching

Tolerance Table Metric (inch)

(unless otherwise stated):

Dimensions (w,l) +/- 0.03 mm, (+/- 0.001") at 25GHz
Dimensions (w,l) +/- 0.043 mm, (+/- 0.002") at 5GHz
Dimensions (Microstrip pad, +/- 0.1mm, (+/- 0.04")

Machined surfaces

Flatness 0.025/mm, (0.001/ inch)
Bend radius 0.8mm, (0.031" or 1/32")

Direction of RF:	
R	Default ▶
L	◀

Order Examples: RADI-2.3-2.7-MSSM-1WR

I=ISOLATOR / C=CIRCULATOR

Frequency GHz	I/C	W mm	L mm	H mm max	C mm Ref	N* mm	S +/- 0.035	In. loss (dB)	Isol. (dB)	VSWR	Pwr Fwd (W)	Pwr Rev (W)	Miscellaneous
2.3-2.7	I/C	20	20	6	tba	tba	tba	0.7 0.9	18 16	1.30:1 1.40:1	1	1	room -10 to +60, b
2.35-2.45	I	17.5	17.0	5		2.54	1.3	0.5	21	1.28:1	2	0.25	p
2.45-2.47	I	20	20	5.5	1.0	2.0	1.0	0.4 0.6	20 17	1.25:1 1.35:1	1	1	+25 -40 to +80, b
2.9-3.2	I	15	17	5.5	tba	tba	tba	0.5	20	1.25	1	1	+1 to +50, b
2.9-3.2 (4060)	I	15	17	5.5	tba	tba	tba	0.5 0.7 0.6	20 18 18	1.25:1 1.30:1 1.30:1	1	1	+1 to +50 -40 to +0 +50 to +60, b
3.05-3.5	I	15	17.0	5	1.0	3.5	2	0.6	18	1.35:1	2	0.2	0.5 / 20 / 13 @ RT b SO 8252
3.1-3.4	I	15	16	5.3	1	3.5	1.3	0.6 0.8	19 17	1.30:1 1.35:1	1	0.25	room -10 to +50ºC, b
3.1-3.4 (1515)	I	15	15	5.5	1	3.5	1.3	0.5 0.7	19 17	1.30:1 1.35:1	1	0.2	room -10 to +60ºC, b
3.4-4.2	I	15.0	17.0				1.3				2	1	**b**
3.6-5.2 (Preliminary)	C	12	12	5.5	tba	tba	tba	0.8 0.9	16 15	1.40:1 1.50:1	1	1	room -10 to +60C, b
3.9-4.4	I	15.0	17.0	5		2.54	1.3	0.6	18	1.30:1	2	0.25	**p**
4.1-4.3	I	12	12	5.3				0.5	20	1.25:1	1	1	room

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MSSM Metal Backed Substrate 2.0-50GHz (10% Bandwidth)

Ferrite substrates on steel carriers.

Frequency GHz	I/C	W mm	L mm	H mm max	C mm Ref	N* mm	S +/- 0.035	In. loss (dB)	Isol. (dB)	VSWR	Pwr Fwd (W)	Pwr Rev (W)	Miscellaneous
								0.7	18	1.30:1			-10 to +50, b
4.2-4.4	I	12	15	5.5	tba	tba	tba	0.4	20	1.25:1	1	1	-10 to +50, b
4.4-5.0	I	12.7	16	5.5		2.54	1	0.5 0.7	20 18	1.25:1 1.35:1	5	5	+25 -30 to +70, b
4.4-5.0 (10x09)	C	10.6	9.0	5.4	tba	tba	tba	0.5 0.6	20 18	1.25:1 1.30:1	1	1	room -10 to +60, b
4.4-5.0	C	12	9	5.4	tba	tba	tba	0.5 0.6	20 18	1.30:1	1	1	room -10 to +60, b
4.8-5.5	C	10	9	4.5	tba	tba	tba	0.5 0.7	20 17	1.25:1 1.35:1	8		room -30 to +85, b
4.9-5.2	I	10	9	4.5				0.5	20	1.25:1	0.5	0.25	-10 to +60C, b
5.0-5.2	I	12	12	5				0.5	20	1.25:1	1	0.25	p
5.0-5.9	C	15.0	17.0	5		2.54	1.3	0.6	19	1.30:1	15	15	High Power **p**
5.2-5.9	I	10.6	9	5	0.635	1.5	1.3	0.5	20	1.30:1	2	0.25	**p**
5.2-5.95-HP	C	10.6	9	5	0.635	1.5	1.3	0.5	20	1.30:1	20	20	Optimized for 4.7-5.2 GHz 0.8/16/1.5
5.2-5.95 sp1	C	9.5	9.5	5	0.635	1.5	1.3	0.5	20	1.30:1	10	10	sp-1 SPECIAL
5.2-5.95 HP	C	10.6	9	5	0.635	1.5	1.3	0.5	20	1.30:1	20	20	High Power
5.225-5.475	I	10	9	5.5	tba	tba	tba	0.5	20	1.25:1	0.2	0.2	-10 to +60C, b 1W Pk, 20%DC
5.25-5.85	C	10.6	9	5	0.635	1.5	1.3	0.5	20	1.30:1	2	2	p
5.25-6.75	I	12	12	5.5	0.635	3.0	1.65	0.5 0.6	20 18	1.25:1 1.30;1	1	2	room -20 to +60,b
5.3-5.9 (5585) 10x10)	C	10	10	4.5	tba	tba	tba	0.5 0.7	20 17	1.25:1 1.35:1	5	5	b -55 to +85
5.3-5.9 (5585) 12x12)	C	12	12	tba	tba	tba	tba	0.5 0.7	22 17	1.17:1 1.35:1	5	5	b -55 to +85
5.36-5.96	I	10	9	5	0.635	1.0	1.0	0.4 0.6	20 18	1.25:1 1.30:1	1	1	+25 -40 to +80, b
5.4-5.9	I	10	9	5.5				0.4 0.5	20 18	1.25:1 1.30:1	2	2	+25 -10 to +60, b
5.6-6.4	C	10	9	5.5	tba	tba	tba	0.6	18	1.30:1	2	2	0 to +50, b
5.6-7.4	I	10	9	5.5	tba	tba	tba	0.6	18	1.30:1	2	1	b-p
5.6-7.4	C	10	9	5.5	tba	tba	tba	0.6	18	1.30:1	2	2	preliminary
5.7-5.9	C	10	9	4.5	tba	tba	tba	0.5	20	1.25:1	1	1	0 to +50, b, 1W
5.8-6.2	I	10.7	9	5			1.5	0.5	20	1.25:1	0.25	0.25	-20 to +65, b
5.8-6.7	I	12	11	6		2.5	1.64	0.5	20	1.25:1	1	0.25	-40 to +70
5.8-6.7	I	12.7	24.1	5.5	tba	tba	tba	0.5	20	1.25;1	25	25	-40 to +80, b
5.85-6.73	I	12	11	6		2.5	1.64	0.5	20	1.25:1	1	1	-40 to +70 p
5.8-7.2	C	12	11	6		2.5	1.64	0.5	20	1.25:1	1	0.25	-40 to +70
5.85-7.02	I	12	11	6		2.5	1.64	0.5	20	1.25:1	1	0.25	-40 to +70
5.9-6.4	I	10	9	4.5				0.5	20	1.25:1	0.5	0.25	-10 to +60C, b
6.0-7.0	C	12	11	6	0.635	2.0	1.64	0.5	19	1.25:1	20	20	e -30 to +70
6.3-6.5	I	10	9	5	0.635	1.0	1.0	0.4 0.6	20 18	1.25:1 1.30:1	1	1	+25 -40 to +80, b
6.5-7.5	I	10.7	14	3.8	tba	tba	tba	0.5 0.7	20 17	1.25:1 1.35:1	3	20	-10 to +50 -55 to +85, b
6.7-7.1	I	12	11	6		2.5	1.64	0.5	20	1.25:1	1	1	-40 to +70 b
7.0-9.0 (b)	C	10	9	5	0.635	2.5	1.64	0.6	17	1.35:1	1	1	b -40 to +70
7.0-9.0 (e)	C	10	9	5.5	0.635	2.5	1.64	0.6	18	1.30:1	1	1	e -40 to +70
7.1-8.5	I	10	9	5	tbc	2.5	1.64	0.5 0.6	20 16	1.25:1 1.30:1	1	0.25	room -10 to +60, b

