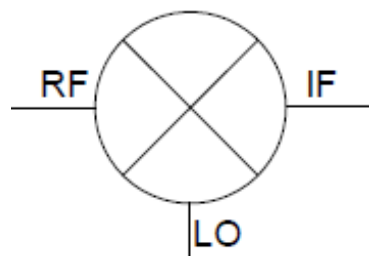


OVERVIEW:

ED2-0024 is a double-balanced passive 2.5 mm by 2.5 mm glass package mixer technology. The ED2-0024 mixer can be used as an upconverter or downconverter for LO and RF frequencies from 20 GHz to 65 GHz, and covers IF bandwidths from DC to 20GHz. The mixer provides excellent LO to RF and LO to IF isolation, and is ideal for use in wideband millimeter wave systems for communications, defense, and test and measurement applications. All technical data based on Mini-Circuits Die MDB-653H-D+



APPLICATIONS:

- Test & Measurement
- 5G mmWave and Back Haul Radio
- Satellite Communications
- Radar, EW and ECM Defense Systems

FEATURES:

- Wideband RF and LO, 20 to 65 GHz
- Wideband IF, DC to 20 GHz
- High L-R isolation, 40 dB typical at 40 GHz, and High input IP3, +23 dBm typical.
- Useable as Up and Down converter
- High image rejection, 25 dB
- High LO-RF isolation, 45 to 50 dB
- High LO-IF isolation, 30 dB
- Wide bandwidth, 18 to 65 GHz
- Wide IF Bandwidth, DC to 20GHz
- SMT package works up to 90GHz
- Double balanced
- Usable in first and second down converter applications. IF as low as DC enables. Use in phase detectors applications
- Useful in Wide Band Systems
- Operating temperature -40°C to 85°C
- 2.5 x 2.5 x .264 mm, SMT BGA glass package

ASSEMBLY DIAGRAM:



Electrical Specifications¹ at 25°C, Z_o = 50Ω

Parameter	Condition (GHz)	Min.	Typ.	Max.	Units
RF Frequency Range		20		65	GHz
LO Frequency Range		20		65	GHz
IF Frequency Range		DC		20	GHz
LO Power		14	15	16	dBm
Conversion Loss at (IF= 2 GHz)	20		9.6		dB
	30		9.9		
	40		11.3		
	50		10.3		
	60		11.8		
	65		13.8		
LO-RF Isolation	20		38		dB
	30		41		
	40		38		
	50		54		
	60		44		
	65		38		
LO-IF Isolation	20		34		dB
	30		48		
	40		39		
	50		24		
	60		32		
	65		30		
RF-IF Isolation	20		32		dB
	30		30		
	40		24		
	50		20		
	60		29		
	65		34		
Pin at 1dB Compression	20-60		10		dBm
Input IP3	20-60		20		dBm

