

# APPROVAL SHEET

**AMDIP Series – 2012(0805)- RoHS Compliance**

**MULTILAYER CERAMIC DIPLEXER**

**Halogens Free Product**

**2.4 GHz & 5 GHz ISM Band RF Application**

**Automotive**

**Qualified to AEC-Q200**

**Preliminary**

**P/N: AMDIP2004L157B1U**

\*Contents in this sheet are subject to change without prior notice.

**FEATURES**

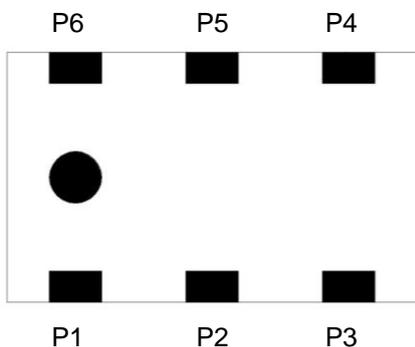
1. Miniature footprint: 2.0 X 1.25 X 0.4 mm<sup>3</sup>.
2. LTCC Process
3. Low Profile Thickness
4. Low Insertion Loss
5. High Rejection
6. RoHS Compliance
7. Halogens Free Product

**APPLICATIONS**

1. 2400 ~ 2500 MHz and 4900 ~ 5950 MHz working frequency

**CONSTRUCTION**

Top view



PIN	Connection	PIN	Connection
1	GND	4	Higher Freq. Port
2	Common(ANT) Port	5	GND
3	GND	6	Lower Freq. Port

**DIMENSIONS**

Figure	Symbol	Dimension (mm)
<p>The figure shows three views of the component with dimension lines:                       - <b>Top view:</b> Shows overall length L and width W.                       - <b>Bottom view:</b> Shows the thickness of the pads, labeled E.                       - <b>Side view:</b> Shows the total thickness T, and the thicknesses of the individual layers: A, B, C, and D.</p>	L	2.00 ± 0.15
	W	1.25 ± 0.15
	T	0.40 ± 0.10
	A	0.20 ± 0.15
	B	0.30 ± 0.15
	C	0.35 ± 0.15
	D	0.65 ± 0.15
	E	0.20 ± 0.15

**ELECTRICAL CHARACTERISTICS**

AMDIP2004L157B1U	Specification	
Frequency range	2400 ~ 2500 MHz	4900 ~ 5950 MHz
Insertion Loss	0.65 dB max. at +25°C 0.95 dB max. at -55°C ~ +125°C	1.2 dB max. at +25°C 1.5 dB max. at -55°C ~ +125°C
Attenuation	10 dB min. @ 3600 MHz 20 dB min. @ 4800 ~ 5000 MHz 20 dB min. @ 7200 ~ 7500 MHz	20 dB min. @ 824 ~ 915 MHz 20 dB min. @ 1800 ~ 2500 MHz 10 dB min. @ 3000 ~ 3900 MHz 20 dB min. @ 9800 ~ 11900 MHz 18 dB min. @ 14700 ~ 17850 MHz
Isolation	20 dB min. @ DC ~ 2500 MHz 20 dB min. @ 4900 ~ 5950 MHz	
VSWR	2.0 max.	
Impedance	50Ω	
Moisture sensitivity levels	LEVEL 1 (Refer to : IPC/JEDEC J-STD-020)	