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7.1-8.5 (3060)	I	10	9	5	tbc	2.5	1.64	0.5 0.7	20 18	1.25:1 1.30:1	1	1	room -30 to +60, b
7.1-8.5 (2070)	C	10	9	5	0.635	2.5	1.64	0.5	18	1.30:1	3		-20 to +70, b
7.1-8.5	I	10	9	5.5	0.635	2.5	1.64	0.5	18	1.30:1			
7.1-8.8	I	10	9	5.5				0.6	16	1.40:1	10	1	-10 to +70C, b
7.2-7.79	C	10	9	5.5	0.635	2.5	1.64	0.5	19	1.25:1	1	1	-90 to +70
7.22-7.78	I	10	9	4.5				0.4	20	1.25:1	1	1	-10 to +50C, b
7.25-7.75	I/C	10	9	5.5				0.6	16	1.40:1	10	1	-10 to +70C, b
7.9-8.4	I	10	9	5	tbc	tbc	tbc	0.5 0.6	20 16	1.25:1 1.30:1	1	1	room -40 to +70 b
8-9	C	7	7	5.0	0.635	1.5	1.3	0.5	20	1.25:1	20	20	High Power
8-9	I	7	7	5.0	0.635	1.5	1.3	0.5	20	1.25:1	10	0.2	
8-9	I	10	7	5	0.635	1.0	1.3	0.5 0.7	20 18	1.25:1 1.30:1		0.25	+15 to +35 -40 to +70, b
8.0-8.5	I	7	7	3.5	tba	tba	tba	0.6	18	1.30:1	1	1	-10 to +50, b
8.0-8.5 (3060)	I	10	9	5	tba	tba	tba	0.5 0.7	20 18	1.25:1 1.30:1	1	1	+25 -30 to +60, b
8-10.5-small-(0606) **1-1.5 GHz BW**	C	6	6	**4.5**	tbc	tbc	tbc	0.6 0.8	20 18	1.25:1 1.30:1	5		room -10 to +70, b
8.0-11.5	C	9	9	5	tbc	tbc	tbc	0.6 0.7	18 17	1.30:1 1.40:1	8 25w Pk		room -10 to +70
8.0-11.5	I	9	13.5 with load	5	tbc	tbc	tbc	0.6 0.7	18 17	1.30:1 1.40:1	8 25w Pk		room -10 to +70
8-12	C	10	10	8			1.0	0.7	18	1.30:1	20		-10 to +60, b
8-12	I	9	9	5				0.8 1.0	17 15	1.35:1 1.50:1	5	1	+25 -30 to +60, b
8.3-9.7	I	7	7	3.2	tbc	tbc	tbc	0.8	16	1.40:1	0.25	0.25	1W Pk, 15% DC
8.4-10.7 (0707)	C	7	7	5	tbc	tbc	tbc	0.5 0.7	18 16	1.30:1 1.40:1	10 20W Pk		+15 to +35 -20 to +90, b (storage temp:-40 to +90)
8.4-10.7	C	9	9	5	tbc	tbc	tbc	0.5 0.7	20 17	1.22:1 1.35:1	10 20W Pk		+15 to +35 -20 to +90, b (storage temp:-40 to +90)
8.5-9.5	I	7	11	5.5	tbc	tbc	tbc	0.5	19	1.25:1	10	1	-10 to +70, b
8.5-9.6	I	7	7	3.2	tbc	tbc	tbc	0.5	20	1.25:1	0.25	0.25	b
8.5-9.6 (0808)	I	8.76	8.76	3.5	tbc	tbc	tbc	0.5	20	1.25:1	0.25	0.25	b
8.5-9.6 (2060)	I	8	8	4	tba	tba	tba	0.5	17	1.40:1	10 Ave 50W Pk	3	-20 to +60°C, b
8.5-10.0	C	9	9	tba	tba	tba	tba	0.5 0.7	20 17	1.25:1 1.40:1	1		+25 -40 to +85, b
8.5-10.5	I	9	9	4.7	tba	tba	tba	0.5 0.6	20 18	1.25:1 1.30:1	1	1	+25 -30 to +60, b
8.5-10.5-4070	I	9	9	4.7	tba	tba	tba	0.5 0.6	20 17	1.25:1 1.40:1	1	1	+25 -40 to +70, b
8.5-10.5	C	9	10	4.7				0.5 0.6	18 17	1.30:1 1.35:1	6	6	+25 -30 to +60, b
8.5-10.5	C	10	10	8			1.0	0.6 0.7	18 17	1.30:1 1.35:1	20		+25 0 to +50, b
8.7-10.5	C	7	7	4				0.4	18	1.30:1	10		-30 to +70, b
8.8-10.2	C	7	7	4.5	0.635	1.5	1.3	0.5	18	1.30:1	10	1	High Power RFQ 13036 b
8.9-10.7	C	7	7	4.5	tbc	tbc	tbc	0.4 0.5	20 18	1.25:1 1.30:1	3		15W Pk, room/ -35 to +70

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9.0-9.6	I	7	11	5.5	tbc	tbc	tbc	0.5	20	1.25:1	10	1	-10 to +70, b
9-10	I	7	12	3.5	tbc	tbc	tbc	0.5 0.7	20 18	1.30:1 1.35:1	10	1	-10 to +50 -30 to +80, b
9-10 HP	I	7	11	5.5	tbc	tbc	tbc	0.5	20	1.25:1	10	1	-10 to +70, b
9-10 HP	C	7	7	5.0	0.635	1.5	1.2	0.5	20	1.25:1	20	1	High Power
9-10 (0707)	C	7	7	5	0.635	1.5	1.0	0.4 0.5	20 18	1.25:1 1.30:1	20 Ave		+1 to +45 -10 to +60, 20W,b,
9-10	C	10	10	4	tbc	tbc	tbc	0.5 0.6	20 16	1.25:1 1.30:1	20		room -30 to +60, b
9-10 std	I/C	7	7	5.0	0.635	1.5	1.3	0.5	20	1.25:1	10	0.2	
9-10	I	7	7	4	tbc	tbc	tbc	0.5 0.7	20 18	1.30:1 1.35:1	1	0.25	-10 to +50 -40 to +70, b
9-10 (050)	I	7	7	5	0.635	1.5	1.3	0.5	20	1.25:1	1	0.25	0 to +50C, b
9-10	I	7	7	5.5				0.4	20	1.25:1	0.1	0.1	-10 to +60C, b
9-10 (3070)	I	7	7	4	0.635		0.5	0.5 0.7	20 18	1.25:1 1.30:1	10	2	+25 -30 to +70, b
9-10 std	C	7	7	4.7				0.5 0.6	20 18	1.25:1 1.30:1	6	6	+25 -30 to +60, b
9-10	I	7	7	3.9	0.635	1.5	1.7	0.5 0.7	20 18	1.25:1 1.30:1	2		+15 to +35 -40 to +75, b
9-10-sp1	C	8.9	12.1	5.0	0.635	4.48	1.3	0.6	20	1.25:1	20	20	High Power
9-10-small -(6060a)	C	6	6	5.0	0.635	4.48	1.3	0.4 0.65	19 17	1.25:1 1.33:1	10	0.2	+25 -30 to +60, b
9-10-small -(6060b)	C	6	6	4.0	0.635	1.5	1.3	0.4 0.65	19 17	1.25:1 1.33:1	10	0.2	+25 -30 to +60, b
9-10-small-(0606c) <1GHz BW	C	6	6	**2.5**	tbc	tbc	tbc	0.6 0.8	20 18	1.25:1 1.30:1	5		room -10 to +70, b
9-10 (1060)	C	10	6	5	tbc	tbc	tbc	0.4 0.5	20 18	1.25:1 1.30:1	10		room -10 to +60°C,b
9-10 (6075)	C	6.05	7.55	3.5	tbc	tbc	tbc	0.5	18	1.30:1	10		-10 to +60°C,b
9-10.5 (6363)	I/C	6.35	6.35	5.0	tbc	tbc	tbc	0.5 0.6	20 18	1.25:1 1.30:1	10	0.2	room -30 to +60°C
9-10.5 (7x7)	I/C	7	7	5.0	tbc	tbc	tbc	0.5 0.6	20 18	1.25:1 1.30:1	10	0.2	room -30 to +60°C
9-10.5 (8x8)	I	8	8	5.5	0.653	2.0	1.635	0.5 0.7	20 18	1.25:1 1.30:1	10	2	room -40 to +85
9.0-10.5	I	7	7	4.5	0.635	1.5	1.35	0.5 0.7	20 18	1.25:1 1.30:1		0.25	+15 to +35 -40 to +70, b
9-11	C	10	9	5.5	0.635	2.5	1	0.5 0.6	20 18	1.25:1 1.30:1	10		room, -10 to +60,b
9-11	C	10	9	4.5	0.635	1.5	1.64	0.5 0.6	20 18	1.25:1 1.30:1	10	10	room, -10 to +60,b
9.1-9.6	C	7	7	5.0	0.635	1.5	1.64	0.5	20	1.22:1	1	1	
9.2-9.5	C	7	7	5.0				0.5	20	1.25:1	5		b
9.2-9.6	C	7	7	5.0	0.635	1.5	1.2	0.5	20	1.25:1	20	20	High Power
9.2-10.0	C	7	7	2.5	tba	tba	tba	0.5	17	1.43:1	3		12W PK (25% duty cycle), b
9.2-10.0	C	7	7	4.3	tba	tba	tba	0.4	20	1.22:1	10	10	25W PK (-15 to +55°C), b
9.2-10.8	I	7	7	4	0.635	tbc	1.0	0.3 0.4	23 20	1.15:1 1.25:1		2	room -60 to +85°C, b
9.5-11.5	I/C	7	7	5.0	0.635	1.5	1.64	0.5	20	1.22:1	1	0.2	p
10-12	I/C	7	7	5.0	0.635	1.5	1.64	0.6	20	1.35:1	10	0.2	
10-12	C	7	7	5	tba	tba	tba	0.6	18	1.30:1	10	2	-10 to +60°C, b

