MATERION

RF Packaging for 5G Applications

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Materion has developed a wide range of ceramic packages to meet your demands for low thermal resistance. Our products also provide very low RF loss for radio frequency, microwave, and 5G microelectronics packaging. We can incorporate flanges of advanced materials to achieve the high power density requirements of RF power transistors, wireless towers, and base stations.

HIGH POWER, LDMOS STYLE, RF & MICROWAVE PACKAGE

RF701

The RF701 package is an industry standard outline that offers proven performance and reliability. This cost effective, 2-leaded device is an excellent platform for wireless applications. The RF701 package is available with our Dendrite Resistive Process.

PACKAGE BENEFITS

- Robust design provides excellent mechanical reliability
- The flange is thermal expansion matched to a variety of semiconductor materials
- Industry proven design
- Custom RF design available

COMPATIBLE WITH HIGH POWER DEVICES

- GaAs
- Si
- SiC
- SiGe
- GaN

STANDARD PRODUCT SPECIFICATIONS

Materials:	Lead Frame: Alloy 42
	Flange: CuW
	Insulating Layer: Alumina
Plating:	Electrolytic nickel thickness is 100 – 250 µin (2.54 – 6.35 µm)
	Gold thickness is up to 150 µin (3.81 µm)

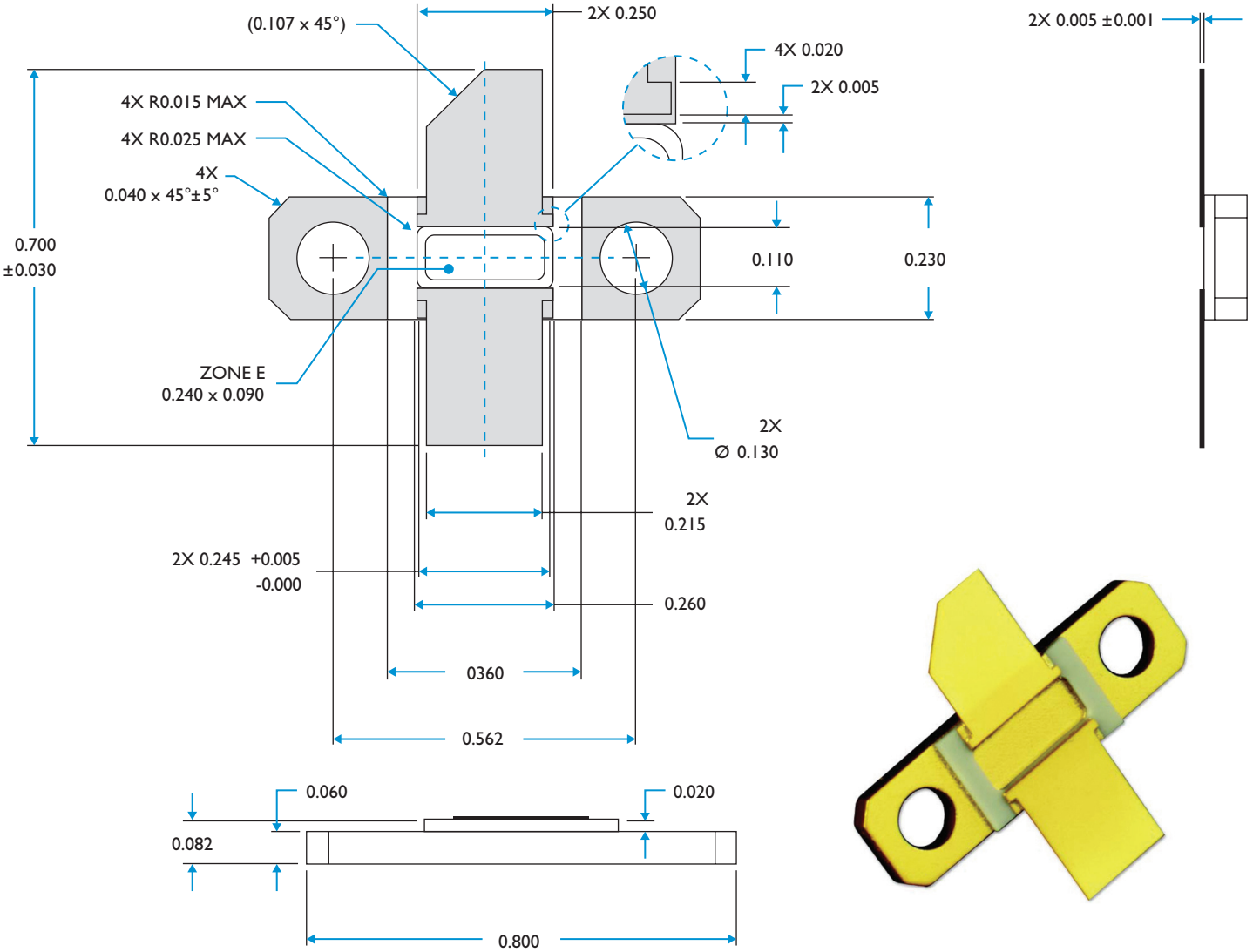
Package	
Maximum Power Dissipation	115 W
Typical Effective Thermal Conductivity	180 W/mK
Lead Height	0.080*
Flange/Back-pad Thickness	0.060*
Die-attach Dimension (side to side)	0.260*
Die-attach Dimension (input to output)	0.110*
Window-frame Thickness	0.020*
Package Type	Flange
Number of Leads	2
Maximum Assembly Temperature Range	450°C
Isolated/Non-Isolated	Non-Isolated
Lead Style	Straight lead

