

Features

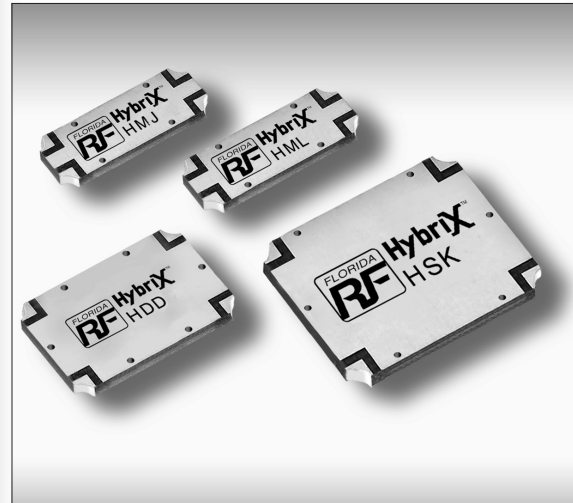
- Lead Free, RoHS compliant
- Frequency ranges from 150 MHz to 4.0 GHz
- Low Insertion Loss
- Surface Mountable
- High Power to 250 W (at 85°C)
- 90° Quadrature
- Excellent Isolation and VSWR
- Available in six package sizes

Applications

- Broadcast (TV and Radio)
- Combiners and Splitters
- Duplexers
- ISM Applications
- Matched Phase Shifter
- Mixers
- Modulators
- Narrow Band GPS
- PCS, GSM, Cellular, 2.5G and 3G Base Stations
- Signal Distribution Nodes
- SMR Applications
- Wide Local Loop (WLL), WLAN

Quick Selector Chart

HybriX® Part Number	Frequency Range (GHz)	Power (Watts)
HEA	.150 - .250	200
HSB	.470 - .860	200
HSC	.700 - 1.0	250
HDD	.815 - .960	200
HSD	.815 - .960	200
HDF	.96 - 1.22	200
HDJ	1.7 - 2.0	200
HMJ	1.7 - 2.0	200
HSJ	1.7 - 2.0	200
HPJ	1.8 - 2.7	100
HTK	1.8 - 2.2	150
HDK	1.9 - 2.2	200
HSK	1.9 - 2.2	200
HML	2.0 - 2.3	200
HTM	2.0 - 2.5	150
HDS	2.0 - 4.0	200
HMP	2.3 - 2.7	200
HMQ	2.7 - 3.2	200
HMR	3.4 - 3.6	200



Florida RF Labs® 3dB Hybrid Couplers are made for applications which require high isolation and low insertion loss. They are surface mountable and available in tape & reel and tube packaging. The devices have a small footprint, a low profile, and are lead free and RoHS compliant.

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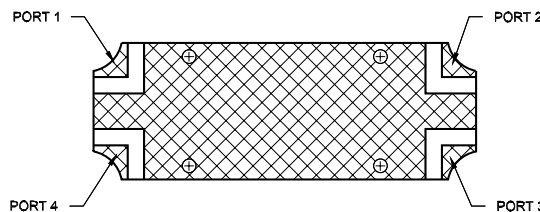
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Catalog Numbering Code*

H	M	J	-	TR
SERIES	SIZE	FREQUENCY (GHz)		PACKAGING
H = Hybrid Coupler 3dB, 90°		HS Size: A = .15 - .25 B = .47 - .86 C = .70 - 1.0		(blank) = Tube TR = Tape & Reel
	D = Double Size HybriX® .560 x .350 in. (14.22 x 8.89 mm) E = Extra Large HybriX® 1.0 x 1.0 in. (25.4 x 25.4 mm) M = Mini-HybriX® .560 x .200 in. (14.22 x 5.08 mm) P = Pico HybriX® .250 x .200 in. (6.35 x 5.08 mm) S = Standard HybriX® .650 x .480 in. (16.51 x 12.20 mm) T = Twin Size HybriX® .500 x .250 in. (12.7 x 6.35 mm)	HD or HS Size: D = .815 - .96 E = 1.0 - 2.0 F = .96 - 1.22 G = 1.4 - 1.7 H = 1.5 - 2.0		
		HD, HM, HP, HS or HT Size: J = 1.7 - 2.0 K = 1.9 - 2.2 L = 2.0 - 2.3 M = 2.0 - 2.5 N = 2.0 - 2.7 P = 2.3 - 2.7 Q = 2.7 - 3.2 R = 3.4 - 3.6 S = 2.0 - 4.0		

*Note: All catalog number combinations may not be available. Check appropriate catalog pages before ordering.

