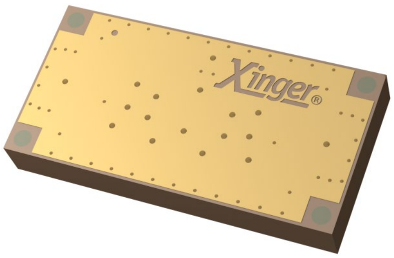
XMC0660B1-03G
Preliminary_Rev 5

TTM Technologies
Time-To-Market Interconnect Solutions

Xinger®

Hybrid Coupler
3 dB, 90°



Description:

The XMC0660B1-03G is a low profile, high performance 3dB hybrid coupler, with a power rating of 30 Watts (AVG) in a new easy to use, Xinger style manufacturing friendly surface mount package. It is designed particularly for ultra-broadband use on software definable radios and Broadband ADC in COTS Mil-Aero Radar & L, S and C-Band applications in select end markets. The XMC0660B1-03G is designed particularly for power splitting and combining, where tightly controlled coupling and low insertion loss is required.

Parts have been subjected to rigorous Xinger qualification testing and they are manufactured using materials with coefficients of thermal expansion (CTE) compatible with common substrates such as FR4, G-10, RF-35, RO4350 and polyimide. Available in 6 of 6 ENIG (XMC0660B1-03G) RoHS compliant finish.

Features:

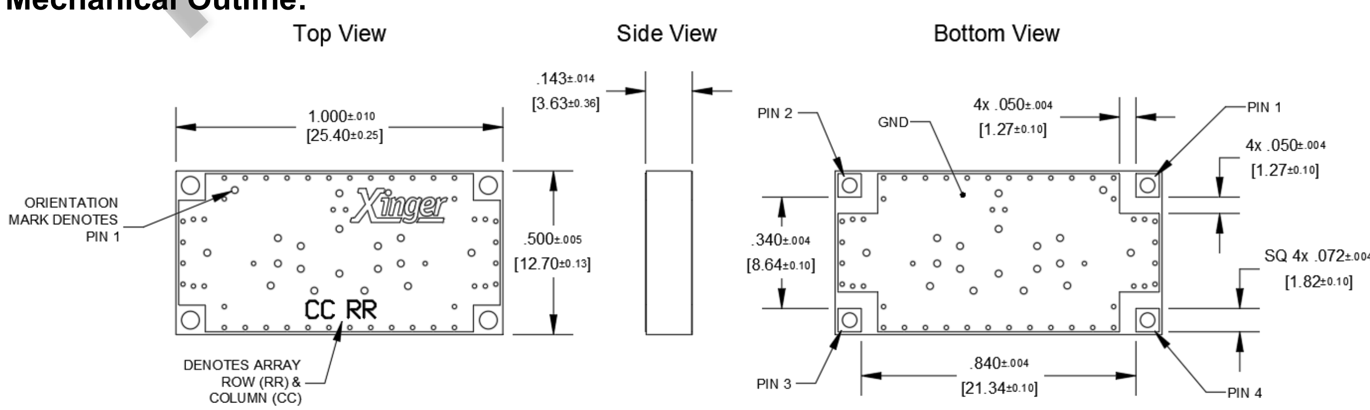
- **600-6000 MHz**
- **L, S & C-Band Radar COTS Mil-Aero**
- **Power 30W (AVG)**
- **Very Low Loss (0.2dB)**
- **Tight Amplitude Balance (1.5dB)**
- **High Isolation (15dB)**
- **Production Friendly**
- **Tape and Reel**
- **ENIG Finish**

Electrical Specifications:

Frequency	**Isolation**	**Insertion Loss**	**VSWR**
MHz	*dB Min*	*dB Max*	*Max : 1*
600-6000	15	1.5	1.5
Amplitude Balance	**Phase Balance**	**Power**	**Operating Temp.**
dB	*Degree*	*Avg. Watts @85°C*	*°C*
± 1.5	90 ± 5	30	-55 to +150

*Power Handling for commercial, non-life critical applications. See derating chart for other applications. Specification based on performance of unit properly installed on a TTM test board with small signal applied. Specifications subject to change without notice. Refer to parameter definitions for details.