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Frequency GHz	I/C	W mm	L mm	H mm max	C mm Ref	N* mm	S +/- 0.035	In. loss (dB)	Isol. (dB)	VSWR	Pwr Fwd (W)	Pwr Rev (W)	Miscellaneous
10.6-11.8	I/C	7	7	5.0	0.635	1.5	1.64	0.6	20	1.35:1	10	0.2	P
10.7-11.7	I/C	7	7	5.0	0.635	1.5	1.64	0.6	20	1.35:1	10	0.2	P
10.7-12.7 (7x6)	I	7	6	5.5	0.635	1.5	1.64	0.4 0.5	20 18	1.25:1 1.30:1	1	1	room -30 to +60
10.7-12.7 (7x7)	I/C	7	7	3.8	0.635	1.5	1.435	0.4 0.5	20 18	1.25:1 1.30:1	3	1	room -20 to +70
10.9-12.8	I	7	7	4.5				0.5	20	1.25:1	1	1	-10 to +50C, b
10.95-11.7	I/C	7	7	5.0	0.635	1.5	1.64	0.6	20	1.35:1	10	0.2	P
11.2-12.2	I/C	7	7	5.0	0.635	1.5	1.64	0.6	20	1.35:1	10	0.2	P
11.5-11.9-(7070)	I	7	7	4.5				0.6	18	1.35:1	1	1	-40 to +85C, b Storage temp. -55 to +95C
11.5-11.9-small-(6363) **C# IS175**	I	6.3	6.3	4.5	0.635	1.5	1.2	0.6	18	1.35:1	1	1	-40 to +85C, b Storage temp. -55 to +95C
11.5-11.9-small-(6060)	I	6	6	4.5				0.6	18	1.35:1	1	1	-40 to +85C, b Storage temp. -55 to +95C
11.5-13.5	C	7	7	3.76	0.57	1.5	1.17	0.5	19	1.25:1	1	1	
11.7-12.5	I	7	7	3.76	0.57	1.5	1.17	0.5	20	1.25:1	5	5	p
11.7-12.75	C	7	7	3.76	0.57	1.5	1.17	0.5	20	1.25:1	5	5	
11.7-14.5	I	7	7	6.0		1.5	1.5	0.6	20	1.30:1	1	0.25	-40 to +70
12.0-13.5	C	7	7	6.0				0.6	20	1.30:1	5	5	0 to +85
12.0-12.7	I	7	7	5			1.5	0.5	20	1.25:1	0.25	0.25	-20 to +65, b
12.2-12.75	I	7	7	5			1.5	0.5	20	1.25:1	0.25	0.25	-20 to +65, b
12.5-14.0	I	7	7	3.8				0.5	20	1.25:1	1	1	-10 to +60C,b
12.75-14.5	I	7	7	4	tba	tba	tba	0.5	20 18	1.25:1 1.30:1		0.5	room -30 to +70, b
13-15	I	7	7	6.0		1.5	1.5	0.6	20	1.30:1	1	0.25	-40 to +70
13.0-13.6-(7x7)	I	7	7	4.5				0.6	18	1.35:1	1	1	-40 to +85C, b Storage temp. -55 to +95C
13.0-13.6-small-(6363) **C# IS176**	I	6.3	6.3	4.5	0.635	1.5	1.2	0.6	18	1.35:1	1	1	-40 to +85C, b Storage temp. -55 to +95C
13.0-13.6-small-(6x6)	I	6	6	4.5				0.6	18	1.35:1	1	1	-40 to +85C, b Storage temp. -55 to +95C
13.5-14.5	C	7	7	3.76	0.57	1.5	1.17	0.5	19	1.25:1	10,20	10,20	High Power RFQ 10955 b
13.5-14.75	I	7	7	3.3	tba	tba	tba	0.4	20	1.22:1		1, 2	-30 to +75, b
13.75-14.5	C	7	7	4.5	tba	tba	tba	0.5	19	1.25:1	10		-40 to +85, b
13.75-14.5	I	7	7	4.5				0.5 0.6 0.6	20 18 17	1.25:1 1.30:1 1.35:1	1	1	+25 -40 to +85C, b +70 to 85C
13.75-14.5 (6x6)	I	6	6	4	tba	tba	tba	0.5	20	1.25:1	1	1	-10 to +60, b
13.75-14.5 (4065)	I	6	7	4	0.635	1.5	1.15	0.6	18	1.30:1	1	1	-40 to +65, b
14.0-14.5	C	7	7	3.76	0.57	1.5	1.17	0.5	19	1.25:1	1	1	
14.0-15.0 (special device)	I	6	7.5	3.5				0.5 0.6	18 17	1.30:1 1.35:1	5	5	room -40 to +85C, b

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MSSM Metal Backed Substrate 2.0-50GHz (10% Bandwidth)

Ferrite substrates on steel carriers.

Frequency GHz	I/C	W mm	L mm	H mm max	C mm Ref	N* mm	S +/- 0.035	In. loss (dB)	Isol. (dB)	VSWR	Pwr Fwd (W)	Pwr Rev (W)	Miscellaneous
14-15 (3263)	I	7	7					0.6	17	1.35:1	1	1	-32 to +63C, b
14-15 (0606)	I	6	6	customer	special								See customer data sheet
14-15 (0707)	I	7	7	customer	special								See customer data sheet
14.0-15.4 (3265)	I	7	7					0.6	17	1.35:1	1	1	-32 to +65C, b
	Non-operating temperature -40°C/ +55°C (the device can support 3 cycles at 5°C/ min) Storage temperature -40°C/ +70°C (the device can support up to 72h for each temperature)												
14.0-15.6	I	7	7	4.0	0.50	1.5	1.50	0.5 0.6	20 18	1.25:1 1.30:1	1	1	+25C -30 to +60C, b
14.0-18.0	I	7	7	3.8				0.8 0.9	17 16	1.35:1 1.40:1	0.5	0.5	room -10 to +60C, b
14.0-18.0	C	7	7	3.76	0.57	1.5	1.17	0.5	19	1.25:1	1	1	draft p RFQ 21933 in process
14.25-15.5	C	7	7	3.76	0.57	1.5	1.17	0.5	19	1.25:1	1	1	
14.4-15.4	C	7	7	3.76	0.57	1.5	1.17	0.5	19	1.25:1	1	1	
14.75-15.25	I	7	7	4.5	0.5	1.5	1.05	0.5	20	1.25:1		1	-40 to +70, b
15-16	I	7	7	3	tba	tba	tba	0.6	20	1.30:1	1	1	-10 to +60, b
15-16	I	7	7	3.7	tba	tba	tba	0.6	20	1.30:1	1	1	-10 to +50, b
15-17	I	7	7	3	tba	tba	tba	0.8	20	1.30:1	1	1	-10 to +60, b
15-17	I	7	7	3.7	0.5	1.5	1.5	0.7 0.8	19 18	1.30:1 1.35:1	1	1	-10 to +50, b -20 to +70
15-17 (4070)	I	7	7	3.7	0.5	1.5	1.5	0.9	17	1.35:1	1	1	-40 to +70, b
15-17(5595)	C	5	5	3.5	tba	tba	tba	0.6	18	1.30:1	2		-55 to +95, b
15-18	I	7	11	4	tba	tba	tba	0.6 0.8	18 16	1.35:1 1.45:12	3	10	-10 to +50 -55 to +85, b
15.5-17.5	C	7	7	3.7	0.5	1.5	1.50	0.5 0.6	18 16	1.30:1 1.40:1	15	2.5	-40 to +95C, b
15-18	C	7	7	4.5				0.7	18	1.35:1	1	1	b
15.2-18.2 e 6x6	C	6	6	4.5	0.50	1.5	1.5	0.6	18	1.25:1	1	1	e -30 to +70
15.2-18.2 b 7x7	C	7	7					0.6	18	1.30:1	1	1	b -30 to +70
15.2-18.2 b 8x8	C	8	8	5.0	0.50	1.5	1.5	0.8	17	1.40:1	1	1	b -30 to +70
15.5-16.5	I	7	7	4.5	0.53	1.5	1.03	0.6	19	1.25:1	1	0.3	
15.5-16.5	C	7	7	4.5	0.53	1.5	1.03	0.6	19	1.25:1	4	1	
15.5-17.9	C	7	9	5	0.5	1	1.5	0.6	19	1.35:1	10	10	e
15.6-16.8	I	7	7	4	tba	tba	tba	0.6	20	1.30:1		0.25, 1	-30 to +60, b
16.0-17.0	I	7	7	4.5	0.5	1.5		0.7	18	1.30:1	2	1	e -30 to +70°C
16-18	I	7	7	3.7	tba	tba	tba	0.8	18	1.35		1	-10 to +60, b
16.2-17.2	I	6	7	5.5				0.6	20	1.30:1	1	1	-10 to +60°C, b
16.5-17.5	I	7	7	3	tba	tba	tba	0.7	20	1.30:1	1	1	-10 to +60, b
16.5-17.5	I	7	7	3.7	tba	tba	tba	0.6	20	1.30:1	1	1	-10 to +50, b
16.6-17.6	C	7	7	3	tba	tba	tba	0.6 0.7	19 17	1.25:1 1.35:1	1	1	room -30 to +60, b
16.62-17.71	I	7	7	4.5	0.53	1.5		0.65	19	1.30:1	2	1	p
16.8-17.4	C	6	6	3.5	tba	tba	tba	0.6	20	1.30:1	10		-40 to +70, b
16.85-20.5	I	6	6	2.9	tba	tba	tba	0.9	18	1.30:1	2	0.2	-10 to +50, b
16.9-17.3	I	7	7	4.5	0.53	1.5		0.65	19	1.30:1	2	1	-40 to +70, b
16.9-17.3-4085	I	7	7	4.5	tba	tba	tba	0.5 0.7	20 18	1.25:1 1.30:1	2	1	room -40 to +85, b
17.0-17.5	I	7	7	4.5	0.53	1.5	1.03	0.6	20	1.30:1	1	1	
17.0-17.5	C	7	7	4.5	0.53	1.5	1.03	0.6	20	1.30:1	4	1	
17-25	I	6 7	6 7	3.3 4.5				1.3	16	1.5:1	1	1	b
17.25-18.75	I	7	7	4.5	0.53	1.5	1.03	0.7	19	1.25:1	1	0.25	