Pin Configuration

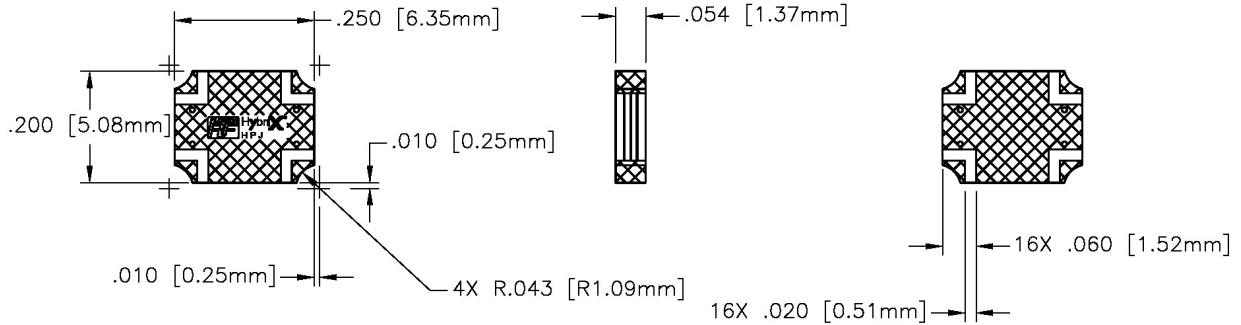


Port 1	Port 2	Port 3	Port 4
input	isolated	3 dB output, 90°	3 dB coupled, 0°
isolated	input	3 dB coupled, 0°	3 dB output, 90°
3 dB output, 90°	3 dB coupled, 0°	input	isolated
3 dB coupled, 0°	3 dB output, 90°	isolated	input

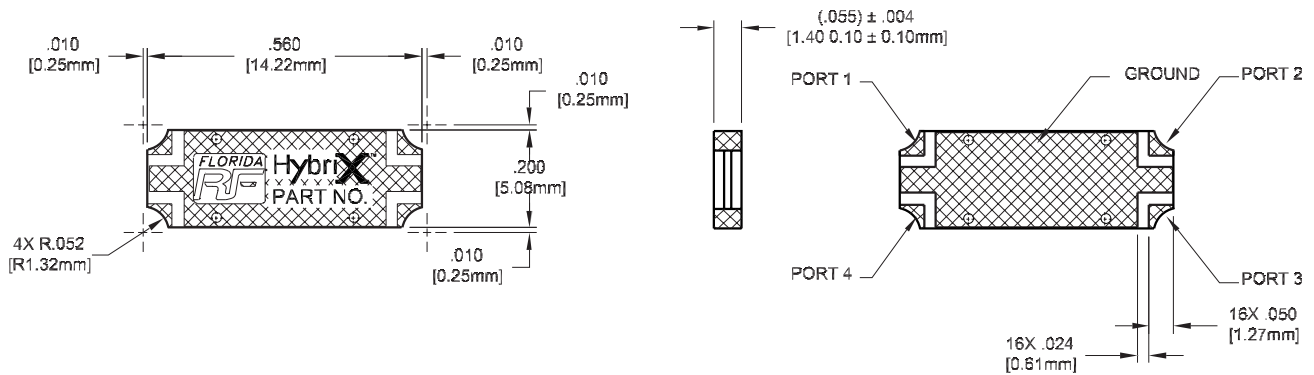
Frequency	Size (LxW)	Isolation	Insertion Loss	VSWR	Amplitude Balance	Phase Balance	Average Power*	Model Number
GHz	Inches	dB Min	dB Max	Max:1	dB Max	deg Max	Watts/CW	
.150 - .250	1.0 x 1.0	25	0.25	1.10	±0.10	2	200	HEA
.470 - .860	.650 x .480	20	0.30	1.29	±0.50	3	200	HSB
.700 - 1.0	.650 x .480	22	0.20	1.18	±0.20	3	250	HSC
.815 - .960	.560 x .350	22	0.20	1.20	±0.30	3	200	HDD
.815 - .960	.650 x .480	22	0.20	1.20	±0.30	3	200	HSD
.960 - 1.22	.560 x .350	18	0.25	1.25	±0.30	3	200	HDF
1.0 - 2.0	.560 x .350	20	0.24	1.25	±0.50	3	200	HDE
1.7 - 2.0	.560 x .200	24	0.14	1.15	±0.20	2	200	HMJ
1.7 - 2.0	.560 x .350	23	0.23	1.15	±0.30	3	200	HDJ
1.7 - 2.0	.650 x .480	23	0.20	1.18	±0.30	3	200	HSJ
1.8 - 2.7	.250 x .200	17	0.40	1.40	±0.45	5.5	100	HPJ
1.9 - 2.2	.500 x .250	20	0.25	1.20	±0.35	2	150	HTK
1.9 - 2.2	.560 x .350	20	0.25	1.20	±0.20	3	200	HDK
1.9 - 2.2	.650 x .480	18	0.30	1.29	±0.30	3	200	HSK
2.0 - 2.3	.560 x .200	24	0.14	1.15	±0.20	2	200	HML
2.0 - 2.5	.500 x .250	20	0.20	1.20	±0.35	2	150	HTM
2.0 - 4.0	.560 x .350	20	0.35	1.15	±0.50	3	200	HDS
2.3 - 2.7	.560 x .200	23	0.14	1.15	±0.20	2	200	HMP
2.7 - 3.2	.560 x .200	22	0.14	1.25	±0.35	3	200	HMQ
3.4 - 3.6	.560 x .200	22	0.14	1.20	±0.20	4	200	HMR