Mechanical Outline:

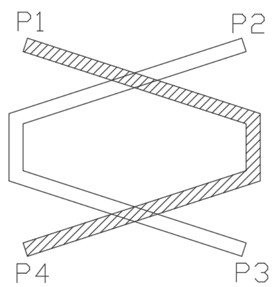


Dimensions are in Inches [Millimeters]

Tolerances are Non-Cumulative

Hybrid Coupler Pin Configuration:

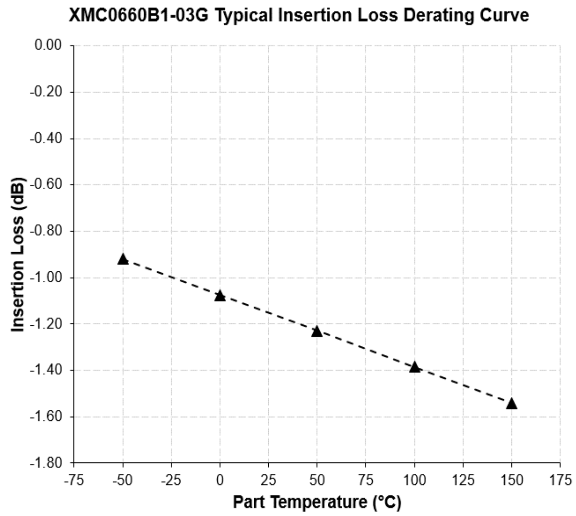
The XMC0660B1-03G has an orientation marker to denote Pin 1. Once port one has been identified the other ports are known automatically. Please see the chart below for clarification:

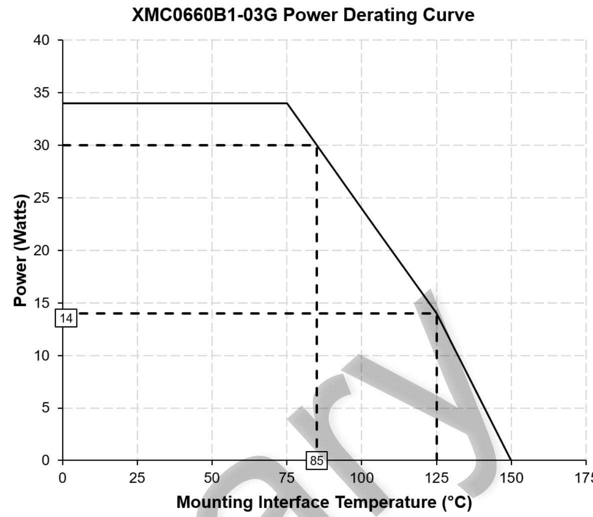


Configuration	Pin 1	Pin 2	Pin 3	Pin 4
Splitter	Input	Isolated	-3dB $\angle\theta$	-3dB $\angle\theta$-90
Splitter	Isolated	Input	-3dB $\angle\theta$-90	-3dB $\angle\theta$
Splitter	-3dB $\angle\theta - 90$	-3dB $\angle\theta$	Isolated	Input
Splitter	-3dB $\angle\theta$	-3dB $\angle\theta - 90$	Input	Isolated
***Combiner**	A $\angle\theta - 90$	A $\angle\theta$	Output	Isolated
***Combiner**	A $\angle\theta$	A $\angle\theta - 90$	Isolated	Output
***Combiner**	Isolated	Output	A $\angle\theta$	A $\angle\theta$-90
***Combiner**	Output	Isolated	A $\angle\theta$-90	A $\angle\theta$

*Note: “A” is the amplitude of the applied signals. When two quadrature signals with equal amplitudes are applied to the coupler as described in the table, they will combine at the output port. If the amplitudes are not equal, some of the applied energy will be directed to the isolated port.

Power Derating Curves:





Insertion Loss Derating:

The insertion loss, at a given frequency, of the coupler is measured at 25°C and then averaged. The measurements are performed under small signal conditions (i.e. using a Vector Network Analyzer). The process is repeated at -55°C, 85°C and 150°C. A best-fit line for the measured data is computed and then plotted from -55°C to 150°C.

Power Derating:

The power handling and corresponding power derating plots are a function of the thermal resistance, mounting surface temperature (base plate temperature), maximum continuous operating temperature of the coupler, and the thermal insertion loss. The thermal insertion loss is defined in the Power Handling section of the data sheet.

As the mounting interface temperature approaches the maximum continuous operating temperature, the power handling decreases to zero.