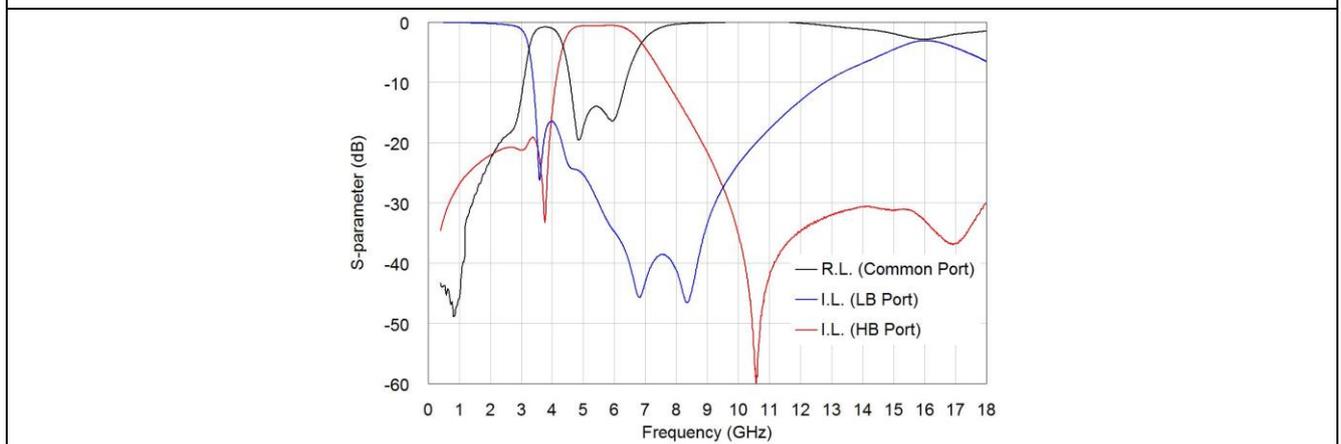
**Operating & Storage Condition (Component)**

Operation Temperature Range: -55°C ~ +125°C  
Storage Temperature Range: -55°C ~ +125°C

**Storage Condition before Soldering (Included packaging material)**

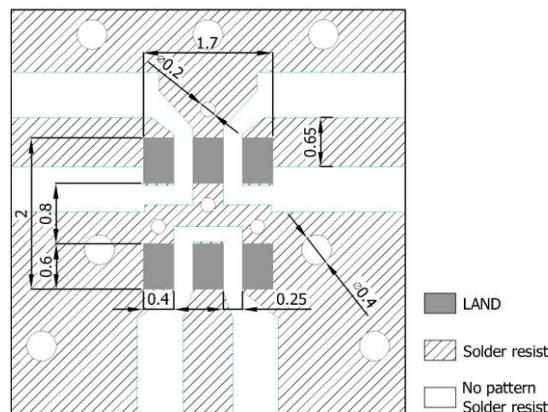
Storage Temperature Range: +5 ~ +40 °C  
Humidity: 30 to 70% relative humidity

Typical Electrical Chart



**SOLDER LAND PATTERN**

**Figure**



Unit: mm

Line width to be designed to match 50 Ω characteristic impedance, depending on PCB material and thickness.