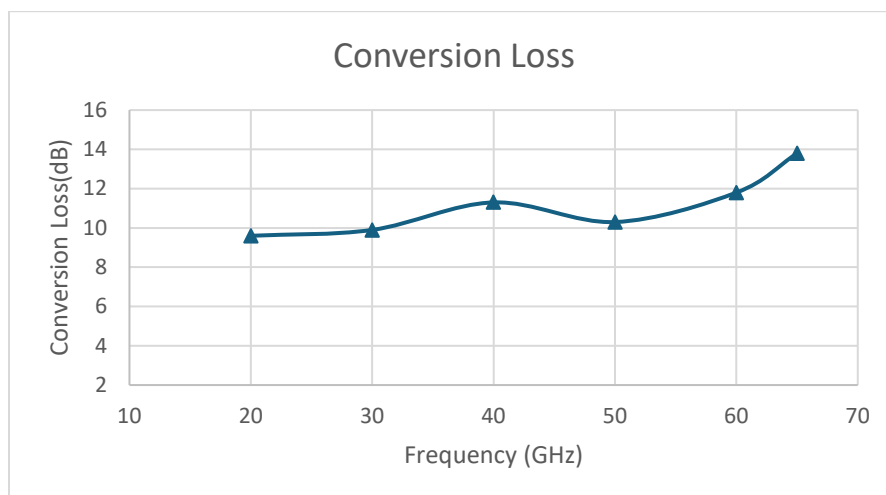
¹ Package loss expected added

Absolute Maximum Ratings

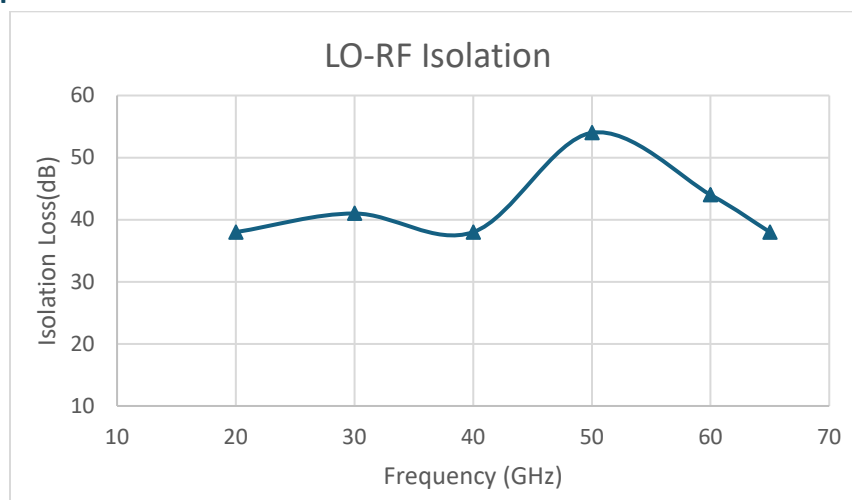
Parameter	Condition (GHz)
Operating temperature	-40 °C to 85°C
RF Power	22 dBm
LO Power	22 dBm
IF Current	30 mA