* Units in inches

KEY PRODUCT CHARACTERISTICS

Post-Plated Key Product Characteristic	Typical
Wire Bond Pull	9.76 g
Die Shear	2.91 kg
Surface Roughness	0.248 µm
Lead Peel	19.3 lbs
Isolation Resistance @ 100 VDC+0.2KVDC @0.02mA; dwell time: 3 sec	< 10 µamps

Metric Conversion Chart (Inch to Millimeter)		
0.001 = 0.025	0.082 = 2.083	0.245 = 6.223
0.005 = 0.127	0.090 = 2.286	0.250 = 6.350
0.015 = 0.381	0.107 = 2.718	0.260 = 6.604
0.020 = 0.508	0.110 = 2.794	0.360 = 9.144
0.025 = 0.635	0.130 = 3.302	0.562 = 14.275
0.030 = 0.762	0.215 = 5.461	0.700 = 17.780
0.040 = 1.016	0.230 = 5.842	0.800 = 20.320
0.060 = 1.524	0.240 = 6.096	



Units of measure = inches

RF705

The RF705 package is an industry standard outline that offers the optimum combination of performance, price, and reliability. This package features a large cavity with high thermal conductivity that accommodates large, high-powered die. The RF705 package is available with our Dendrite Resistive Process.

PACKAGE BENEFITS

- Robust design provides excellent mechanical reliability
- The flange is thermal expansion matched to a variety of semiconductor materials
- Industry proven design
- Custom RF design available

COMPATIBLE WITH HIGH POWER DEVICES

- GaAs
- Si
- SiC
- SiGe
- GaN

Package	
Maximum Power Dissipation	320 W
Typical Effective Thermal Conductivity	180 W/mK
Lead Height	0.060*
Flange/Back-pad Thickness	0.040*
Die-attach Dimension (side to side)	0.650
Die-attach Dimension (input to output)	0.240*
Window-frame Thickness	0.020*
Package Type	Flange
Number of Leads	2
Maximum Assembly Temperature Range	450°C
Isolated/Non-Isolated	Non-Isolated
Lead Style	Straight lead