## RELIABILITY TEST

TEST	PROCEDURE / TEST METHOD	REQUIREMENT
Resistance to soldering heat (R.S.H) <b>MIL-STD-202 method 210</b>	Un-mounted chips completely immersed for 10±1 second in a SAC solder bath at 270°C ±5°C	No mechanical damage. Electrical specification shall satisfy the descriptions in electrical characteristics under the operational temperature range within -55 ~ 125°C. Loss of metallization on the edges of each electrode shall not exceed 25
Solderability <b>J-STD-002</b>	a)4hrs / 155°C *dry then solder dipping 235°C/5sec b)Steam 8 hrs then 215°C / 5sec solder dipping c)Steam 8 hrs then 260°C / 7sec solder dipping	95% coverage min., good tinning and no visible damage
Temperature cycling <b>JESD22 method JA-104</b>	1000 cycles, -55°C ~ +125°C, dwell time 30min	No mechanical damage. Electrical specification shall satisfy the descriptions in electrical characteristics under the operational temperature range within -55 ~ 125°C.
Humidity MIL-STD-202 method 103	1000+48/-0 hours; 85°C, 85% RH	No mechanical damage. Electrical specification shall satisfy the descriptions in electrical characteristics under the operational temperature range within -55 ~ 125°C.
High Temperature Exposure <b>MIL-STD-202 method 108</b>	1000+48/-0 hours; without load in a temperature chamber controlled 125±3°C	No mechanical damage. Electrical specification shall satisfy the descriptions in electrical characteristics under the operational temperature range within -55 ~ 125°C.
Mechanical Shock <b>MIL-STD-202 method 213</b>	1/2 Sine Pulse / 100g Peak / Velocity 12.3ft/sec	No mechanical damage. Electrical specification shall satisfy the descriptions in electrical characteristics under the operational temperature range within -55 ~ 125°C.
Board Flex <b>AEC-Q200-005</b>	RF component mounted on a 90mm glass epoxy resin PCB(FR4), bending once 2mm for 60sec	No mechanical damage. Electrical specification shall satisfy the descriptions in electrical characteristics under the operational temperature range within -55 ~ 125°C.
Terminal strength <b>AEC-Q200-006</b>	Pressurizing force: 1.8Kg, Test time: 60±1sec. Only 0402 for 1.0kg/60sec	No remarkable damage or removal of the terminations
Vibration <b>MIL-STD-202 method 204</b>	Test 5g's for 20min., 12 cycles each of 3 orientations	No mechanical damage. Electrical specification shall satisfy the descriptions in electrical characteristics under the operational temperature range within -55 ~ 125°C.
ESD <b>AEC-Q200-002</b>	Test contact 1.0KV ( 0.5KV for 1005 only)	No mechanical damage. Electrical specification shall satisfy the descriptions in electrical characteristics under the operational temperature range within -55 ~ 125°C.

**SOLDERING CONDITION**

Typical examples of soldering processes that provide reliable joints without any damage are given in Fig 2,