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MSSM Metal Backed Substrate 2.0-50GHz (10% Bandwidth)

Ferrite substrates on steel carriers.

Frequency GHz	I/C	W mm	L mm	H mm max	C mm Ref	N* mm	S +/- 0.035	In. loss (dB)	Isol. (dB)	VSWR	Pwr Fwd (W)	Pwr Rev (W)	Miscellaneous
17.3-18.4	I	6	6	3.7	0.38	1.5	1	0.7	18	1.30:1	1	1	b -10 to +70
17.5-18.5	C	6	6	3.7	0.38	1.5	1	0.7	18	1.30:1	4	4	b -10 to +70
17.5-19.7	I	6	6	3.8	tba	tba	tba	0.8	20	1.30:1	1	1	-10 to +60°C, b
17.7-19.7	I	6	6	2.9	tba	tba	tba	0.8	20	1.30:1	2	0.2	-10 to +50, b
18.0-18.7	I	7	7	4.5	0.53	1.5	1.03	0.8	20	1.30:1	2	2	
18-23	I	6	6	3.7	tba	tba	tba	1.0	17	1.35:1		0.5	-10 to +50, b
18.0-26.5	I	6 7	6 7	3.3 4.5				1.3	16	1.50:1	1	1	b (proto)
18.86-19.26	C	6	6	4				0.8	20	1.30:1	2	2	p
19-21	C	5	5	4		1.35	1.2	0.8	18	1.30:1	2	1	
19-21	I	5	7	4	0.38	1.35	1.2	0.8	18	1.30:1	2	1	
19-21	I	6	6	3.7				0.8	20	1.30:1		0.25	-10 to +60°C, b
19.0-21.5 (0507-0.9S)	I	5	7	4	0.38	1.35	0.9	0.85 1.00	18	1.35:1 1.40:1	2	1	-30 to +70°C, -40 to +70°C, b
19.0-21.5 (0507-1.4S)	I	5	7	4	0.38	1.35	1.4	0.85 1.00	18	1.35:1 1.40:1	2	1	-30 to +70°C, -40 to +70°C, b
19.0-21.5 (0606-0.9S)	I	6	6	3.7	0.38	1.0	0.9	0.8	20	1.30:1	2	1	b
19.0-21.5 (0606-1.4S)	I	6	6	3.7	0.38	1.0	1.4	0.8	20	1.30:1	2	1	b
19.4-21.4	I	6	6	3.7	0.38	1.0	0.9	0.9 1.1	20 18	1.30:1 1.35:1		1	+15 to +35 -40 to +70, b
19.5-20.5	I	5	7	4	0.38	1.35	1.2	0.80	18	1.30:1	2	1	p
19.5-23.0	I	6	6	3.3	tba	1.0	tba	1.0	18	1.30:1	1	1	-10 to +50C,b
19.6-20.7	I	5	7	4	0.38	1.35	1.2	0.80	18	1.30:1	2	1	p
19.7-20.1	I	6	6	3.5				≤0.70	≥18	≤1.35:1	0.5	0.5	0 to +85C, ≤4g, b
19.7-20.2	I	5	7	4	0.38	1.35	1.2	0.80	18	1.30:1	2	1	p
20.2-21.2	I	6	6	4	0.38	1	1.25	0.8	18	1.30:1	1	1	p
21-23	I	6	6	3.3	tba	tba	tba	0.8	20	1.30:1	1	1	-10 to +50°C, b
21.1-21.3	I	6	6	3.3	0.50			0.9	18	1.30:1	2	2	-40 to +70°C, b
21.6-22.2	I	6	6	4	0.38	1.0	1.25	0.8 1.0	20 19	1.30:1 1.35:1		0.25	room -40 to +70C, b
21.6-22.25	I	6	6	4	0.38	1.0	1.25	0.8 1.0	20 19	1.30:1 1.35:1		0.25	room -40 to +70C, b
21.6-22.5	I	6	6	3.7				1.0	20	1.30:1		0.25	-10 to +60, b
21.9-24.1	I	6	5	3.7				1.0	20	1.30:1		0.5	-10 to +60, b
22-23	I/C	6	6	3.7	tba	tba	tba	0.7 0.8	20 18	1.30:1 1.35:1	1	1	room, -40 to +85, b
22-24	C	6	6	3.5	tba	tba	tba	0.8	19	1.25:1	2	0.2	-10 to +70, b
22-24	I	6	6	3.7	tba	tba	tba	0.9	20	1.30:1		0.25	-10 to +60, b
22-25	C	6	6	3.7	tba	tba	tba	0.9	20	1.30:1	1	1	-10 to +60, b
22-25	I	6	6	3.0	tba	tba	tba	1.1	20	1.30:1		1	-10 to +60, b
22-24 (4070)	C	6	6	3.5	tba	tba	tba	0.8	19	1.25:1	2	0.2	-40 to +70, b
22.5-25.0	C	6	6	4	0.25	1	1.25	0.8	18	1.30:1	2	0.2	b
22.6-23.6	I	6	6	2.9	0.38	1	0.95	0.8	20	1.30:1	1	0.2	-30 to +60°C, b
23-24	I	6	6	3.2	0.38	1.0	0.95	0.9	20	1.30:1	1	1	-10 to +60, b
23-24 (4070)	I	6	6	3.2	0.38	1.0	0.95	1.0	18	1.35:1	1	1	-40 to +70, b
23-25	C	6	6	4	0.25	0.75	1.25	0.8	18	1.30:1	2	0.2	b
23-25	I/C	6	6	3.3	tba	tba	tba	1.1	18	1.35:1	1	1	-40 to +70, b
23-25	I/C	6	6	3.7	tba	tba	tba	0.8	20	1.30:1	1	1	-10 to +60°C, b
23-25 (3060)	C	6	6	3.7	tba	tba	tba	0.9	18	1.30:1	6 Ave		-30 to +60°C, b
23-25	C	6	6	4	0.25	0.75	1.25	0.8	18	1.30:1	6	6	b
23-27	C	6	6	3.3	tba	tba	tba	1.2	17	1.35:1	1	1	-40 to +70, b
23-27	C	6	6	3.7	tba	tba	tba	0.9	18	1.30:1	2		-10 to +60, b

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Ferrite substrates on steel carriers.