Performance Charts

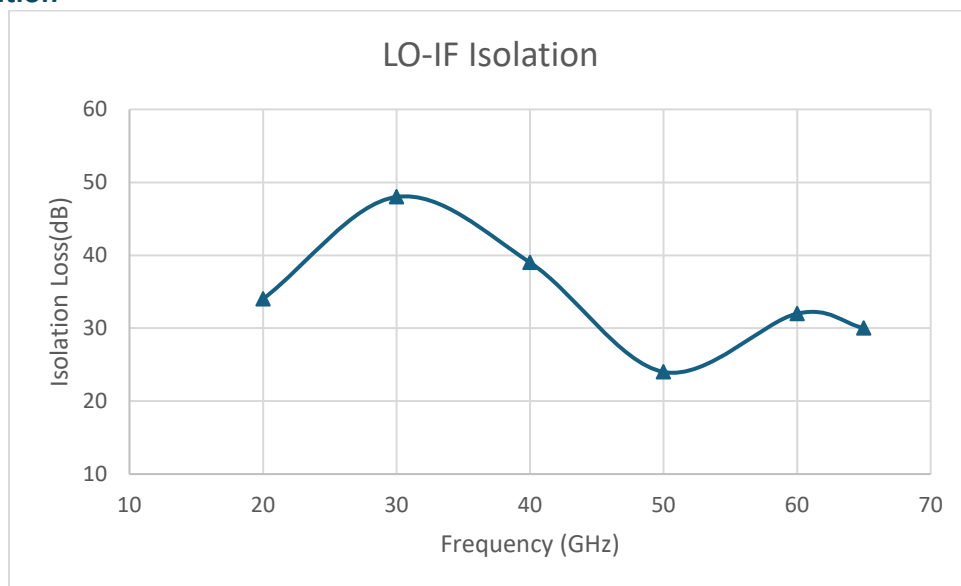
Conversion Loss



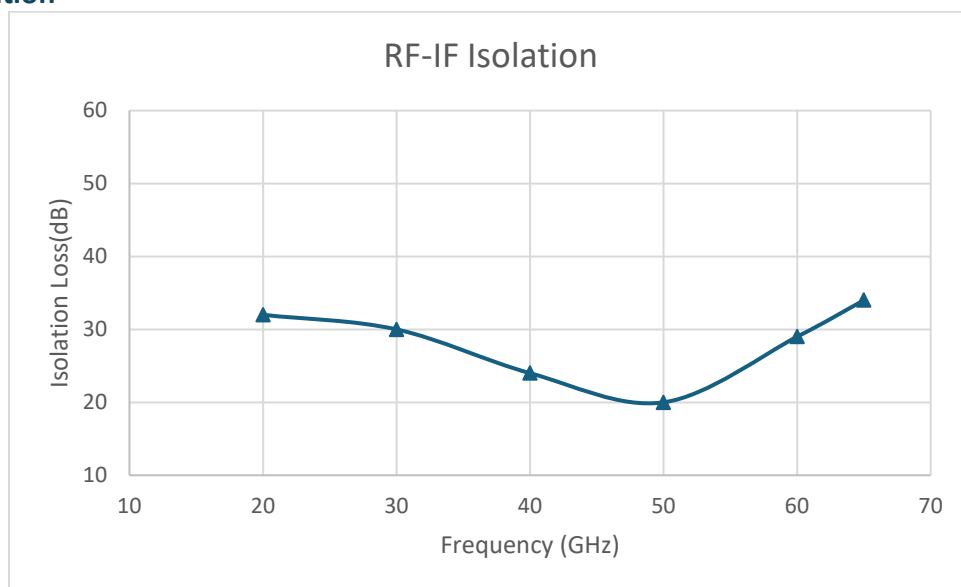
LO-IF Isolation

