Multilayer Organic (MLO™)

0603 WLAN/BT 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, 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	A	2450	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.

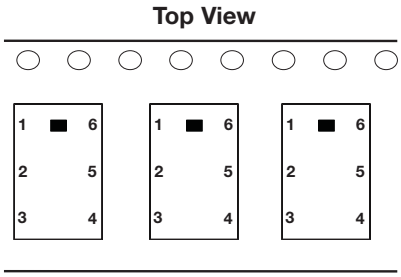
OPERATING TEMPERATURE

-40ºC to +85ºC

TERMINATION

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

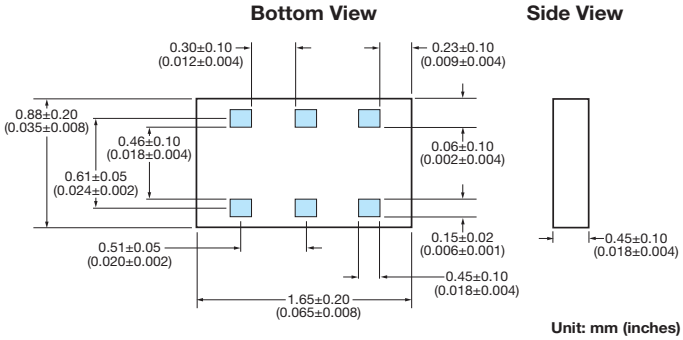
ORIENTATION IN TAPE



POWER CAPACITY

4.5W Maximum

COMPONENT DIMENSIONS AND FUNCTIONS



Unit: mm (inches)

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

PART NUMBER: DP03A2450TTR

Electrical Characteristics @ 25ºC

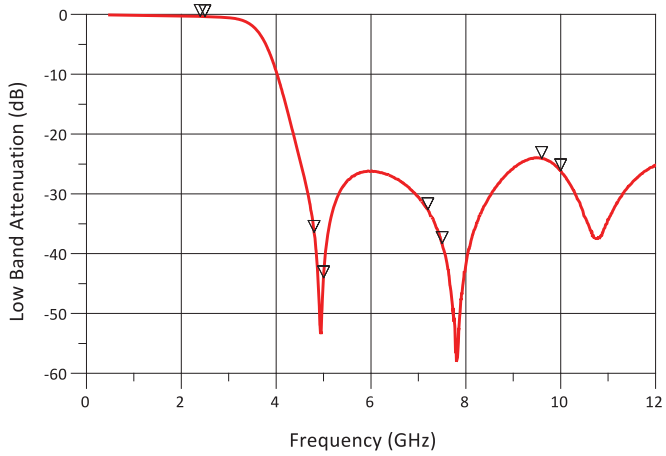
No.	Parameter	Freq. (MHz)	Port	Specification	Typ. value	Unit
1	Insertion Loss	2400-2496	Low	0.40 max	0.35	dB
2		4900-5950	High	0.85 max	0.80	dB
3	Attenuation	500-2700	High	25 min	30	dB
4		10300-11900	High	8 min	10	dB
6	Attenuation	4800-4992	Low	25 min	28	dB
7		4900-5950	Low	25 min	27	dB
8		7200-7500	Low	25 min	30	dB
9	Isolation	500-2700	Low-High	25 min	30	dB
10		5150-5950	Low-High	22 min	25	dB
11	VSWR	2400-2500	Ant	2.0 max	1.5	-
12	VSWR	4900-5950	Ant	2.0 max	1.3	-
13	VSWR	2400-2500	Low	2.0 max	1.5	-
14	VSWR	4900-5950	High	2.0 max	1.3	-

Mechanical Characteristics @ 25ºC

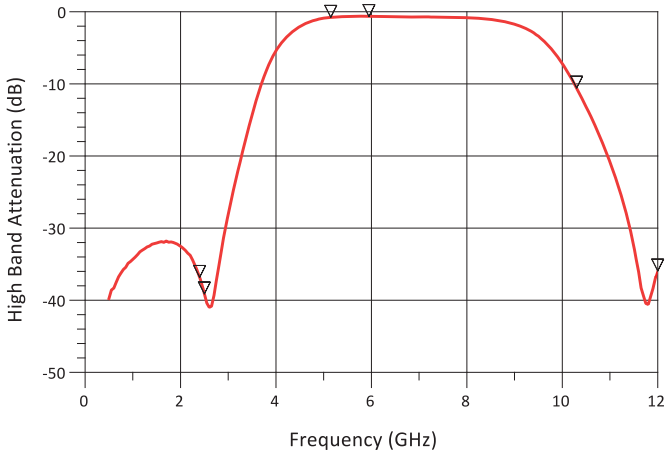
Size [mm(inches)]	1.65 x 0.88 (0.065 x 0.035)
Height [mm(inches)]	0.42 (0.017)
Volume (mm^3)	0.77