Frequency GHz	I/C	W mm	L mm	H mm max	C mm Ref	N* mm	S +/- 0.035	In. loss (dB)	Isol. (dB)	VSWR	Pwr Fwd (W)	Pwr Rev (W)	Miscellaneous
23-28 2GHz max bw	C	6	6	3.4	tba	tba	tba	0.9	20	1.3:1	1	1	b
23-28 3GHz max bw	C	6	6	3.4	tba	tba	tba	1.1	20	1.35:1	1	1	b
23-29 3GHz max bw	I	6	6	3.0	tba	tba	tba	1.1	20	1.30:1		1	-10 to +60, b
23.1-23.6	I	6	6	3.4	0.38	1	1.4	0.9	20	1.25:1		0.5	-30 to +70°C, b
23.1-23.6	I	6	6	3.4	0.38	1	1.4	0.9	20	1.30:1	0.5	0.5	-40 to +50°C Storage Temp. -60 to +75°C, b
23.34-23.74	I	6	6	3.7	0.38	1.0		0.6 0.7	20 19	1.25:1 1.30:1	0.25	0.25	room -45 to +85C, b
23.5-24.5	C	6	6	3.7	0.38	1.0	1.0	0.9	20	1.30:1	10 (fwd+rev)		-10 to +50, b
23.5-24.5	C	6	6	3.7	0.38	1.0	1.0	1.1	20	1.25:1	1	1	b
23.55-24.05	I	6	6	3.5	tba	tba	tba	0.8	20	1.25:1	1	1	-30 to +70°C, b
23.8-24.8	C	6	6	3.0	tba	tba	tba	1.0	20	1.30:1		0.01	b
24.0-24.125	C	6	6	3.5	tba	tba	tba	0.7	20	1.25:1	0.25		-10 to +50, b
24.0-24.25	C	6	6	3.5	tba	tba	tba	0.7	20	1.25:1	0.25		-10 to +50, b
24.0-24.25	C	6	6	4	0.25	1	1.25	0.8	18	1.30:1	2	0.2	p
24.0-24.25	C	6	5	3.1	tba	tba	tba	0.9 1.0	19 18	1.25:1 1.30:1	0.03		-10 to +60 -30 to +70, b
24.0-24.3	C	6	6	3.2	0.38	1.5	.88	0.8	20	1.22	1	1	-10 to +60, b
24-26	C	6	6	3.7	tba	tba	tba	0.8	20	1.30:1	2		-10 to +60, b
24.0-28.5	I	6	5	2.8				1.1	20	1.30:1	1	1	b
24-30	C	6	5	2.9	tba	tba	tba	1.2	18	1.30:1	1	1	-10 to +50, b
24.05-26.05	C	6	6	3.7	tba	tba	tba	0.8	18	1.30:1	2	0.2	b
24.25-26.27	C	5	6	4	0.25	1	1.25	0.8	18	1.30:1	2	1	p
24.25-26.27	I	6	6	3.4	0.38	1	1.4	1	20	1.30:1	1	1	-10 to +70, b
24.5-26.5	I	5	5.5	3.5	tba	1.5	tba	0.6	17	1.40:1	10	1	-55 to +85, b
24-30	I	6	5	2.8	0.25	1.1 (Preliminary)	0.75	1.1	20	1.30:1	1	1	b
24-30	C	5	5	3.5	0.25	1.35	0.75	1.3	20	1.35:1	1	1	b 9-7-06
24-30	I/C	6	5	3.7	tba	tba	tba	1.2	17	1.35:1	1	1	-40 to +70, b
24-30	C	6	5	3.3	tba	tba	tba	1.2	18	1.3:1	1	1	-10 to +50, b
24-30	I	6	5	3.3	tba	tba	tba	1.1	19	1.3:1	1	1	-10 to +50, b
25-26	I	6	6	2.9	0.25		0.75	0.8 0.9	20 20	1.30:1 1.35:1	7.5	2	room -40 to +70°C, b
25-26	I	6	5	3.0	0.25	1.0	0.8	0.9	20	1.30:1	1	1	-10 to +60, b
25-26 (4070)	I	6	5	3.0	0.25	1.0	0.8	1.0	18	1.35:1	1	1	-40 to +70, b
25.0-26.1	I	6	6	2.9	0.25	1	0.75	0.9	20	1.30:1	3.0	1.0	-40 to +50°C Storage Temp. -60 to +75°C, b
25-27	C	6	6	2.9	0.25	1.0	0.75	0.9	20	1.30:1	2		-30 to +70, b
25-27	C	6	5	2.9	0.25	1.35	0.75	0.9	18	1.35:1	1	1	**b**
25-27	I	6	5	2.9	0.25	1.0	0.75	0.9	20	1.25:1		0.25	b
25-27	I	6	5	2.9	0.25	1.0	0.75	0.8 1.0	20 20	1.25:1 1.30:1	1	2	Room -20 to +60, b
25-27	I	6	5	2.9	0.25	1.0	0.75	0.9	20	1.30:1	2	2	-30 to +70, b
25.0-27.5	I	6	6	3.8	tba	tba	tba	0.8 1.0	21 18	1.30:1 1.35:1	3	10	-10 to +50 -55 to +85, b
25.2-28.2	I	6	5	3.7				1.1	20	1.30:1		0.5	-10 to +60, b
26-30	I/C	6	5	3.0	0.25		0.75	1.1	18	1.30:1	1	1	-10 to +50, b

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MSSM Metal Backed Substrate 2.0-50GHz (10% Bandwidth)

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Frequency GHz	I/C	W mm	L mm	H mm max	C mm Ref	N* mm	S +/- 0.035	In. loss (dB)	Isol. (dB)	VSWR	Pwr Fwd (W)	Pwr Rev (W)	Miscellaneous
26.5-40.0	I	6 5	6 5	2.9 2.9	0.25	1.1 (Preliminary)	0.75	1.7	15	1.50:1	1	1	b (proto)
27-29	C	4.5	4.5	3.0	0.25		0.75	1.0	20	1.30:1	2 CW		b
27-29	I	5	5	3.0	0.25		0.75	1.0	20	1.30:1	2 CW		b
27-31	I	5	5	2.9				0.9	20	1.30:1	2	1	-10 to +50, b
27.0-28.5	C/I	6	5	2.9				0.9	20	1.30:1	0.5	0.5	-10 to +60, b
27.25-31.70	I	5	5	3				1.0 1.2	18 17	1.30:1 1.40:1	1	1	room -30 to +60°C, b
27.25-31.70	C	5	5	3.3				1.2	18	1.35:1	5	1	b
27.525-28.325	C	4.5	4.5	2.9	tba	tba	tba	0.8	20	1.25:1	1	1	b
28-30	I	5	5	2.9	0.25	1.1	0.75	1.1	20	1.30:1	1	1	p
28-32	I/C	6	6	2.9	0.25	1.1	0.75	1.1	18	1.35:1	2	1	B 10/08/08
28-32	C	5	5	2.9	tba	tba	tba	1.1	18	1.30:1	1	1	-10 to +50, b
29.0-30.0	I	5	5	2.9	0.25	tba	0.75	0.9 1.0	23 20	1.30:1 1.35:1	4	4	room -40 to +70°C, b
29-31	I	5	5	2.9	0.25	tba	0.75	0.9	20	1.30:1		0.25	-10 to +60°C, b
29-31	I	6	5	2.9	0.25	1.1	0.75	1.0	20	1.30:1	1	1	-10 to +70, b
29-31 (3060)	I	5	5	3.1	tba	tba	tba	1.0	20	1.30:1	1	1	-30 to +60, b
29.0-31.5	I	5	5	2.9	0.25	tba	0.75	0.8	20	1.30:1	2	0.5	p
29.2-31.2	I	5	5	2.9	0.25	tba	0.75	0.9	20	1.30:1	1	1	-10 to +50, b
29.2-31.2	I	5	5	2.9	0.25	1.1	0.75	1.0 1.1	20 18	1.30:1 1.35:1		0.5	+15 to +35 -40 to +70, b
29.5-30.1	I	5	5	2.9	0.25	1.0	0.75	0.9 1.1	20 19	1.30:1 1.35:1		0.25	room -40 to +70C, b
29.5-30.15	I	5	5	2.9	0.25	1.1	0.75	0.9 1.1	20 19	1.30:1 1.35:1		0.25	room -40 to +70C, b
29.5-30.15	I	5	5	2.9	0.25	1.1	0.75	1.0	20	1.30:1		0.25	-10 to +60°C, b
29.5-30.5	I	5	5	2.9	0.25	1.1	0.75	1.0	20	1.30:1	2	1	P
29.5-31.5	I	5	5	2.9	0.25	1.1	0.75	1.0	20	1.30:1	1	1	b, -10 to +70
29.6-30.6 (121 stock)	I	5	5	2.9	0.25	1.1	0.75	0.9 0.8	20 19	1.30:1 1.30:1	2 2	2 2	-40 to+70C Gold plating 2.5 micrometer
29.6-31.6	I	5	5	2.9	0.25	1.1	0.75	0.9	20	1.20:1	1 or 2	0.2 or 0.5	-30 to +60°C, b
29.75-40.25	I	5	5	2.9	0.25	1.1 (Preliminary)	0.75	1.6	16	1.40:1	1 or 2	1 or 2	-10 to +60°C, b
30-31	I	5	5	2.9	0.25	tba	0.75	1.0 1.1 1.2	20 19 18	1.30:1 1.35:1 1.40:1	2	2	room -30 to +60°C, p -55 to +70C, b -55 to +85C storage
30-31	I	5	5	2.9	0.25	1.1	0.75	1.0 1.1	20 18	1.30:1 1.35:1		2	room -30 to +70, b
30-32	I	5	5	3	tba	1.1	tba	1.0	20	1.3:1	1	1	-10 to +50C, b
30-36 (4GHz bw max)	I	5	5	2.9	0.25	tba	0.75	1.1	17	1.35:1		1	-10 to +60, b
30-40	I	5	5	2.9	0.25	tba	0.75	1.4	16	1.60:1		2	-10 to +50, b
31-32	I	5	5	2.9				0.9	20	1.30:1		0.5	-10 to +60, b
31-33	I	5	5	2.9	0.25	1.1	0.75	1.0	20	1.35:1	1	0.25	p
31-33	I	5	5	3.6	tba	tba	tba	1.0	20	1.35:1	1	1	-30 to +60°C, b
31-33	C	5	5	3.5	tba	tba	tba	1.0	18	1.40:1	4		-30 to +50°C, b
31-34 -b	I	6	5	2.9	0.25	1.1	0.75	1.0	20	1.35:1	1	1	b -30 to +65°C
31-34 -e	I	6	5	2.9	0.25	1.0	0.75	1.0	20	1.35:1	1	1	e -30 to +65°C
31-36	C	4.5	4.5	3.0	0.2	1.5	0.75	1.2	17	1.35:1	5		-10 to +60, b

