Multilayer Organic (MLO™)

0603 GPS/WLAN Diplexer

MLO™ TECHNOLOGY

The 0603 diplexer is a best in class low profile multilayer organic passive device that is based on AVX's patented multilayer organic high density interconnect technology. The MLO™ diplexer uses high dielectric constant and low loss materials to realize high Q passive printed elements such as inductors, and capacitors in a multilayer stack up. The MLO™ diplexers can support multiple wireless standards such as WCDMA, CDMA, WLAN, GSM, GPS and BT. These diplexers are less than 0.5mm in height and are ideally suited for band switching for dual band systems. All diplexers are expansion matched to printed circuit boards thereby resulting in improved reliability vs. ceramic and Si components.

APPLICATIONS

Multiband applications including WiFi, WiMax, GPS, and cellular bands

LAND GRID ARRAY ADVANTAGES

- Inherent Low Profile
- Excellent Solderability
- Low Parasitics
- High Heat Dissipation

HOW TO ORDER

DP	03	C	1580	T	TR
Type	Size	Design	Frequency (MHz)	Finish 7 = Au T = NiSn	Packaging Tape & Reel

QUALITY INSPECTION

Finished parts are 100% tested for electrical parameters and visual characteristics.

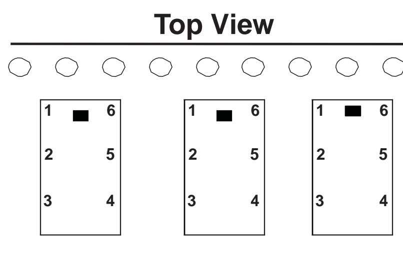
OPERATING TEMPERATURE

-40ºC to +85ºC

TERMINATION

Finishes available in NiSn and immersion Au coatings which are compatible with automatic soldering technologies which include reflow, wave soldering, vapor phase and manual.

ORIENTATION IN TAPE



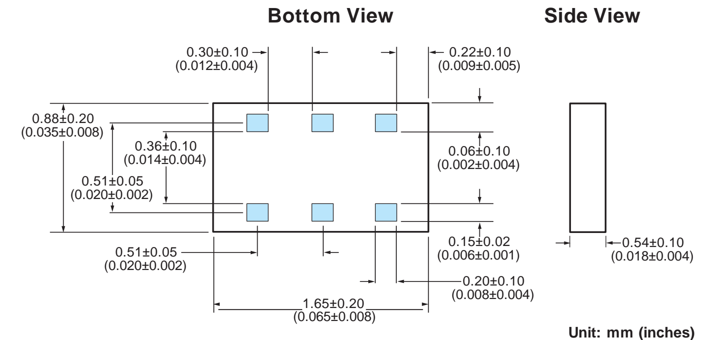
POWER CAPACITY

4.5W Maximum

Mechanical Characteristics @25ºC

Size [mm(inches)]	1.65 x 0.88 (0.065 x 0.035)
Height [mm(inches)]	0.54 (0.021)
Volume (mm^3)	0.77

COMPONENT DIMENSIONS AND FUNCTIONS



Unit: mm (inches)

Terminal No.	Terminal Name
1	GND
2	Common
3	GND
4	Low Frequency Port
5	GND
6	High Frequency Port

PART NUMBER: DP03C1580TTR

GPS/WLAN Electrical Characteristics @25ºC

Low-Band

Parameter	Freq. (MHz)	Spec @ 25ºC	Typ.	Unit
Insertion Loss	704-960	0.4 max	0.3	dB
	1562-1580	1.2 max	1.0	dB
	1559-1606	1.2 max	1.0	dB
VSWR	704-960	1.9 max	1.1	-
	1562-1580	1.9 max	1.4	-
	1559-1606	1.9 max	1.3	-
Isolation	500-1606	20 min	16	dB
Attenuation	2300-2400	15 min	20	dB
	2496-2600	15 min	30	dB
	2620-2690	10 min	30	dB
	4900-5150	20 min	30	dB
	5150-5850	20 min	22	dB
	5850-5950	20 min	22	dB