* at 85°C

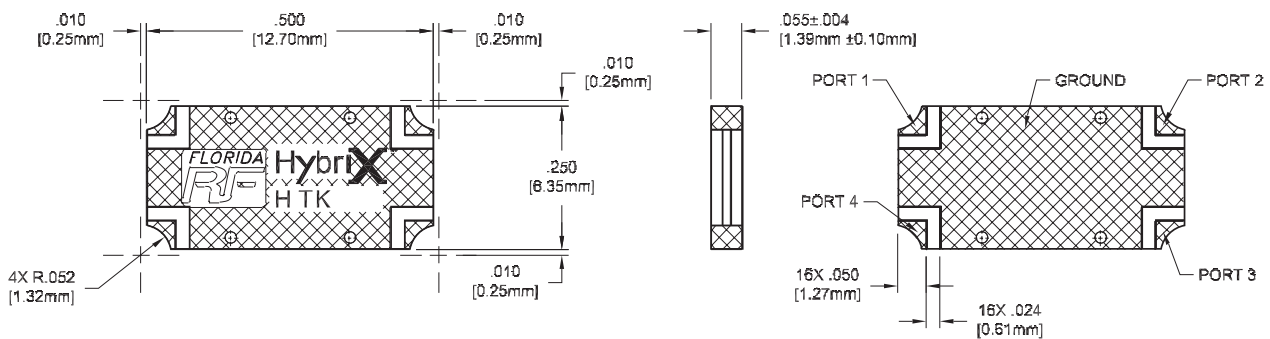
HP Series (Pico-HybriX® Size)



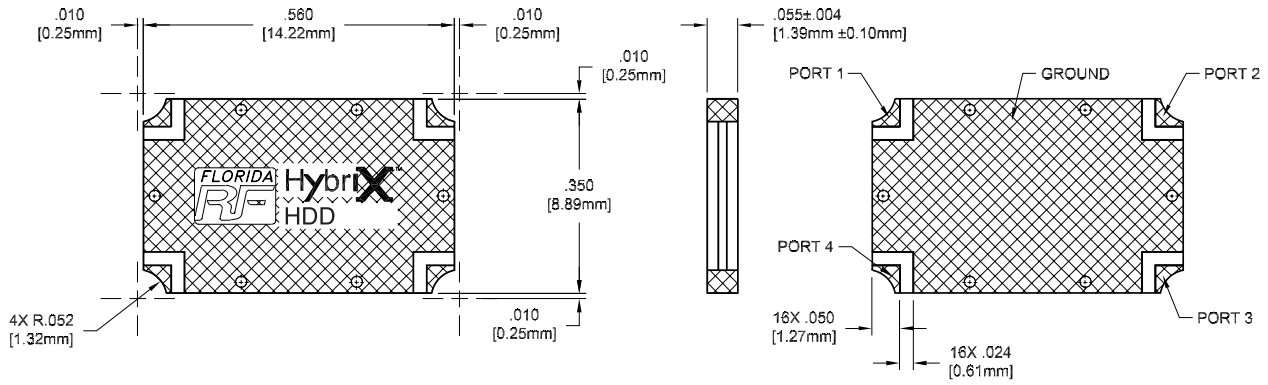
HM Series (Mini-HybriX® Size)