S PARAMETER MEASUREMENTS

LOW BAND PORT ATTENUATION



HIGH BAND ATTENUATION



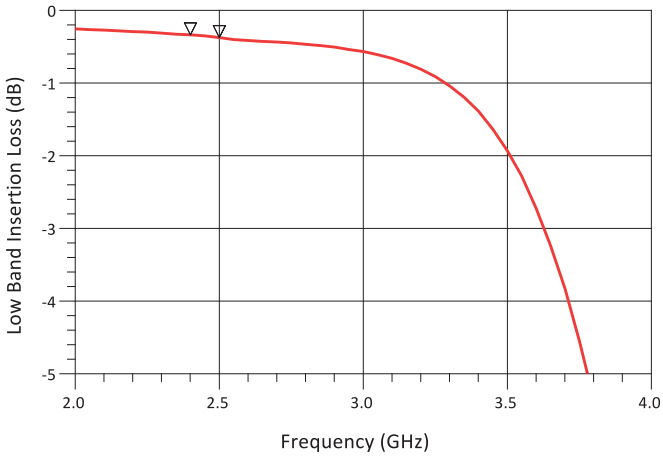
Low Band Attenuation

Frequency (GHz)	Attenuation (dB)
4.800	36.441
5.000	44.044
7.200	32.638
7.500	38.299
9.600	24.064
10.00	26.152

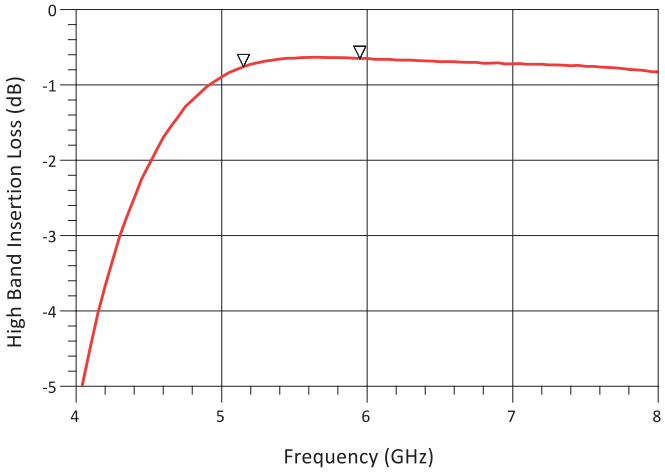
High Band Attenuation

Frequency (GHz)	Attenuation (dB)
2.400	36.829
2.500	39.116
10.30	10.573
12.00	35.929

LOW BAND INSERTION LOSS



HIGH BAND INSERTION LOSS



Low Band Insertion Loss

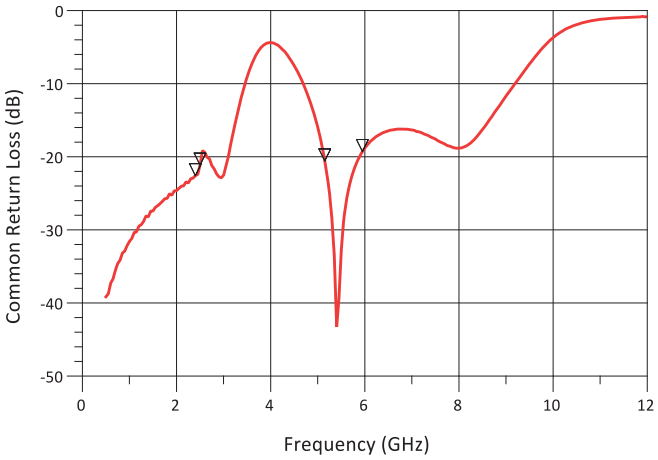
Frequency (GHz)	Insertion Loss (dB)
2.400	0.338
2.500	0.374

