

Design Evaluation Boards (DEBs)

DLI RF/Microwave Products

RF Filters, Couplers and Power Dividers

DESCRIPTION

Design Evaluation Boards (DEBs) provide a convenient, fully connectorized evaluation platform for assessing the assembled performance of Knowles RF filters, power dividers and couplers. Each DEB features a device mounted on a 10 mil Rogers RO4350B circuit board with an aluminum base plate and coaxial connectors at the RF I/O ports.

The filters, couplers, and power dividers featured in this datasheet leverage DLI's high dielectric constant ceramic materials to achieve a compact form factor with stable frequency response over temperature. Available across a broad range of frequency bands, these devices offer versatile, reliable performance for RF and microwave applications.

FEATURES

- Fully assembled and connectorized
- 50 Ω Matched RF Inputs/Outputs
- Thru Line included (select models)
- Operating Temp: -55°C to +150°C

APPLICATIONS

- Laboratory Evaluation
- Test and Measurement
- Breadboarding
- System Prototyping



DEBs Overview

Design Evaluation Boards (DEBs) are available for all RF component types, including filters (band-pass, low-pass, high-pass), couplers and power dividers. These boards are designed to enable rapid evaluation and characterization of component performance.

Standard DEB Features include:

- Fabricated on 10mil Rogers RO4350B laminate with aluminum baseplate
- Compact board sizes (excluding connectors): 1×1 in (25.4×25.4 mm), 2×1 in (50.8×25.4 mm) or 2x2 in (50.8×50.8 mm)
- Equipped with edge-launch coaxial connectors (SMA, 2.92mm or 2.4mm female) on all ports:
 - SMA: MPN 142-0761-851 or similar
 - 2.92mm: MPN 1092-01A-6 or similar
 - 2.4mm: MPN 1492-04A-5 or similar
- Thru-line included on select filter boards
 - When a thru-line is not included, the connectors are center-aligned
- Filter covers are installed utilizing high melting-temperature, Pb-based solder. Parts are soldered to the DEB boards using SN63 low melting temperature solder.
- Full product datasheets and additional technical resources are available at: <https://www.knowlescapacitors.com/Products/Microwave-Products>. You can also access datasheets directly by clicking the individual component part numbers within this document.

The component data as presented on the datasheet is either measured directly at the device ports using probes or through de-embedded measurements. When the component is mounted on a DEB board, the insertion loss increases due to additional loss contributions from connectors and board traces. Figure 1 shows the S11 and S21 response of a thru-line, which can be used to estimate the DEB performance.

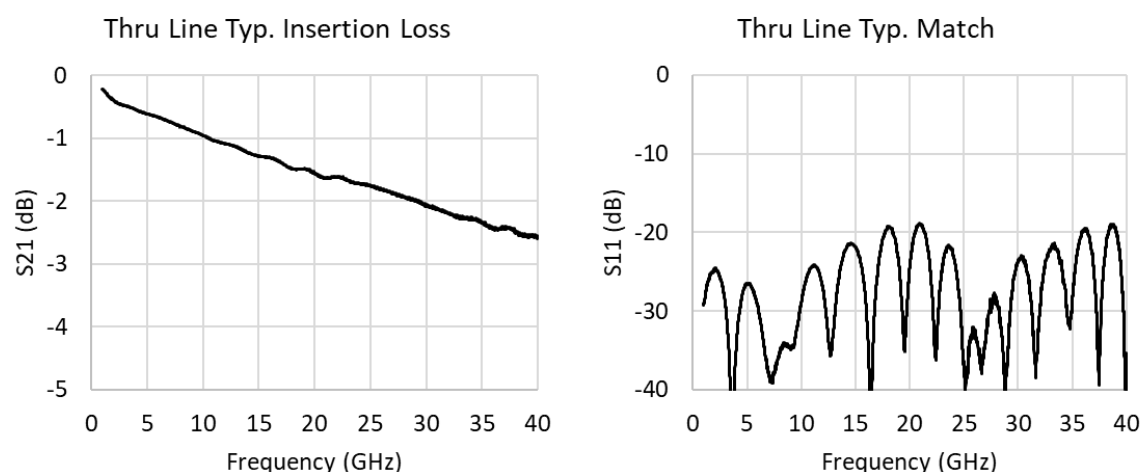


Figure 1 – Typical measured loss and match of a Thru Line on 1in DEB with 2.92mm connectors