High-Band

Parameter	Freq. (MHz)	Spec @ 25ºC	Typ.	Unit
Insertion Loss	2300-2400	0.80 max	0.70	dB
	2496-2600	0.65 max	0.55	dB
	2620-2690	0.55 max	0.45	dB
	4900-5150	0.5 max	0.20	dB
	5150-5850	0.5 max	0.35	dB
	5850-5950	0.5 max	0.30	dB
VSWR	2300-2400	1.9 max	1.4	-
	2496-2600	1.9 max	1.3	-
	2620-2690	1.9 max	1.3	-
	4900-5150	1.9 max	1.2	-
	5150-5850	1.9 max	1.2	-
	5850-5950	1.9 max	1.2	-
Isolation	2496-2690	25 min	28	dB
	4900-5950	20 min	25	dB
Attenuation	704-960	15	22	dB
	1562-1580	20	21	dB
	1559-1606	15	17	dB

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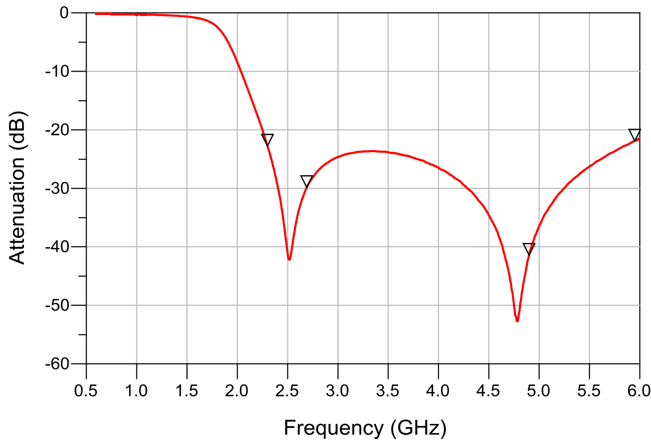
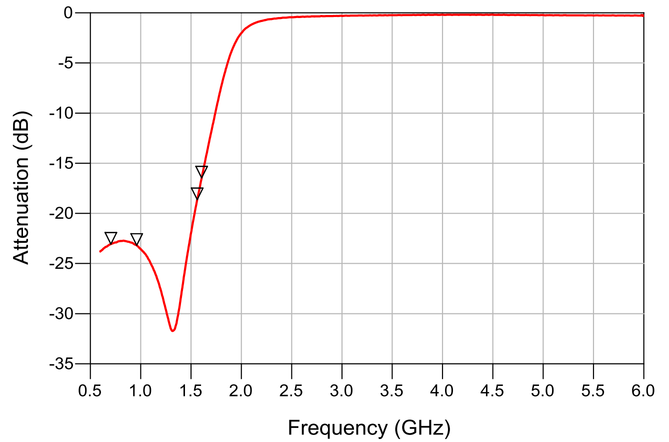
S PARAMETER MEASUREMENTS

LOW BAND PORT ATTENUATION



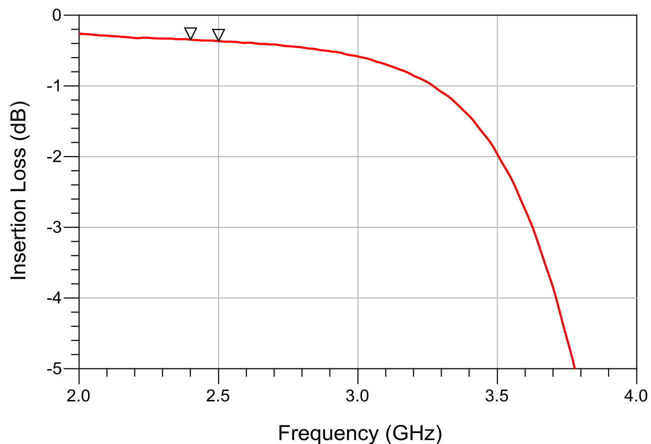
Low-Band Attenaution	
Frequency (GHz)	Attenuation (dB)
2.300	22.76
2.690	29.84
4.900	41.44
5.950	21.92