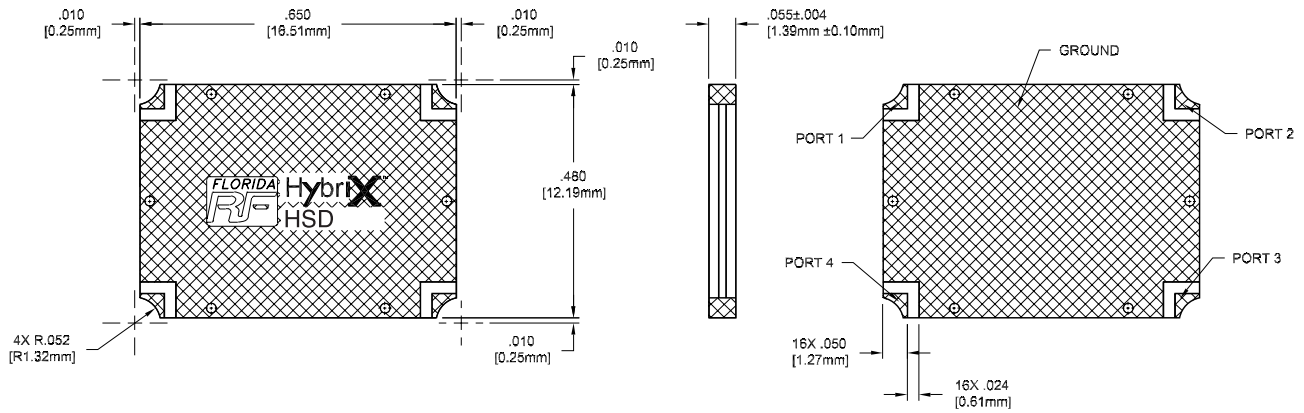
HT Series (Twin-HybriX® Size)



HD Series (Double HybriX® Size)



HS Series (Standard HybriX® Size)



Features

- Lead Free and RoHS compliant
- Frequency ranges from 440 MHz to 2.7 GHz
- Low Loss
- Surface Mountable
- Power Rating up to 250 W (at 85°C)
- Good Directivity and VSWR
- Integrated 5W Termination in DS Series
- No Internal Termination for D and DN Series
- Low Cost Microstrip Construction

Applications

- Hybrid Amplifiers
- PCS, GSM, Cellular, and 3G Base Stations
- Power Monitors
- Reflectometers
- WLAN Applications

Quick Selector Chart

HybriX® Part Number	Frequency Range (GHz)	Power (Watts)	Mean Coupling (dB)
DN25B30	.440 - .460	250	30
DN25D05	.815 - .960	250	5
DN25D06	.815 - .960	250	6
DS15D10	.815 - .960	150	10
DN15D10	.815 - .960	150	10
D15D20	.815 - .960	150	20
DN25D30	.815 - .960	250	30
DS10J10	1.7 - 2.0	100	10
DN10J10	1.7 - 2.0	100	10
DN10J20	1.7 - 2.0	100	20
DN25J30	1.7 - 2.0	250	30
DS10J20	1.7 - 2.0	100	20
D10L20	2.0 - 2.3	100	20
DS10P10	2.3 - 2.7	100	10



Florida RF Labs® Directional Couplers are made for applications that require low loss and good directivity. They are surface mountable and available in tape & reel and tube packaging. The devices have a small footprint, a low profile, and are lead free and RoHS compliant.

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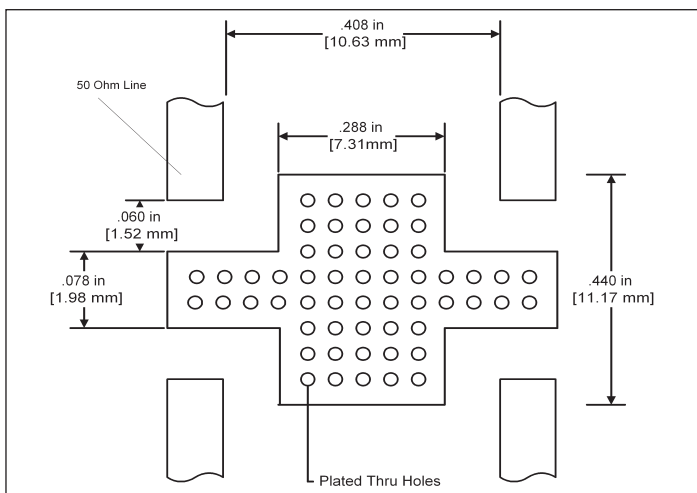
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Catalog Numbering Code*