Filter DEBs

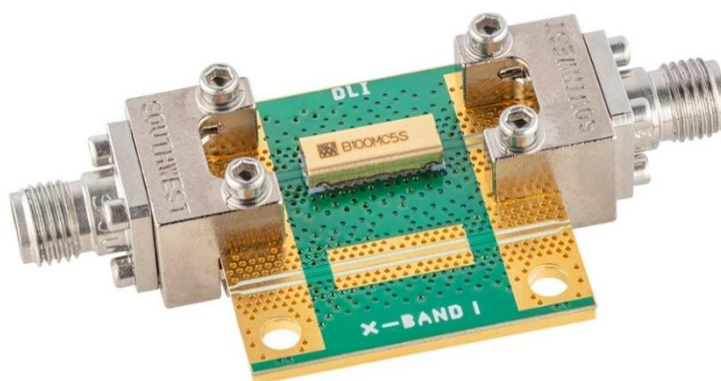


Figure 2 – Example of 1x1 Filter DEB with Thruline

Table 1 – List of select Filter DEBs. All filter DEBs are 1x1in (excl. connectors).

Component PN	DEB PN	Description	Frequency (GHz)	Connector	Thruline
B024RF2S	DEB-B024RF2S	Bandpass Filter	1.97 - 3.05	2.92mm	Yes
B047MC5S	DEB-B047MC5S	Bandpass Filter	4.4 - 5	2.92mm	Yes
B055NC5S	DEB-B055NC5S	Bandpass Filter	5 - 6	2.92mm	Yes
B056RC4S	DEB-B056RC4S	Bandpass Filter	4 - 8	SMA	No
B065NC5S	DEB-B065NC5S	Bandpass Filter	6 - 7	2.92mm	Yes
B070MB6S	DEB-B070MB6S	Bandpass Filter	6.7 - 7.25	SMA	No
B070NC5S	DEB-B070NC5S	Bandpass Filter	6.45 - 7.55	SMA	No
B080MB5S	DEB-B080MB5S	Bandpass Filter	7.5 - 8.5	SMA	No
B081RC0S	DEB-B081RC0S	Bandpass Filter	6 - 11	2.92mm	Yes
B083LB6S	DEB-B083LB6S	Bandpass Filter	8 - 8.5	2.92mm	Yes
B089NC4S	DEB-B089NC4S	Bandpass Filter	8.1 - 10.1	2.92mm	Yes
B094LA2S	DEB-B094LA2S	Bandpass Filter	9.25 - 9.6	2.92mm	Yes
B095MB1S	DEB-B095MB1S	Bandpass Filter	8.9 - 10	2.92mm	Yes
B096QC2S	DEB-B096QC2S	Bandpass Filter	8 - 10	SMA	No
B099NC4S	DEB-B099NC4S	Bandpass Filter	9 - 11	2.92mm	Yes
B100MC5S	DEB-B100MC5S	Bandpass Filter	9.5 - 10.5	2.92mm	Yes
B116NC5S	DEB-B116NC5S	Bandpass Filter	10.25 - 12.5	2.92mm	Yes
B120MB1S	DEB-B120MB1S	Bandpass Filter	11.5 - 12.5	2.92mm	No
B127MB2S	DEB-B127MB2S	Bandpass Filter	12.25 - 13.25	2.92mm	Yes
B144MB1S	DEB-B144MB1S	Bandpass Filter	14 - 15	2.92mm	Yes
B148QF0S	DEB-B148QF0S	Bandpass Filter	12 - 18	SMA	No
B149MC1S	DEB-B149MC1S	Bandpass Filter	14 - 16	2.92mm	Yes
B150OG0S	DEB-B150OG0S	Bandpass Filter	13 - 16	2.92mm	Yes
B165LA1S	DEB-B165LA1S	Bandpass Filter	16 - 17	2.92mm	Yes
B168MB1S	DEB-B168MB1S	Bandpass Filter	15.75 - 17.75	2.92mm	Yes