HIGH BAND ATTENUATION



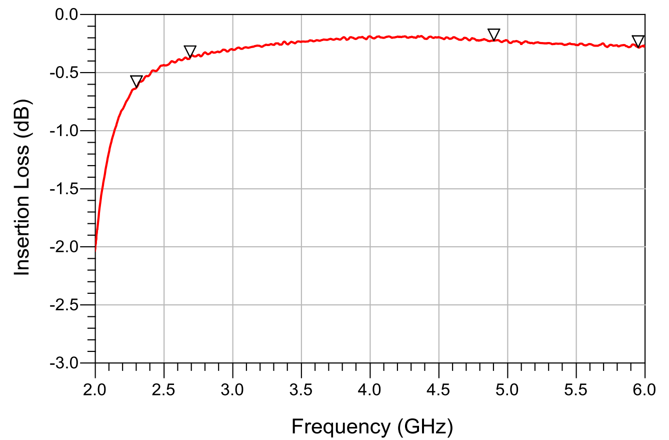
High-Band Attenaution	
Frequency (GHz)	Attenuation (dB)
0.704	23.06
0.960	23.18
1.562	18.63
1.606	16.47

LOW BAND INSERTION LOSS



Low-Band Insertion Loss	
Frequency (GHz)	Attenuation (dB)
0.704	0.204
0.960	0.266
1.562	0.771
1.606	0.897

HIGH BAND INSERTION LOSS



High-Band Insertion Loss	
Frequency (GHz)	Attenuation (dB)
2.300	0.628
2.690	0.370
4.900	0.224
5.950	0.283

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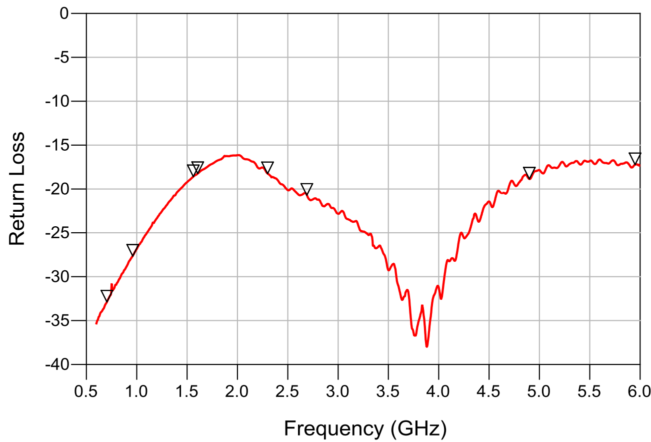
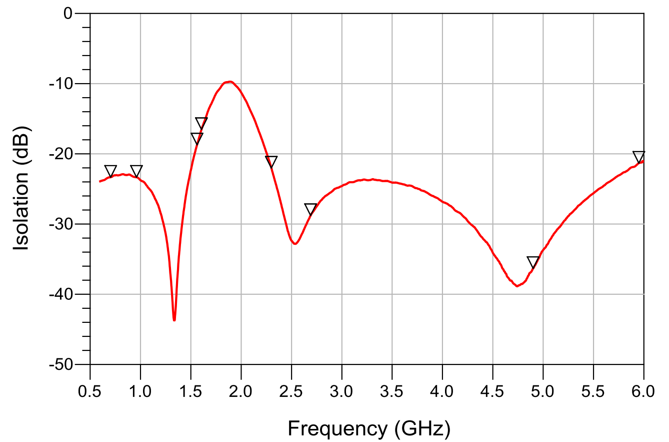
S PARAMETER MEASUREMENTS