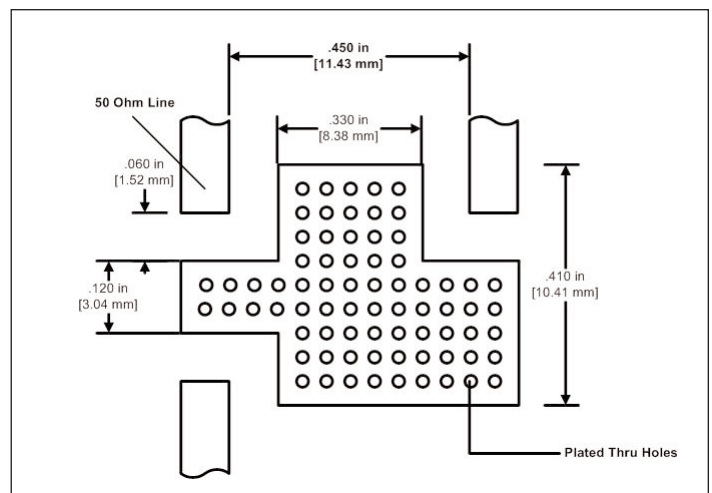
DS	10	D	10	-	TR
SERIES	POWER	FREQUENCY	COUPLING		PACKAGING
D = Directional Coupler, SMT, Softboard	10 = 100W 15 = 150W 25 = 250W	A = .38 - .52 B = .47 - .86 C = .70 - 1.0	05 = 5dB 06 = 6dB 10 = 10dB 15 = 15dB 20 = 20dB 30 = 30dB		(blank) = Tube TR = Tape & Reel
DN = Directional Coupler, Surface Mount, No internal termination		D, DS or DN Size: D = .815 - .96 E = 1.0 - 2.0 F = .96 - 1.22 G = 1.4 - 1.7 H = 1.5 - 2.0 J = 1.7 - 2.0 K = 1.9 - 2.2 L = 2.0 - 2.3 M = 2.0 - 2.5 N = 2.0 - 2.7 P = 2.3 - 2.7 Q = 2.7 - 3.2 R = 3.4 - 3.6			
DS = Directional Coupler, Surface Mount Internal Termination					

*Note: All catalog number combinations may not be available. Check appropriate catalog pages before ordering.

Mounting Footprint for Size .56 x .35 inches (14.22x8.89mm)