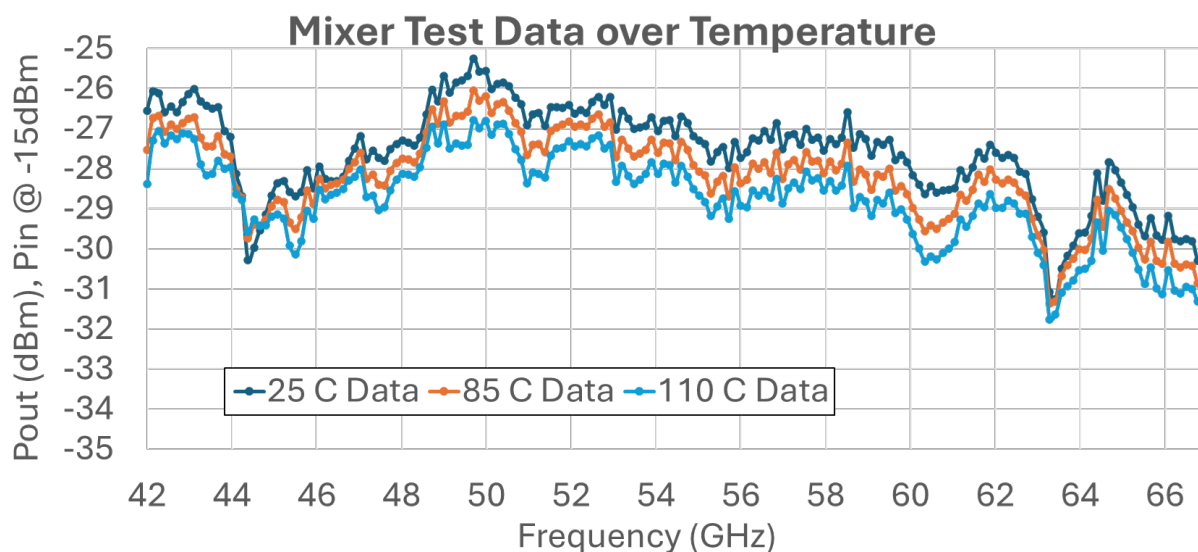


LO-IF Isolation

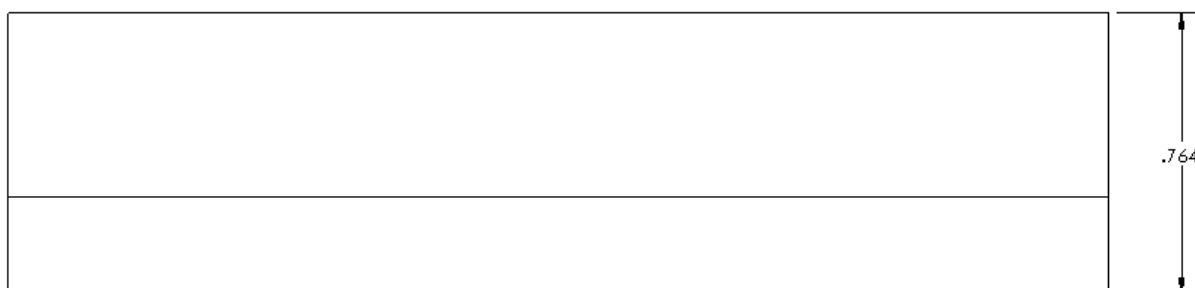
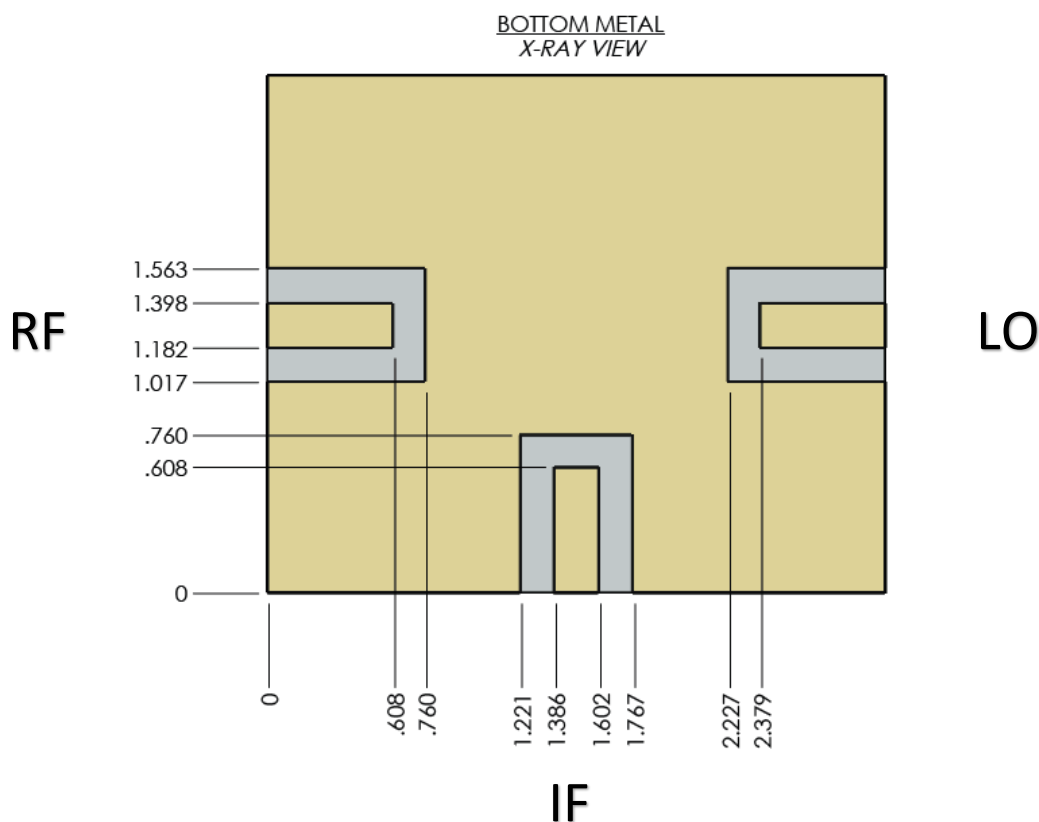