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31-41	I	5 6	5 6	3.3 3.3	tba	tba	tba	1.7	16	1.50:1	1	1	b
31.25-31.75	I	5	5	2.9	0.25	tba	0.75	0.9	20	1.30:1	1	1	-30 to +70°C, b
31.5-32.5	I	5	5	2.9	0.25	tba	0.75	1.0 1.1	20 19	1.30:1 1.35:1	1	1	room -30 to +60°C, b
31.5-34.1	I	5	5	3.6				1.1	20	1.35:1	1	1	-30 to +60°C, b
31-36	C	4.5	4.5	2.3				1.2	18	1.35:1	2, 5	2	-10 to +60, p
31.5-36.0	C	5	5	3	0.25		0.8	1.1 1.3	17 15	1.35:1 1.50:1	2	2	room -40 to +70
31.5-36.0	I	5	5	3	0.25		0.8	1.1 1.3	20 18	1.35:1 1.45:1	2	2	room -40 to +70
31.5-36.0	I	5	5	2.8	tba	tba	tba	1.1 1.2	18 17	1.35:1 1.40:1		1, 2	0 to +50 -30 to +60
31.5-36.0 (Preliminary)	C	5	5	2.8	tba	tba	tba	1.1 1.2	18 17	1.35:1 1.40:1		1	0 to +50 -30 to +60
32-33	I	5	5	3.3	0.25	1.1	0.75	0.9	20	1.30:1	1	0.2	-30 to +60°C, b
32-34	I	5	5	2.9	0.25	tba	0.75	1.0	20	1.35:1	1	0.25	-10 to +60C, b
32-34	I	6	5	2.9	0.25	1.0	0.75	0.9	20	1.35:1	2	1	-30 to +70
32-34	I	5	5	2.9	0.25	tba	0.75	1.0	23	1.35:1	0.25	0.25	-40 to +70, b
32-34	I	5	5	2.9	0.25	1.1	0.75	1.0 1.1	20 18	1.30:1 1.35:1	1	1	-10 to +60C -40 to +70, b
32-35	I	5	5	3.3	tba	tba	0.5	1.0	20	1.35:1	2	1	-10 to +60C, b
32-36	C	5	5	2.9				1.1 1.3	16 14	1.4 1.6	10		-10 to +50C -40 to +85C, b
32-36	C	4.5	4.5	3.2	tba	1.5	0.72± 0.05	1.0 1.2	18 17	1.30:1 1.35:1	1		10 to +60C -40 to +70C, b
32-38	I	5	5	2.9				1.2 1.3	17 16	1.35:1 1.40:1	0.5	0.5	room -10 to +60C, b
32-38	I	5	5	3.1	0.20	1.1	0.5	1.4	17	1.40:1	4	4	b
32.5-35.5	I	5	5	3.3	tba	tba	0.5	1.0	20	1.35:1	5		-10 to +60C, p
32.5-35.5	C	4.5	4.5	3.7	tba	tba	tba	1.1	18	1.30:1	5		0 to +50C,b
33-33.5	C	5	5	2.3	0.20	1.1	1.25	1.0	20	1.25:1	5	0.5	draft p
33-35	I	4.5	4.5	2.3	0.20	1	1.25	1.2	18	1.35:1	2	1	
33-35	C	4.5	4.5	2.3	0.20	1	1.25	1.2	18	1.35:1	5	5	
33-36	C	4.5	4.5	3.0	tba	tba	tba	1.1	18	1.30:1	1, 2	1, 2	-10 to +60, b
33-36	C	4.5	4.5	3.0	tba	tba	tba	1.2	18	1.30:1	6 Ave		-30 to +60, b
33-36	C	4.5	4.5	2.8	0.20	1.5	0.70	1.1	20	1.35:1	5 or 6	5 or 6	b 4/17/08 (storage-60 to 85c)
33-36	C	4.5	4.5	2.9	tba	tba	tba	1.1	20	1.35:1	4		-10 to +60, b
33-36	I	5	5	2.9	0.5	1.1	0.75	1.1 1.3	20 18	1.35:1 1.40:1	1	1	room -30 to +70°C
33-36	I	5	5	2.9	0.2	1.1	0.7	1.1 1.2	20 18	1.35:1 1.40:1		0.5, 1	-10 to +60C, b -45 to +85C
33-37	I	5	5	2.9				1.1	20	1.35:1	0.1	0.1	-10 to +60C,b
33-37	I	5	5.5	4	0.20	tba	1.25	1.2	18	1.35:1	1	1	p
33-37 (4070)	C	4.5	4.5	3.2	0.20	1.5	0.72±0 .05	1.0 1.2	18 17	1.30:1 1.35:1	4		-10 to +60 -40 to +70, b
33-38	I	5	5	3.2				1.3	19	1.35:1		0.25	0 to +60°C, b
33-38	I	5	5	3.3	tba	tba	tba	1.2	17	1.4		1	-10 to +50°C, b