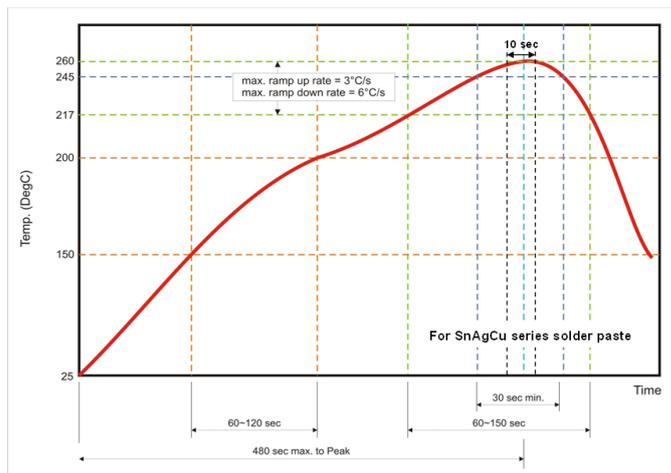


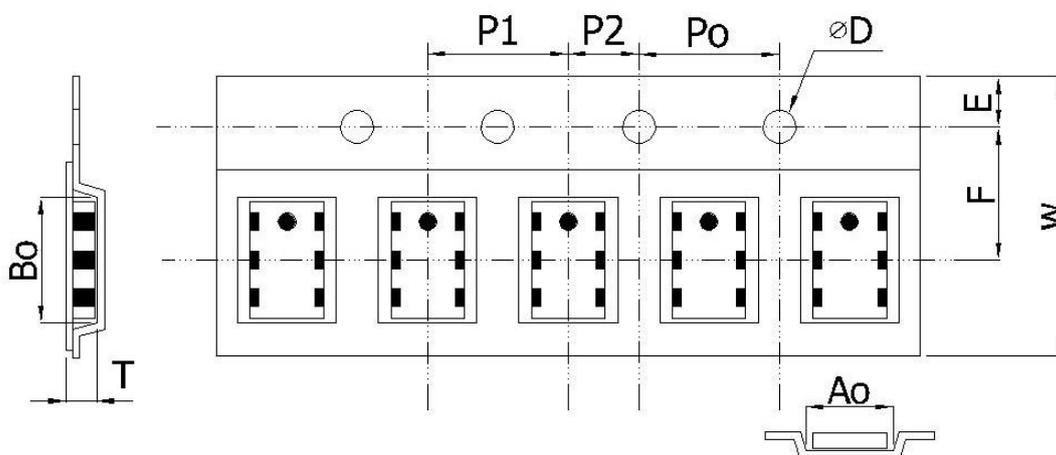
Fig 2. Infrared soldering profile

**ORDERING CODE**

<b>AM</b> Walsin Automotive device	<b>DIP</b> Product Code DIP : Diplexer	<b>20</b> Dimension code Per 2 digits of Length, Width,; e.g. : 20 = Length 20, Width 12,	<b>04</b> Dimension code 04= Thickness 04	<b>L</b> Application L : 2.4GHz/5GHz	<b>157B1U</b> Specification Design code
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Minimum Ordering Quantity: 2000 pcs per reel.

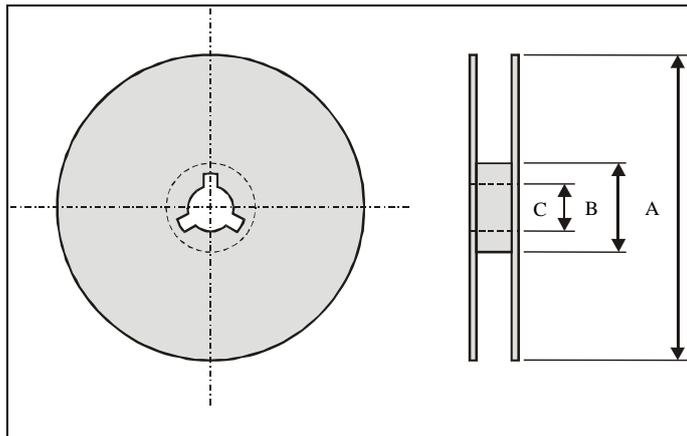
**PACKAGING**



**Plastic Tape specifications (unit :mm)**

Index	Ao	Bo	ΦD	T	W
Dimension (mm)	1.40 ± 0.10	2.25 ± 0.10	1.55 ± 0.05	0.75 ± 0.10	8.0 ± 0.10
Index	E	F	Po	P1	P2
Dimension (mm)	1.75 ± 0.10	3.50 ± 0.05	4.00 ± 0.10	4.00 ± 0.10	2.00 ± 0.05

**Reel dimensions**



Index	A	B	C
Dimension (mm)	Φ178.0	Φ60.0	Φ13.0

Taping Quantity:2000 pieces per 7" reel

**CAUTION OF HANDLING**

**Limitation of Applications**

Please contact us before using our products for the applications listed below which require especially high reliability for the prevention of defects, which might directly cause damage to the third party's life, body or property.

- (1) Aircraft equipment
- (2) Aerospace equipment
- (3) Undersea equipment
- (4) Medical equipment
- (5) Disaster prevention / crime prevention equipment
- (6) Traffic signal equipment
- (7) Transportation equipment (vehicles, trains, ships, etc.)
- (8) Applications of similar complexity and /or reliability requirements to the applications listed in the above.

**Storage condition**

- (1) Products should be used in 6 months from the day of WALSIN outgoing inspection.
- (2) Storage environment condition.
  - Products should be storage in the warehouse on the following conditions.
  - Temperature : +5 to +40°C
  - Humidity : 30 to 70% relative humidity
  - Don't keep products in corrosive gases such as sulfur. Chlorine gas or acid or it may cause oxidization of electrode, resulting in poor solderability.
  - Products should be storage on the palette for the prevention of the influence from humidity, dust and son on.
  - Products should be storage in the warehouse without heat shock, vibration, direct sunlight and so on.
  - Products should be storage under the airtight packaged condition.

# Mouser Electronics

Authorized Distributor

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[AMDIP2004L157B1U](#) [AMDIP250070L4T](#) [AMDIP2520070L3T](#) [AMDIP1607L164B8Q1C](#)