Component PN	DEB PN	Description	Frequency (GHz)	Connector	Thruline
B192NB2S	DEB-B192NB2S	Bandpass Filter	17.2 - 21.2	2.92mm	No
B259MC1S	DEB-B259MC1S	Bandpass Filter	24.25 - 27.5	2.92mm	Yes
B274MB1S	DEB-B274MB1S	Bandpass Filter	26.5 - 29.5	2.92mm	No
B385MD0S	DEB-B385MD0S	Bandpass Filter	37 - 40	2.4mm	Yes
H160XHXS	DEB-H160XHXS	Highpass Filter	16.5 - 32.5	2.92mm	No
H182XHXS	DEB-H182XHXS	Highpass Filter	18.75 - 28	2.92mm	No
L050XF9S	DEB-L050XF9S	Lowpass Filter	DC - 4.8	SMA	No
L065XG9S	DEB-L065XG9S	Lowpass Filter	DC - 6	SMA	No
L095XG9S	DEB-L095XG9S	Lowpass Filter	DC - 9	2.92mm	No
L128XH4S	DEB-L128XH4S	Lowpass Filter	DC - 12	2.92mm	No
L157XG3S	DEB-L157XG3S	Lowpass Filter	DC - 15.5	2.92mm	No
L185XF4S	DEB-L185XF4S	Lowpass Filter	DC - 18	2.92mm	No
L204XF4S	DEB-L204XF4S	Lowpass Filter	DC - 20	2.92mm	No
L254XF3S	DEB-L254XF3S	Lowpass Filter	DC - 25	SMA	No
L288XC3S	DEB-L288XC3S	Lowpass Filter	DC - 27	2.92mm	No

Coupler DEBs

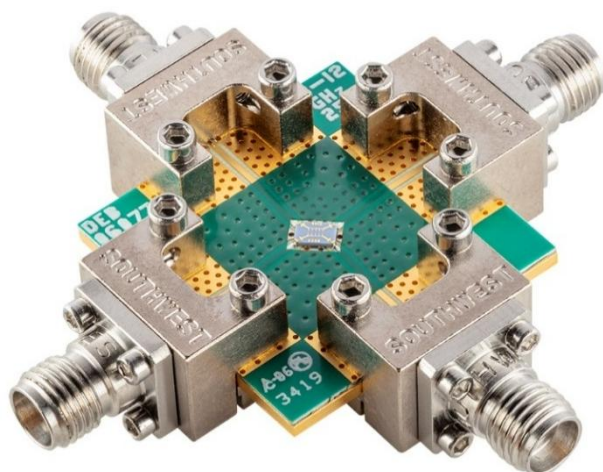


Figure 3 – Example of 1x1 in Coupler DEB

Table 2 – List of select Coupler DEBs

Component PN	DEB PN	Description	Frequency (GHz)	DEB Dimensions (in)	Connector
FPC07234	DEB07234	10dB Directional Coupler	2-18	2x1	2.92mm
FPC09291	DEB09291	10dB Directional Coupler	2-18	2x2	2.92mm
FPC06073	DEB06073	10dB Directional Coupler	4-8	1x1	2.92mm
FPC06149	DEB06149	10dB Directional Coupler	4-8	1x1	SMA
FPC06719	DEB06719	10dB Directional Coupler	6-18	1x1	2.92mm
FPC06074	DEB06074	10dB Directional Coupler	8-12	1x1	2.92mm
FPC06150	DEB06150	10dB Directional Coupler	8-12	1x1	2.92mm
FPC06075	DEB06075	10dB Directional Coupler	12-18	1x1	2.92mm
FPC06151	DEB06151	10dB Directional Coupler	12-18	1x1	2.92mm
FPC07182	DEB07182	10dB Directional Coupler	20-40	1x1	2.92mm
FPC08057	DEB08057	10dB Directional Coupler	20-40	1x1	2.92mm
FPC07180	DEB07180	20dB Directional Coupler	2-18	2x1	2.92mm
FPC07237	DEB07237	20dB Directional Coupler	2-18	2x2	2.92mm
FPC06076	DEB06076	20dB Directional Coupler	4-8	1x1	SMA
FPC06152	DEB06152	20dB Directional Coupler	4-8	1x1	SMA
FPC06913	DEB06913	20dB Directional Coupler	6-18	1x1	2.92mm
FPC06153	DEB06153	20dB Directional Coupler	8-12	1x1	2.92mm
FPC06302	DEB06302	20dB Directional Coupler	8-12	1x1	2.92mm
FPC06078	DEB06078	20dB Directional Coupler	12-18	1x1	2.92mm
FPC06154	DEB06154	20dB Directional Coupler	12-18	1x1	2.92mm
FPC07181	DEB07181	20dB Directional Coupler	20-40	1x1	2.92mm
FPC08056	DEB08056	20dB Directional Coupler	20-40	1x1	2.92mm