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33-38	C	4.5	4.5	3.3	tba	tba	tba	1.2	18	1.35:1	4		b
33-37	C	4.5	4.5	3.5	tba	1.35	1.25	1.2	18	1.35:1	5		SO 10179
33-45	I	6 or 5	6 or 5	3.3	tba	tba	tba	1.8	16	1.50:1	1	1	b (proto)
33.3-34.1	I	5	5	2.9	0.25	tba	0.75	1.1 1.2	20 19	1.30:1 1.35:1	1	1	room -30 to +60°C, b
33.4-36	C	4.5	4.5	2.8				1.1	23	1.30:1	1	1	b
33.0-35.5	C	5	5	3.5	0.20	1.5	1.2	1.2	17	1.40:1	5	5	p
33.5-34.5	C	4.5	4.5	3.5	0.20	1	1.2	1.2	17	1.40:1	6	6	p
33.5-35.5	C	4.5	4.5	3.5	0.20	1.5	1.2	1.2	17	1.40:1	6	6	B 1.1/18/1.3 at RT (storage-60 to 85c)
33.5-35.6	I	5	5	3.2				1.1	20	1.35:1		0.25	0 to +60°C, b
33.5-35.6	C	4.5	4.5	2.4	0.20	tba	0.7	1.1	18	1.30:1	6	6	-10 to +70, b
33.5-36.5	I	5	5	3.2	tba	tba	tba	1.1	20	1.33:1		0.25	0 to +60°C, b
33.8-36.2	I	5	5	tba	tba	tba	tba	1.0	20	1.30:1		0.25	-40 to +70°C, b
34-35	C	4.5	4.5	3.0	tba	tba	tba	1.2	18	1.30:1	4	4	-40 to +70°C
34-36	I	5	5					1.0	20	1.30:1		0.25	-40 to +70°C, b
34-36	I	5	5	2.9	0.20	tba	0.7	1.0	20	1.30:1	1	1	
34-36	I	5	5	2.9	0.2	tba	0.7	1.0 1.1 1.2	20 18 18	1.35:1 1.40:1 1.40:1	3	2	room -40 to +70°C, b -55 to +70C, b (-55 to +85C storage).
34-36 (3060)	I	5	5	3.6	tba	tba	tba	1.0	20	1.35:1		2	-30 to +60°C, b
34-36 (5x5)	C	5	5	2.9	0.20	1.37	0.7	1.0	20	1.30:1	2	1	
34-36	C	4.5	4.5	3.3	0.20	1.37	1.3	1.0	20	1.30:1	3	3	-30 to +70°C
34-36 (4070)	C	5	5	3				1.2	18	1.30:1	4 (peak)	2	-40 to +70°C, b
34-36 (4070)	I	4.5	4.5	3				1.1	18	1.30:1	4 (peak)	2	-40 to +70°C, b
34-36	C	4.5	4.5	3.0	0.5	tba	tba	1.0 1.2	20 18	1.30:1 1.35:1	2	2	room -40 to +75, b
34-36	C	4.5	4.5	3.0	tba	tba	tba	0.9	20	1.30:1	5		room -10 to +60, b
34-36 (3070)	C	4.5	4.5	3.3	tba	tba	tba	1.0	20	1.35:1	2	2	-30 to +70, b
34-36 (3060)	I	5	5	3.6	tba	tba	tba	1.0	20	1.35:1	0.25 or 1	0.25 or 1	-30 to +60, b
34-36 (4075)	I	5	5	2.9	tba	tba	tba	1.0	20	1.30:1	1	1	-40 to 75, b
34-36	C	5	5	2.9	tba	tba	tba	1.1	18	1.35:1	3	3	-40 to +85, b
34.15-34.25	C	4.5	4.5	3.3	tba	tba	tba	0.7	20	1.25:1	1	1	-10 to +60, b
34.15-34.25	I	5.0	5.0	3.3	tba	tba	tba	0.7	20	1.25:1	1	1	-10 to +60, b
34.35-34.65 34.5-35.5 34.6-35.5	C	4.5	4.5	3.3	0.20	1.5	1.2	0.7 0.9	23 20	1.20:1 1.30:1	5	5	room P -30 to +50 P magnet 1.3mm dia, center 2.2mm from top
34.35-34.65 (-1060)	C	4.5	4.5	3.0	tba	tba	tba	0.9	19	1.25:1	5		-10 to +60, b
34.5-35.5 -min (evj)	C	3.5	4.0	2.85	0.20	0.7	0.7	0.9 1.0	18 20	1.30:1	2	2	room temp -30 to +70C,-30 to +90C b pad width 0.14mm
34.5-35.5 (1W)	C	4.5	4.5	3.7	0.25	1.0	0.67	1.0	19	1.30:1	1	1	-30 to +70, b, Hyu
34.5-35.5 (1W)	C	4.5	4.5	3.7	0.25	**1.0**	0.67	0.9	23	1.2:1	1	1	-30 to +70, b

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34.5-35.5 (2W)	C	4.5	4.5	3.3	0.7	1.5	1.2	1.0	20	1.35:1	2	2	-30 to +60°C, b
34.5-35.5 (6W)	C	4.5	4.5	3.3				1.0	20	1.35:1	6	6	-40 to +60, b (-40 to +85C storage)
34.5-35.5	I	5	5	3.6		1.25		1.0	20	1.35:1	1, 0.25	1, 0.25	-30 to +60°C, b
34.7-38.3	I	5	5	3.2	0.2	1.1	1.25	1.1	17	1.35:1	1	0.25	
34.8-35.2	C	4.5	4.5	2.9	tba	tba	tba	1.0	18	1.30:1	1	1	-40 to +71°C, b (Storage temp. -54 to +71°C)
35.5-38.0	I	5	5	3.2	0.2	1.1	1.25	1.1	17	1.35:1	1	0.25	-40 to +85°C
35-36	I	5	5	2.9	0.2		0.5	0.9 1.0	20 19	1.25:1 1.30:1	10	2	+25 -30 to +70, b
35.0-36.7 (4085)	C	4.5	4.5	tba	tba	tba	tba	0.9 1.1	18 17	1.30:1 1.40:1	1		+25 -40 to +85, b
35.0-36.7	C	5	5	3.6	tba	tba	tba	1.2 1.3	18 17	1.30:1 1.35:1	1	1	room -10 to +70, b
35.0-36.7 (4070)	C	5	5	3.6	tba	tba	tba	1.2 1.3	18 17	1.30:1 1.35:1	1	1	room -40 to +70, b
35-39	I	5	5	3.3				1.2	18	1.30:1	2	2	b
35-39	I	5	5.5	4	0.5	1.35	0.7	1.3	17	1.40:1	2	2	-40 to +70.e
35.0-40.0	C	4.5	4.5	3.3				1.2	18	1.35:1	1	1	room, b
35.0-40.0	I	5	5	3	0.20	1.1 (Preliminary)	0.70	1.2	19	1.35:1	1	1	-10 to +60°C, b
35.5-36.0	I	5	5	3.2	tba	tba	tba	0.9	20	1.30:1	1	1	-30 to +70°C, b
36.5-37.3	C	5	5	3.2	0.2	1.1	1.25	1.1	17	1.35:1	5		p
36.5-37.3	I	5	5	3	tba	tba	tba	1.0	20	1.35	1.5	1	-30 to +60, b
35.7-36.7	C	4.5	4.5	3.7	tba	tba	tba	0.9	18	1.30:1	2		-40 to +85, b
36.6-38..4	I	5	5	3.2	0.2	1.1	1.25	1.1	17	1.35:1	1	0.25	p
36.7-37.0	C	4.5	4.5	3	0.20	1.5	0.5	0.9 1.1	20 18	1.25:1 1.35:1	1	1	room -40 to +85, b
37.0-40.0	I	5	5	3.3	0.20	1	0.7	1.0	20	1.31:1	1	0.5	b
37.0-40.0	C	4.5	4.5	2.8	tba	tba	tba	1.1	20	1.30:1	1	1	b
37-38	I	6	5	4	0.20	tba	0.7						
37-39	I	6	5	4	0.20	tba	0.7						
37.5-39.0	I	5	5	3.3				1.2	18	1.30:1	2	2	b
37.5-39.5	I	5	5	3.3				1.0 1.1	20 18	1.35:1 1.35:1	1	1	room -30 to +70, b
38-40	C	5	5	3	tba	tba	tba	1.0	20	1.30:1	2	1	-10 to +60°C, b
38-40	I	5	5	4	0.2	1.1	1.2	1.1	17	1.35:1	2	1	
38-42	I	5	5	4	0.2	1.1	1.2	1.1	17	1.35:1	2	1	
38.5-41.5	I	5	5	3	0.25		0.8	1.1 1.3	20 18	1.35:1 1.40:1	2	1	room -30 to +70, b
38.6-40.0	C	4.5	4.5	3.1	tba	tba	tba	0.9 1.0	18 17	1.30:1 1.35:1	2	2	room -10 to +60, b
39.8-40.2	I	5	5	2.8	tba	tba	tba	1.1	20	1.30:1	1	1	-30 to +60C, b
40.5-42.5	I	5	5	3.2	0.2	1.1	0.7	1.2	17	1.35:1	1	0.25	
40.5-42.5	I	5	5	3.0				1.2	20	1.35:1	1	1	-10 to +60C, b
40.5-42.5	C	4.5	4.5	3.3	0.2 +/- 0.015	1.1 +/- 0.05	0.7 +/-0.15	1.1 1.3	20 18	1.35:1 1.40:1	1	1	+25 -30 to +60C, b
40.5-43.5	C	5	5	2.8	0.2	1.1	0.7	1.2	20	1.30:1	1	1	-30 to +60, b
41.0-43.0	I	5	5	3.2	0.2	1.1	0.7	1.2	17	1.35:1	1	0.25	-40 to +85°C
41-43	I	5	5	3.0	tba	tba	tba	1.3	18	1.30:1	1	1	-10 to +50, b

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MSSM Metal Backed Substrate 2.0-50GHz (10% Bandwidth)

Ferrite substrates on steel carriers.