COMMON PORT RETURN LOSS



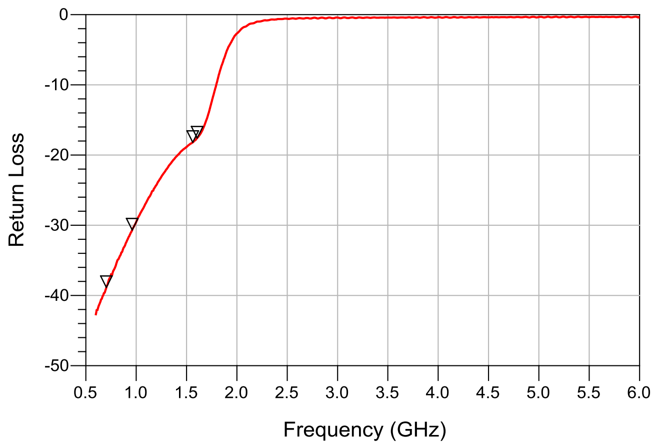
ISOLATION



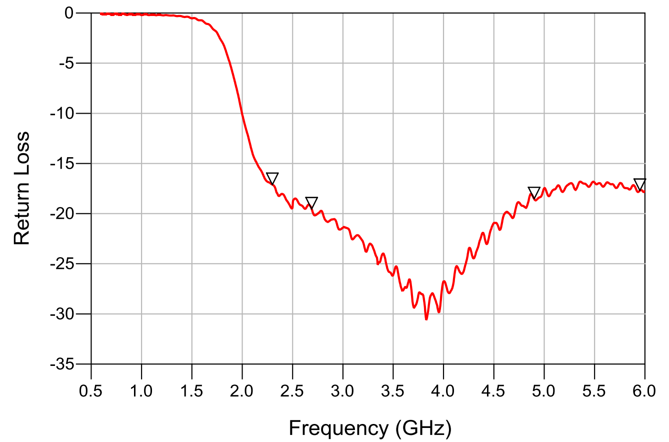
Common Port Return Loss	
Frequency (GHz)	Attenuation (dB)
0.704	32.87
0.960	27.65
1.562	18.59
1.606	18.25
2.300	18.25
2.690	20.71
4.900	18.87
5.950	17.24

Isolation	
Frequency (GHz)	Attenuation (dB)
0.704	23.32
0.960	23.33
1.562	18.71
1.606	16.53
2.300	22.02
2.690	28.77
4.900	36.31
5.950	21.32

LOW BAND RETURN LOSS



HIGH BAND RETURN LOSS



Low-Band Return Loss	
Frequency (GHz)	Attenuation (dB)
0.704	38.86
0.960	30.68
1.562	18.19
1.606	17.57

High-Band Return Loss	
Frequency (GHz)	Attenuation (dB)
2.300	17.11
2.690	19.54
4.900	18.53
5.950	17.70

AUTOMATED SMT ASSEMBLY

The following section describes the guidelines for automated SMT assembly of MLO™ RF devices which are typically Land Grid Array (LGA) packages or side termination SMT pacages.

Control of solder and solder paste volume is critical for surface mount assembly of MLO™ RF devices onto the PCB.

Stencil thickness and aperture openings should be adjusted according to the optimal solder volume. The following are general recommendations for SMT mounting of MLO™ devices onto the PCB.

SMT REFLOW PROFILE

Common IR or convection reflow SMT processes shall be used for the assembly. Standard SMT reflow profiles, for eutectic and Pb free solders, can be used to surface mount the MLO™ devices onto the PCB. In all cases, a temperature gradient of 3°C/sec, or less, should be maintained to prevent warpage of the package and to ensure that all joints reflow properly. Additional soak time and slower preheating time may be required to improve the out-gassing of solder paste. In addition, the reflow profile depends on the PCB density and the type of solder paste used. Standard no-clean solder paste is generally recommended. If another type of flux is used, complete removal of flux residual may be necessary. Example of a typical lead free reflow profile is shown below.