Component PN	DEB PN	Description	Frequency (GHz)	DEB Dimensions (in)	Connector
FPC08035	DEB08035	20dB Term. Directional Coupler	20-40	1x1	2.92mm
FPC06077	DEB06077	25dB Directional Coupler	8-12	1x1	2.92mm
FPC06700	DEB06700	3dB 90° Hybrid Coupler	5.9-6.5	1x1	SMA
FPC10207	DEB10207	3dB 90° Hybrid Coupler	8-12	1x1	2.92mm
FPC06630	DEB06630	3dB 90° Hybrid Coupler	9-11	1x1	2.92mm
FPC06701	DEB06701	3dB 90° Hybrid Coupler	10.7-12.75	1x1	2.92mm
FPC07183	DEB07183	3dB 90° Hybrid Coupler	24-33	1x1	2.92mm
FHC09096	DEB09096	3dB 90° Hybrid Coupler, SMD	4-8	1x1	2.92mm
FHC10292	DEB10292	3dB 90° Hybrid Coupler, SMD	6-18	1x1	2.92mm
FHC09101	DEB09101	3dB 90° Hybrid Coupler, WB	4-8	1x1	2.92mm
FHC10293	DEB10293	3dB 90° Hybrid Coupler, WB	6-18	1x1	2.92mm
FPC07803	DEB07803	20 dB Resistive Coupler	DC-40	1x1	2.4mm
FPC06881	DEB06881	20dB Resistive Coupler	DC-40	1x1	2.92mm
FPC06882	DEB06882	30dB Resistive Coupler	DC-25	1x1	2.92mm
FPC07802	DEB07802	30dB Resistive Coupler	DC-40	1x1	2.4mm

Power Divider (PDW) DEBs



Figure 4 – Example of 1x1in (left) and 2x1in (right) Power Divider DEBs

Table 3 – List of select Power Divider DEBs

Component PN	DEB PN	Description	Frequency (GHz)	DEB Dimensions (in)	Connector
PDR06390	DEB06390	2-way Resistive Divider, FC	DC-20	1x1	2.92mm
PDR05848	DEB05848	2-way Resistive Divider, FC	DC-40	0.31x0.36 (triangle)	Probe
PDR06380	DEB06380	2-way Resistive Divider, FC	DC-40	0.31x0.36 (triangle)	Probe
PDW06038	DEB06038	2-way Wilkinson Power Divider	2-10	1x1	SMA
PDW06407	DEB06407	2-way Wilkinson Power Divider	2-18	2x1	2.92mm
PDW06398	DEB06398	2-way Wilkinson Power Divider	5-7	1x1	2.92mm
PDW08606	DEB08606	2-way Wilkinson Power Divider	5.3-5.9	1x1	2.92mm
PDW05758	DEB05758	2-way Wilkinson Power Divider	6-18	1x1	2.92mm
PDW06011	DEB06011	2-way Wilkinson Power Divider	6-18	1x1	2.92mm
PDW09692	DEB09692	2-way Wilkinson Power Divider	8-50	1x1	2.4mm
PDW06399	DEB06399	2-way Wilkinson Power Divider	9-11	1x1	2.92mm
PDW08604	DEB08604	2-way Wilkinson Power Divider	10.6-11.8	1x1	2.92mm
PDW06400	DEB06400	2-way Wilkinson Power Divider	11-13	1x1	2.92mm
PDW06401	DEB06401	2-way Wilkinson Power Divider	15-17	1x1	2.92mm
PDW07691	DEB07691	2-way Wilkinson Power Divider	18-20	1x1	2.92mm
PDW07630	DEB07630	2-way Wilkinson Power Divider	24-32	1x1	2.92mm
PDW06984	DEB06984	2-way Wilkinson Power Divider	25-32	1x1	2.92mm
PDW08323	DEB08323	2-way Wilkinson Power Divider	37-42	1x1	2.92mm
PDW08607	DEB08607	4-way Wilkinson Power Divider	5.3-5.9	2x1	2.92mm
PDW06089	DEB06089	4-way Wilkinson Power Divider	6-18	2x1	2.92mm
PDW08605	DEB08605	4-way Wilkinson Power Divider	10.6-11.8	2x1	2.92mm
PDW07069	DEB07069	4-way Wilkinson Power Divider	24-32	2x1	2.92mm
PDW08324	DEB08324	4-way Wilkinson Power Divider	37-42	2x1	2.92mm
PDW11598	DEB11598	6-way Wilkinson Power Divider	6-18	2x2	2.92mm
PDW11596	DEB11596	6-way Wilkinson Power Divider	8-12	2x2	2.92mm

REVISION HISTORY

Revision	Date	Description
1.00	6/1/2026	Initial release

DISCLAIMER

Information in this document is for informational purposes only. All information regarding the product described in this datasheet is subject to change from time to time at Knowles' sole discretion. It is the customer's sole responsibility to evaluate the suitability of the product in the customer's particular application. Knowles assumes no responsibility or liability for the use of the information contained within.