Mounting Footprint for DS Model



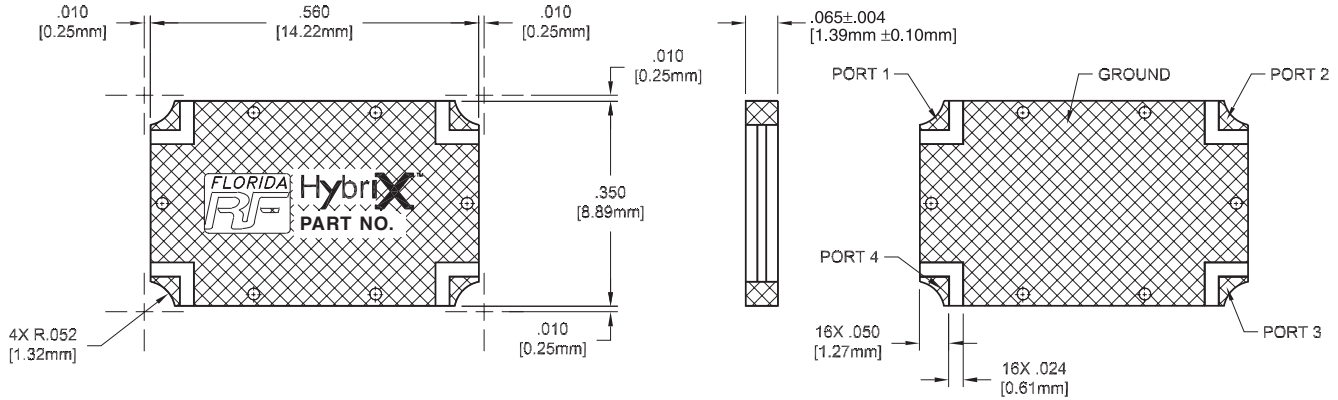
Directional Coupler

Frequency	Size (LxW)	Average Power ¹	Mean Coupling	Insertion Loss	VSWR	Frequency Sensitivity	Isolation	Internal Termination	Model Number
GHz	Inches	Watts/CW	dB	dB Max	Max:1	dB Max	deg Min	Watts	
.440 - .460	1.0 x 0.5	250	30 ± 1.0	0.13	1.10	± 0.22	57	N/A	DN25B30
.815 - .960	.56 x .35	250	5 ± 0.4	0.30	1.15	± 0.10	34	N/A	DN25D05
.815 - .960	.56 x .35	250	6 ± 0.4	0.30	1.15	± 0.10	33	N/A	DN25D06
.815 - .960	.56 x .35	150	10 ± 1.0	0.25	1.17	± 0.40	28	N/A	DN15D10
.815 - .960	.56 x .35	150	10 ± 1.0	0.20	1.17	± 0.30	28	5	DS15D10
.815 - .960	.56 x .35	150	20 ± 1.0	0.30	1.25	± 0.20	38	N/A	D15D20
.815 - .960	.65 x .48	250	30 ± 1.0	0.20	1.05	± 0.50	58	N/A	DN25D30
1.7 - 2.0	.56 x .35	100	10 ± 1.0	0.20	1.18	± 0.30	28	5	DS10J10*
1.7 - 2.0	.56 x .35	100	10 ± 1.0	0.25	1.10	± 0.30	28	N/A	DN10J10*
1.7 - 2.0	.65 x .48	250	30 ± 1.0	0.35	1.13	± 0.10	55	N/A	DN25J30
1.7 - 2.0	.56 x .35	100	20 ± 1.0	0.25	1.10	± 0.30	28	N/A	DN10J20
1.7 - 2.0	.56 x .35	100	20 ± 1.5	0.25	1.20	± 0.30	28	5	DS10J20
2.0 - 2.3	.56 x .35	100	20 ± 0.4	0.20	1.20	± 0.10	34	N/A	D10L20
2.3 - 2.7	.56 x .35	100	10 ± 1.0	0.25	1.20	± 0.40	30	5	DS10P10

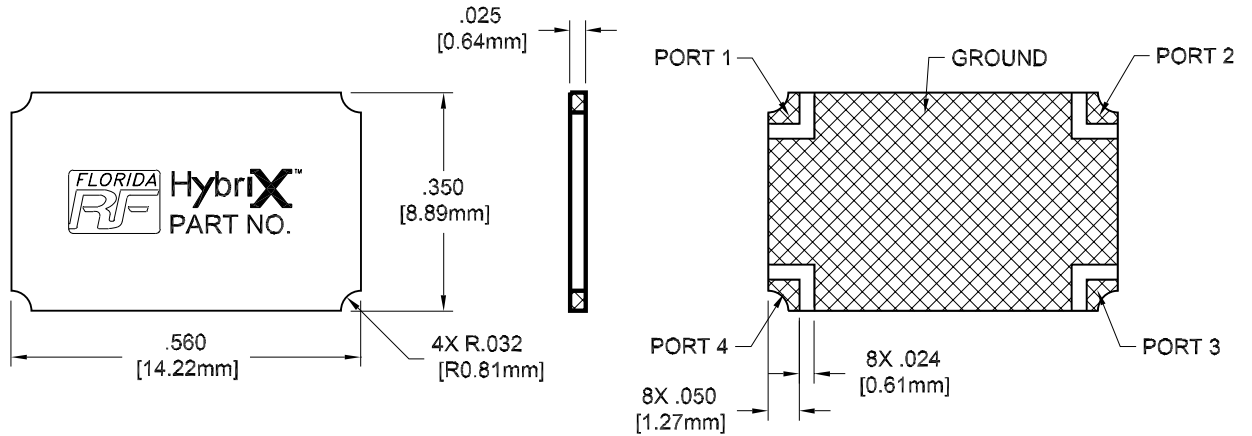
¹ at 85°C

* Extended frequency range available.

Standard Directional Coupler (D Series)



No Internal Termination (DN Series)



Internal Termination Configuration (DS Series)