RF-IF Isolation



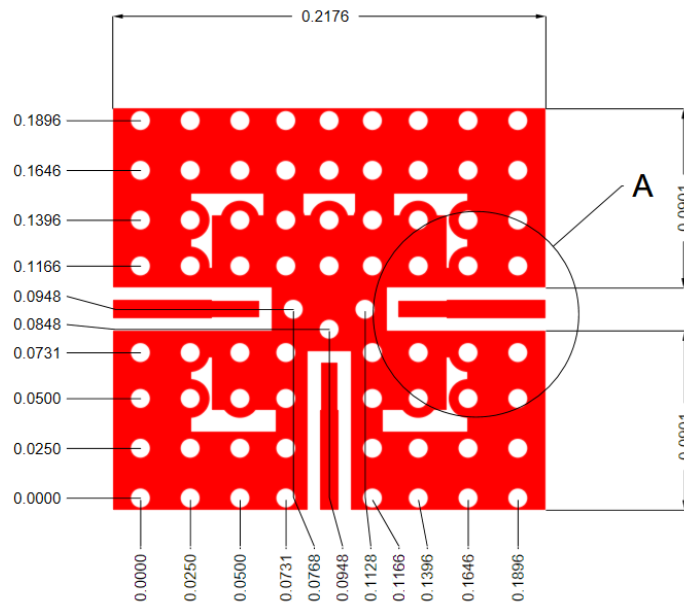


Outline Drawing and Dimensions



Recommended Footprint

Layer 1 Detail



NOTES:
1. ALL HOLES SHOWN ARE 0.010"
2. UNITS ARE IN INCHES

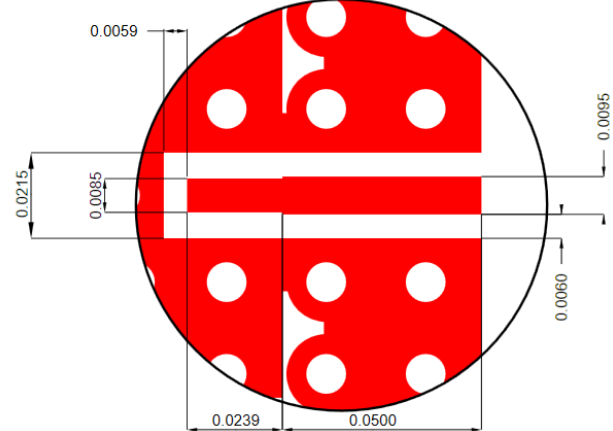
RF layers consist of 3 layers of Isola Astra MT-77 dielectric with circuitry on layer 1 and ground planes on layers 2 and 3. $Dk=3.0$ $Df=0.0017$.

Layer 1 to 2 shall be 5 mils of Isola Astra MT-77 core with VLP-2 copper.

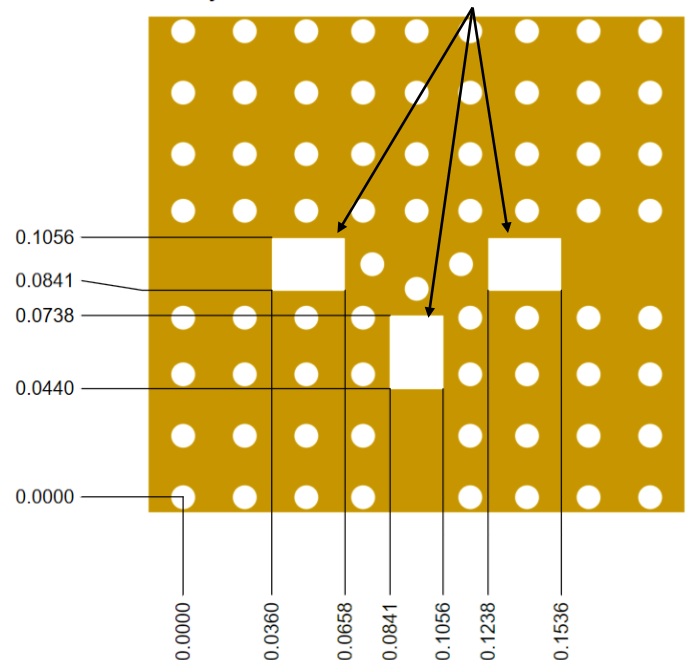
Layers 2 to 3 shall be 5 mils of Isola Astra MT-77 dielectric.