High Band Insertion Loss

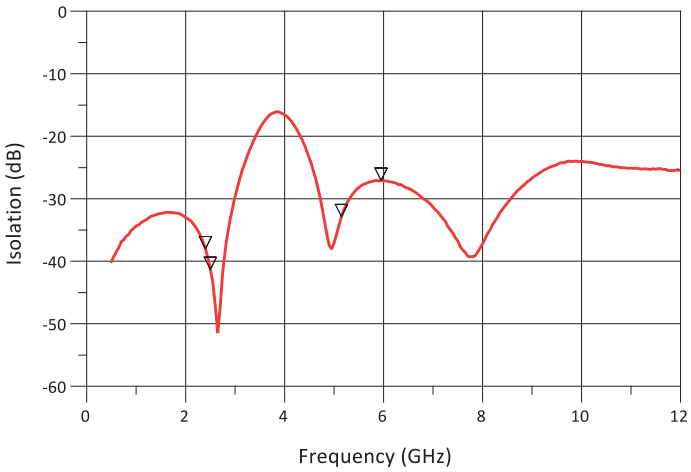
Frequency (GHz)	Insertion Loss (dB)
5.150	0.760
5.950	0.651

S PARAMETER MEASUREMENTS

COMMON PORT RETURN LOSS



ISOLATION



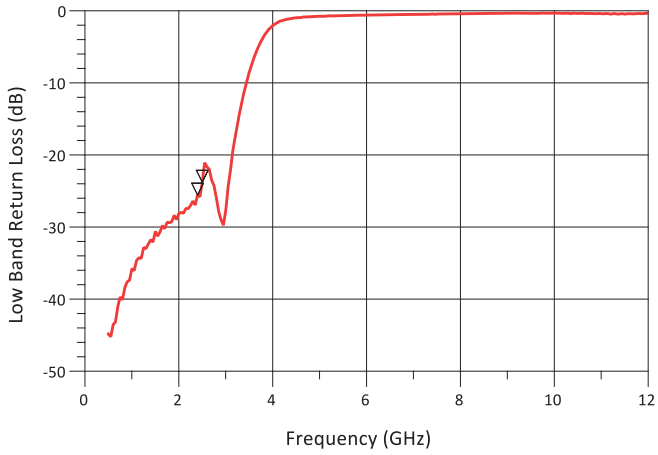
Common Return Loss

Frequency (GHz)	Return Loss (dB)	VSWR
2.400	22.592	1.160
2.500	21.127	1.193
5.150	20.578	1.206
5.950	19.279	1.244

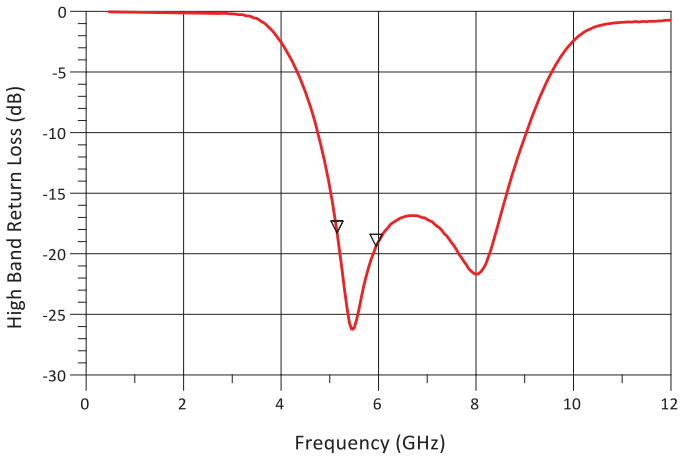
Isolation

Frequency (GHz)	Attenuation (dB)
2.400	38.031
2.500	41.305
5.150	32.861
5.950	27.052

LOW BAND RETURN LOSS



HIGH BAND RETURN LOSS



Low Band Return Loss

Frequency (GHz)	Return Loss (dB)	VSWR
2.400	25.568	1.111
2.500	23.775	1.138

High Band Return Loss

Frequency (GHz)	Return Loss (dB)	VSWR
5.150	18.278	1.278
5.950	19.376	1.241

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.

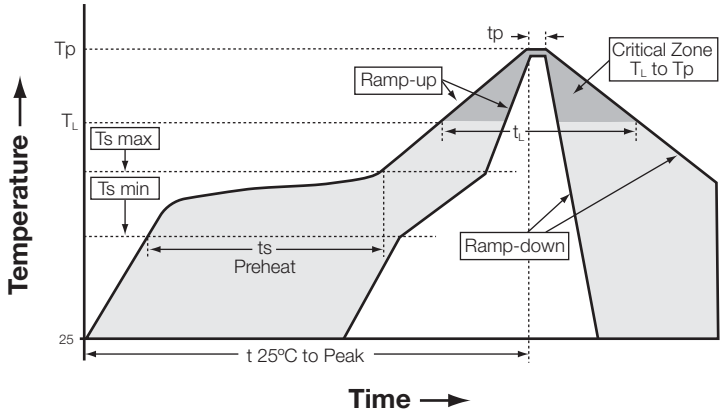


Figure A. Typical Lead Free Profile and Parameters

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.