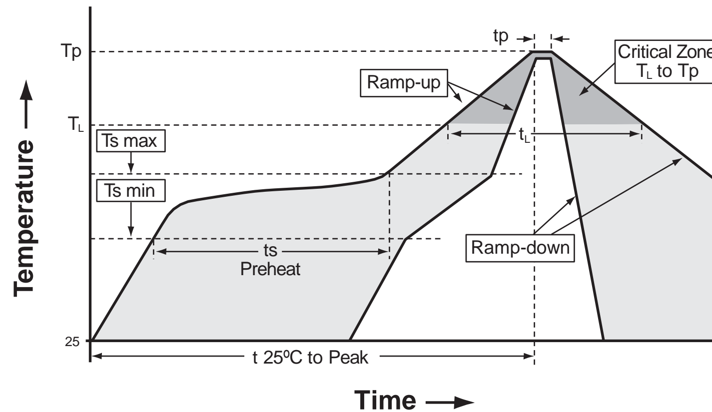
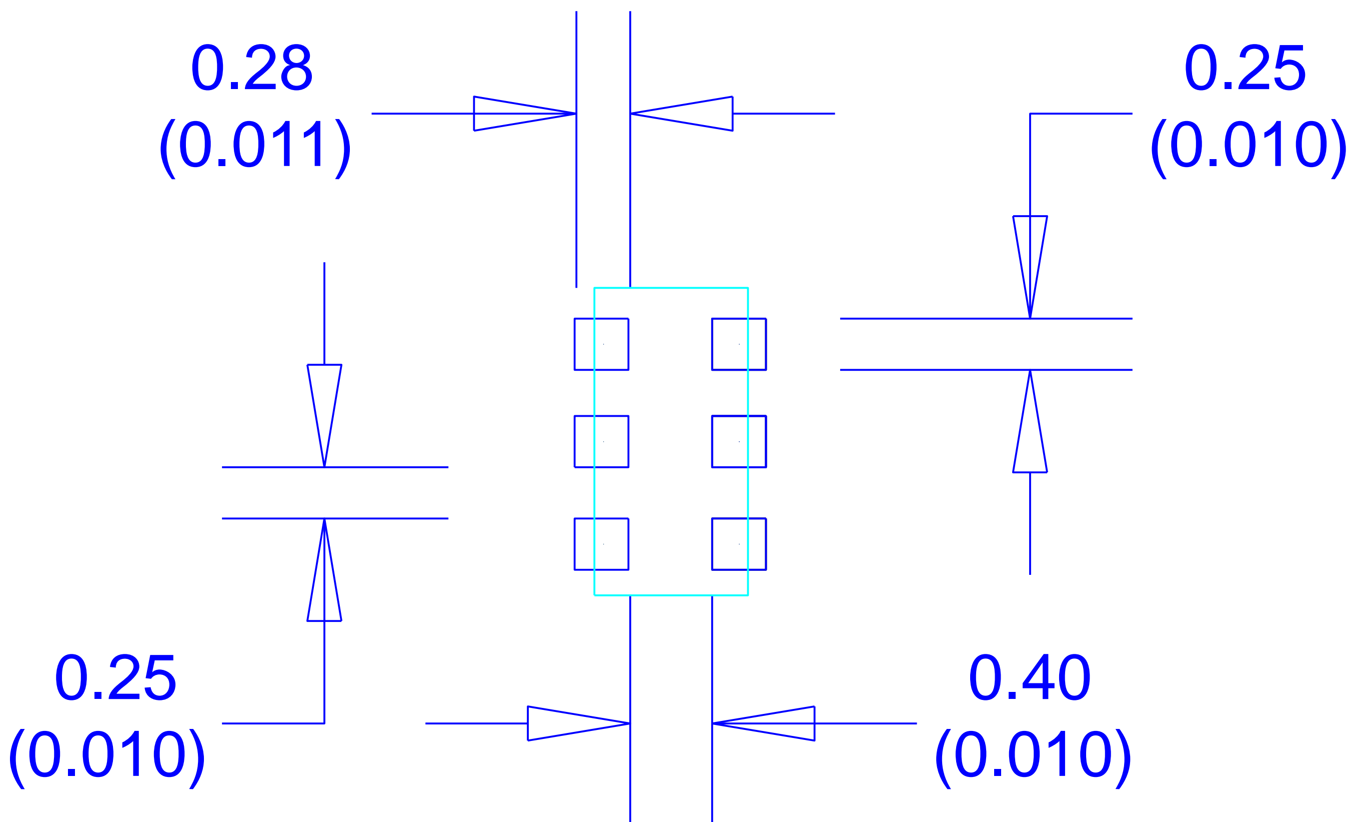


Figure A. Typical Lead Free Profile and Parameters

Profile Parameter	Pb free, Convection, IR/Convection
Ramp-up rate (Tsmax to Tp	3ºC/second max.
Preheat temperature (Ts min to Ts max)	150ºC to 200ºC
Preheat time (ts)	60 – 180 seconds
Time above T_L, 217ºC (t_L)	60 – 120 seconds
Peak temperature (Tp)	260°C
Time within 5ºC of peak temperature (tp)	10 – 20 seconds
Ramp-down rate	4ºC/second max.
Time 25ºC to peak temperature	6 minutes max.

RECOMMENDED PAD LAYOUT



All dimensions are in mm (inches)
unless otherwise specified.