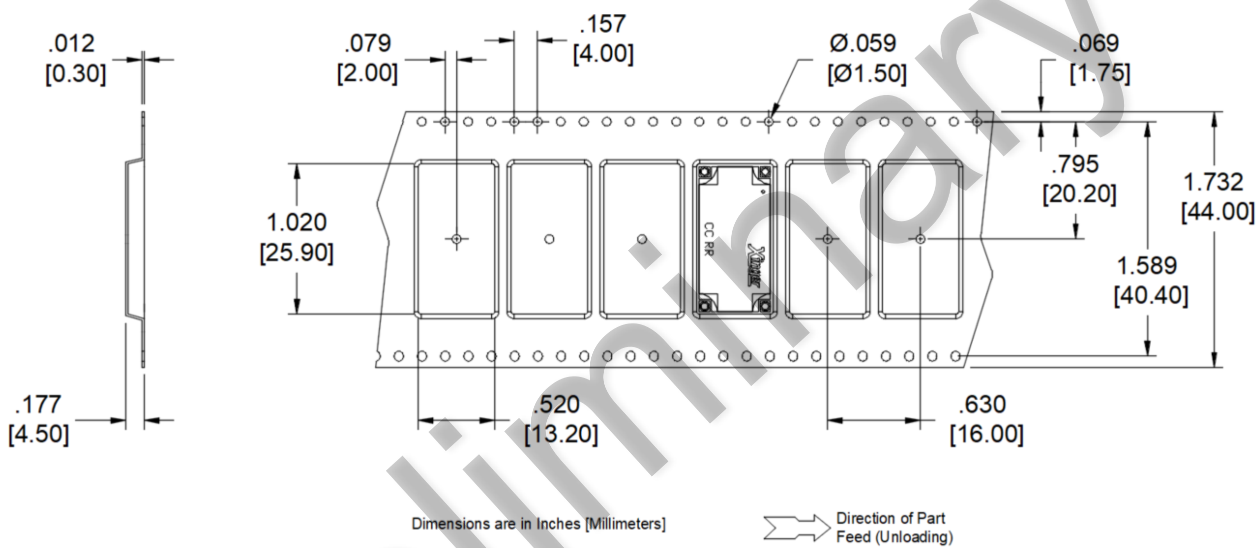
If mounting temperature is greater than 85°C, the Xinger coupler will perform reliably as long as the input power is derated to the curve above.

Definition of Measured Specifications:

Parameter	Definition	Mathematical Representation
VSWR (Voltage Standing Wave Ratio)	The impedance match of the coupler to a 50Ω system. A VSWR of 1:1 is optimal.	$\text{VSWR} = \frac{V_{max}}{V_{min}}$ Vmax = voltage maxima of a standing wave Vmin = voltage minima of a standing wave
Return Loss	The impedance match of the coupler to a 50Ω system. Return Loss is an alternate means to express VSWR.	$\text{Return Loss(dB)} = 20\log\frac{\text{VSWR}+1}{\text{VSWR}-1}$
Insertion Loss	The input power divided by the sum of the power at the two output ports.	$\text{Insertion Loss(dB)} = 10\log\frac{P_{in}}{P_{cpl}+P_{direct}}$
Isolation	The input power divided by the power at the isolated port.	$\text{Isolation(dB)} = 10\log\frac{P_{in}}{P_{iso}}$
Phase Balance	The difference in phase angle between the two output ports.	Phase at coupled port – Phase at direct port
Amplitude Balance	The power at each output divided by the average power of the two outputs.	$10\log\frac{P_{cpl}}{(P_{cpl}+P_{direct})/2}$ and $10\log\frac{P_{direct}}{(P_{cpl}+P_{direct})/2}$

Packaging and Ordering Information:

Parts are available in a reel. Packaging follows EIA 481 for reels. 500 parts are oriented in tape and reel as shown below.



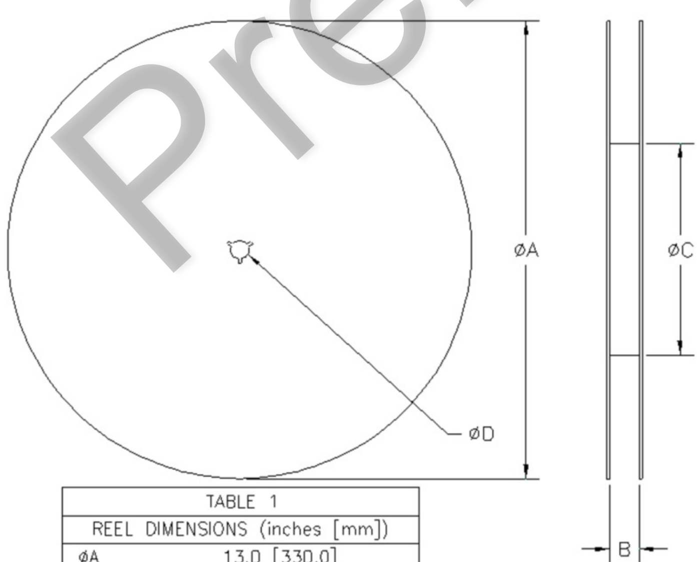


TABLE 1	
REEL DIMENSIONS (inches [mm])	
ØA	13.0 [330.0]
B	1.73 [44.0]
ØC	6.00 [152.4]
ØD	0.512 [13.0]

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