Layer 3 shall be a solid ground plane under cutouts.

DETAIL A (Scale 32:1)



Layer 2 Ground Plane Cutouts



NOTES:
1. ALL HOLES SHOWN ARE 0.010"
2. UNITS ARE IN INCHES

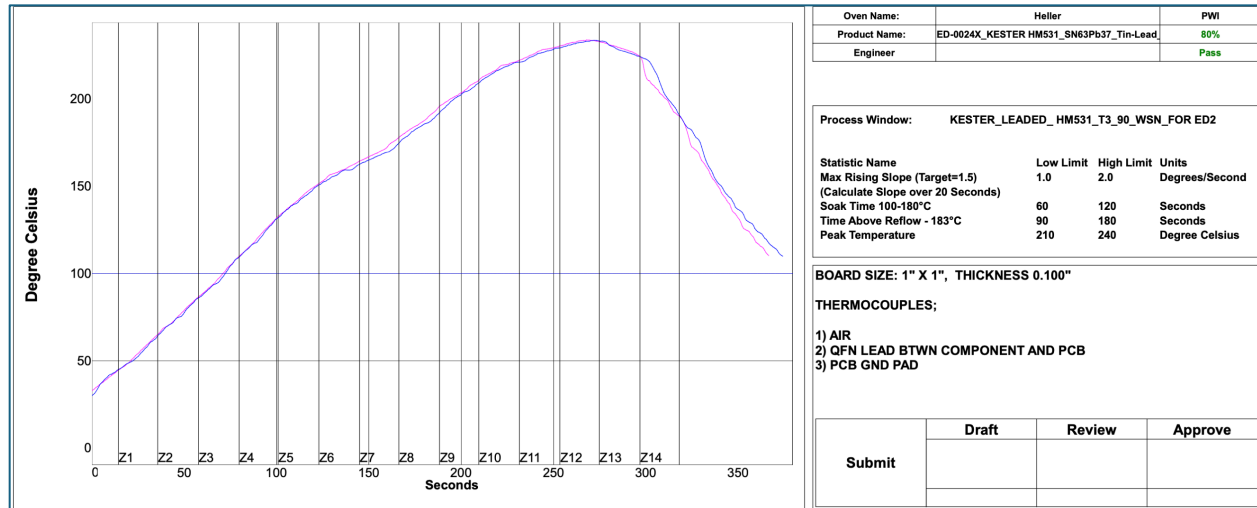
Super Wideband Double-Balanced Glass Mixer



Data Sheet

ED2-0024

Reflow Profile



TC	Position	Max Rising Slope		Soak Time 100-180°C		Reflow Time /183°C		Peak Temperature	
		Slope	PWI	Time	PWI	Time	PWI	Temp	PWI
1	QNF LEAD	1.10	-80%	97.65	25%	148.85	31%	233.84	59%
2	PCB GND PAD	1.15	-71%	99.96	33%	147.79	28%	233.67	58%
Delta		0.05		2.31		1.06		0.17	

Thu Sep 12 2024 09:18:26		
Oven Name:	Heller	PWI
Product Name:	ED-0024X_KESTER HM531_SN63Pb37_Tin-Lead	80%
Engineer		Pass
Process Window: KESTER_LEADED_HM531_T3_90_WSN_FOR ED2		
Statistic Name	Low Limit	High Limit Units
Max Rising Slope (Target=1.5) (Calculate Slope over 20 Seconds)	1.0	2.0 Degrees/Second
Soak Time 100-180°C	60	120 Seconds
Time Above Reflow - 183°C	90	180 Seconds
Peak Temperature	210	240 Degree Celsius
BOARD SIZE: 1" X 1", THICKNESS 0.100"		
THERMOCOUPLES;		
1) AIR		
2) QFN LEAD BTWN COMPONENT AND PCB		
3) PCB GND PAD		



Data Sheet

ED2-0024

Ordering Guide		
Model	Temperature Range	Package Description
ED2-0024	-40°C to 85°C	BGA
ED2-0024-000203	-40°C to 85°C	Eval Board (ED2-0024 incl.)