Frequency GHz	I/C	W mm	L mm	H mm max	C mm Ref	N* mm	S +/- 0.035	In. loss (dB)	Isol. (dB)	VSWR	Pwr Fwd (W)	Pwr Rev (W)	Miscellaneous
41.925-42.075	I	5	5	3	tba	tba	tba	1.2	20	1.30:1	1	1	-30 to +60C, b
42.1-42.3	I	5	5	3.2	0.2	1.1	0.7	0.9	20	1.30:1	2	0.5	-40 to +85°C
42.1-42.3	I	5	5	3.2	0.2	1.1	0.7	1.1	20	1.30:1	2	2	-40 to +85°C
43-46	I	5	5	3.3	0.2	1.1	0.5	1.3	18	1.30:1	1	0.25	-10 to +60°C
43-46 (-4070)	I	5	5	3.3	tba	tba	0.5	1.3	18	1.30:1	1	1	-40 to +70°C, b
44.0-45.2	I	5	5	2.8	tba	tba	tba	0.3	20	1.20:1	2	2	-10 to +60°C, b

MSSM-HDI-b only **Option (Part # suffix-HDI)**

Opt	Description	Instruction
HDI	**High temperature soldering / curing**	**Temperature 200 °C max for 30 seconds Max.**

RADC-34.5-35.5-MSSM-2WR-HDI* Circulator

Frequency GHz	I/C	W mm	L mm	H mm max	C mm Ref	N* mm	S +/-0.035 (+/-0.0014)	In. loss (dB)	Isol. (dB)	VSWR	Pwr Fwd (W)	Pwr Rev (W)	Miscellaneous
34.5-35.5	C	3.5	4.0	2.3	0.20	0.7	0.7	1.0	20	1.30:1	2	2	E pad width 0.14mm -30 to +70C
Potential, needs a high volume for design													
34-36	C	4.5	4.5	3.3				1.0	20	1.30:1	2	2	-30 to +70C , b

- **MSSM unit may be mounted on any metal base (Ferrous or Non Ferrous / ie: Steel or Aluminum)**

Extended Temperature range

At -40C or 80 °C, add 0.1 dB to Insertion Loss, and subtract 1.0 dB from Isolation
At 85 °C, add 0.2 dB to Insertion Loss, and subtract 2.5 dB from Isolation
At 90C °C, add 0.3 dB to Insertion Loss, and subtract 4.0 dB from Isolation
At 100C °C, add 0.4 dB to Insertion Loss, and subtract 5.0 dB from Isolation
Higher temperature parts with better specs are available

Installation instruction for MSS and MSSM Isolators and Circulators.

These models contain low melting point, Indium fine tuning elements and unit should be mounted using an Indium based solder ***or*** *clear epoxy, as a secondary operation, in strict compliance with the following:*

1**. All Microstrip Isolators and Circulators have pure indium tuning elements** that can be damaged by sustained temperatures over 130°C, (Indium melting point is 156°C). So under no circumstances should unit ever exceed 130°C

2. **Preferred attachment for the MSS and MSSM models** is by using a thin smear of clear non conductive epoxy, with temperature of polymerization close to 80°C, it is important to leave area around microstrip junctions clear to facilitate grounding. We do not recommend conductive epoxies as it is too easy to contaminate the isolator surface and detune/damage the unit.

3. **Alternate attachment for MSS and MSSM model** is by soldering, (Soldering is a more complicated process, but Insertion loss at frequencies over 12 GHz can be a little better than with epoxy)

- *Note the substrates come soldered to a metal back plate. Mounting can only be with low melting point indium solder*
- Fitting is by using a Indium paste solder (we suggest Lead free: 50% Indium / 50% Tin Alloy) with 125°C liquidus.
- Use a controlled solder reflow cycle of up to 125°C for 5 seconds maximum, with slow up and down ramps. (do not use a hot plate due to the inability to control-it will likely melt the Indium and even desolder the ferrite substrates)

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4. **Recommended Interconnection is by non ultrasonic wedge bonding**,

- Heat the unit to a maximum of 100°C for <3 minutes
- Maximum wedge temperature during the bonding process 350°C for 25ms

5. Cavity Effect: Minimum distance between the housing/module cover: 1.0 - 1.5mm above the magnet without any change in performances. and about 0.7mm with minimum changes.

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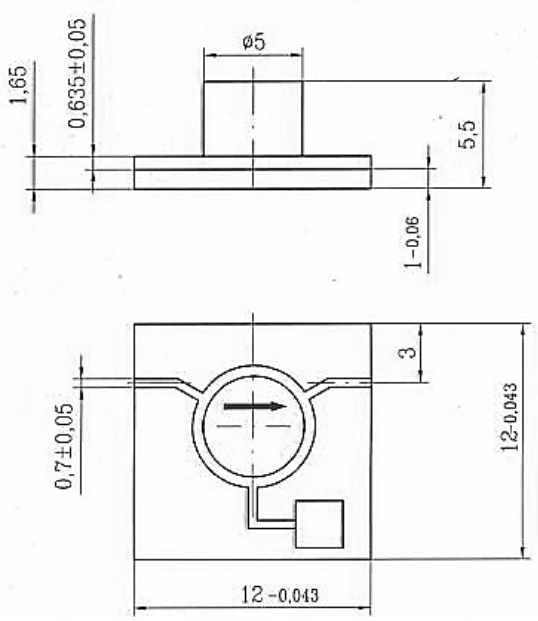
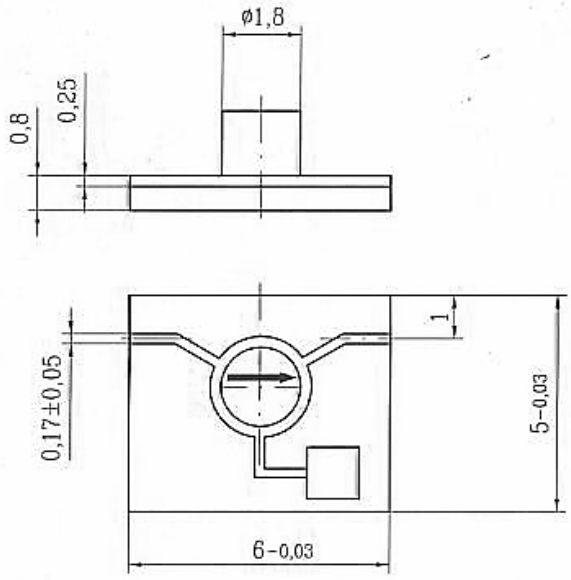
MSSM Metal Backed Substrate 2.0-50GHz (10% Bandwidth)

Ferrite substrates on steel carriers.

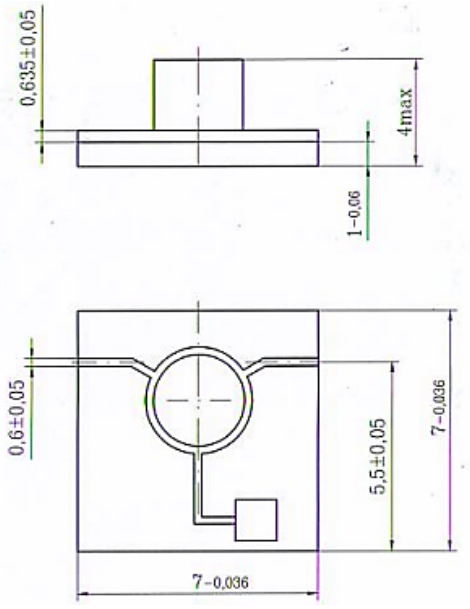
Outline: RADI-5.25-6.75-MSSM-2WR-b



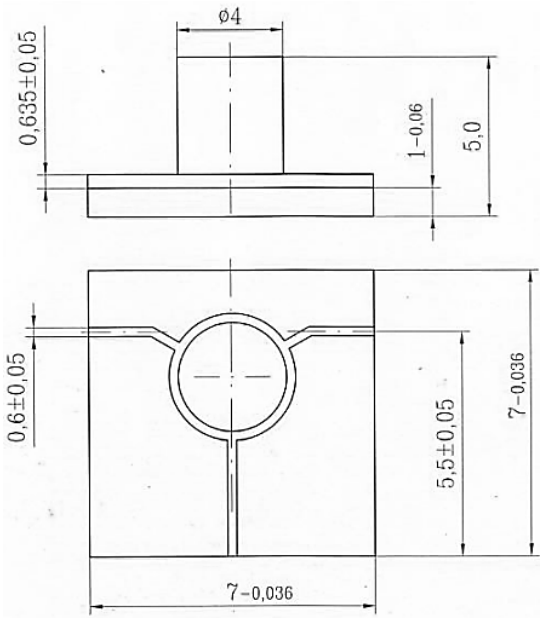
Outline: RADI-25-27-MSSM-2WR-b



Outline: RADI-13.75-14.5-MSSM-1WR (4065)



Outline: RADC-9-10-MSSM-20WL-0707-b



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