* Units in inches

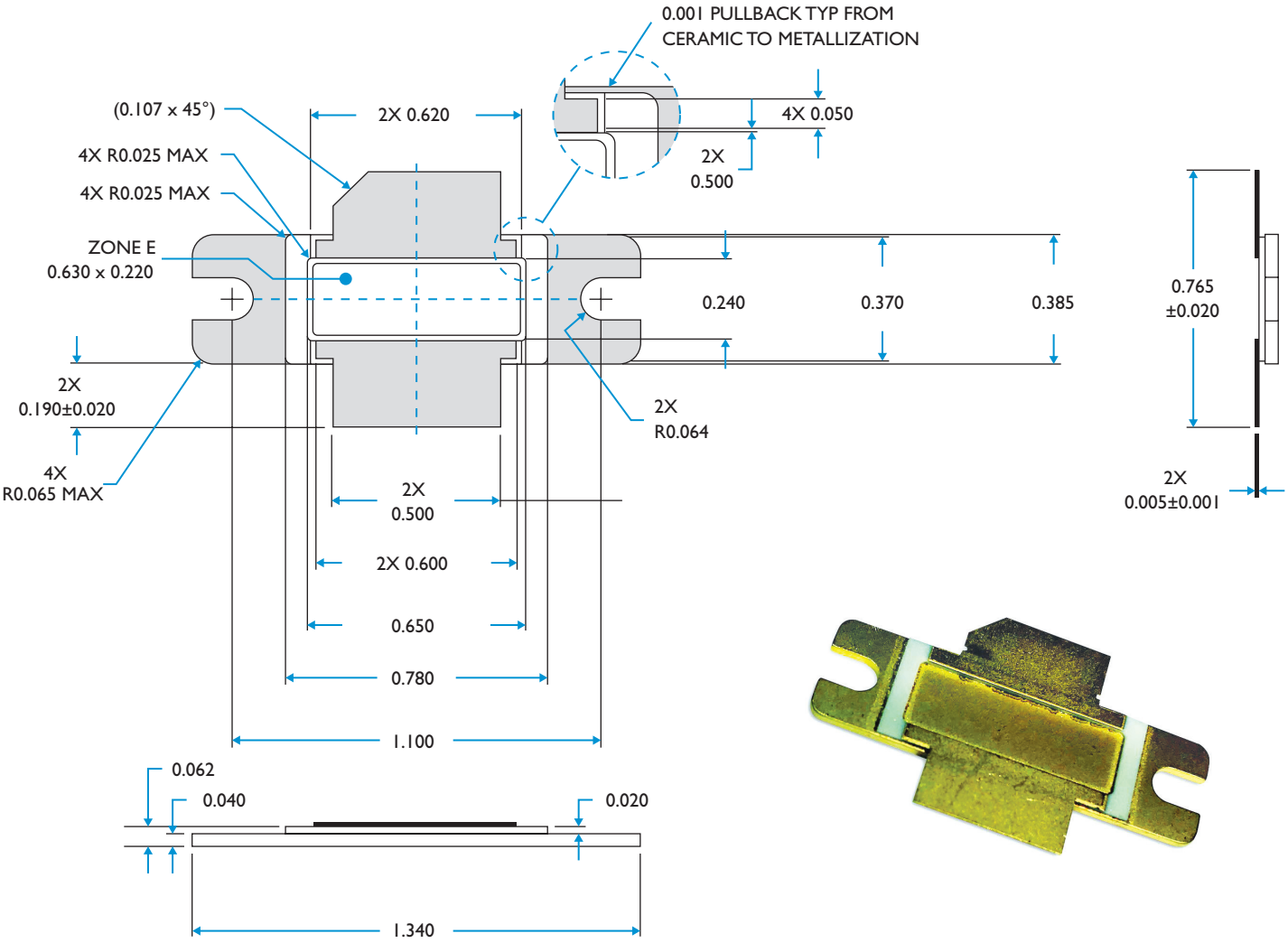
STANDARD PRODUCT SPECIFICATIONS

Materials:	Lead Frame: Alloy 42
	Flange: CuW
	Insulating Layer: Alumina
Plating:	Electrolytic nickel thickness is 100 – 250 µin (2.54 – 6.35 µm)
	Gold thickness is up to 150 µin (3.81 µm)

KEY PRODUCT CHARACTERISTICS

Post-Plated Key Product Characteristic	Typical
Wire Bond Pull	9.5 g
Die Shear	3.25 kg
Surface Roughness	0.306 µm
Lead Peel	8.12 lbs
Isolation Resistance @ 100 VDC+0.2KVDC @0.02mA; dwell time: 3 sec	< 10 µamps

Metric Conversion Chart (Inch to Millimeter)		
0.001 = 0.025	0.065 = 1.651	0.600 = 15.240
0.005 = 0.127	0.107 = 2.718	0.620 = 15.748
0.020 = 0.508	0.190 = 4.826	0.630 = 16.002
0.025 = 0.635	0.220 = 5.588	0.650 = 16.510
0.040 = 1.016	0.240 = 6.096	0.765 = 19.431
0.050 = 1.270	0.370 = 9.398	1.100 = 27.940
0.062 = 1.575	0.385 = 9.779	1.340 = 34.036
0.064 = 1.626	0.500 = 12.700	



Units of measure = inches

RF707

The RF707 package is an industry standard outline that offers the optimum combination of performance, price, and reliability. This package is a 4-leaded package ideally suited for high power push pull applications. Thermally, it is a very stable platform over temperature and as such offers high reliability. The RF707 package is available with our Dendrite Resistive Process.

PACKAGE BENEFITS

- Robust design provides excellent mechanical reliability
- The flange is thermal expansion matched to a variety of semiconductor materials
- Industry proven design
- Custom RF design available

COMPATIBLE WITH HIGH POWER DEVICES

- GaAs
- Si
- SiC
- SiGe
- GaN

STANDARD PRODUCT SPECIFICATIONS

Materials:	Lead Frame: Alloy 42
	Flange: CuW
	Insulating Layer: Alumina
Plating:	Electrolytic nickel thickness is 100 – 250 µin (2.54 – 6.35 µm) Gold thickness is up to 150 µin (3.81 µm)

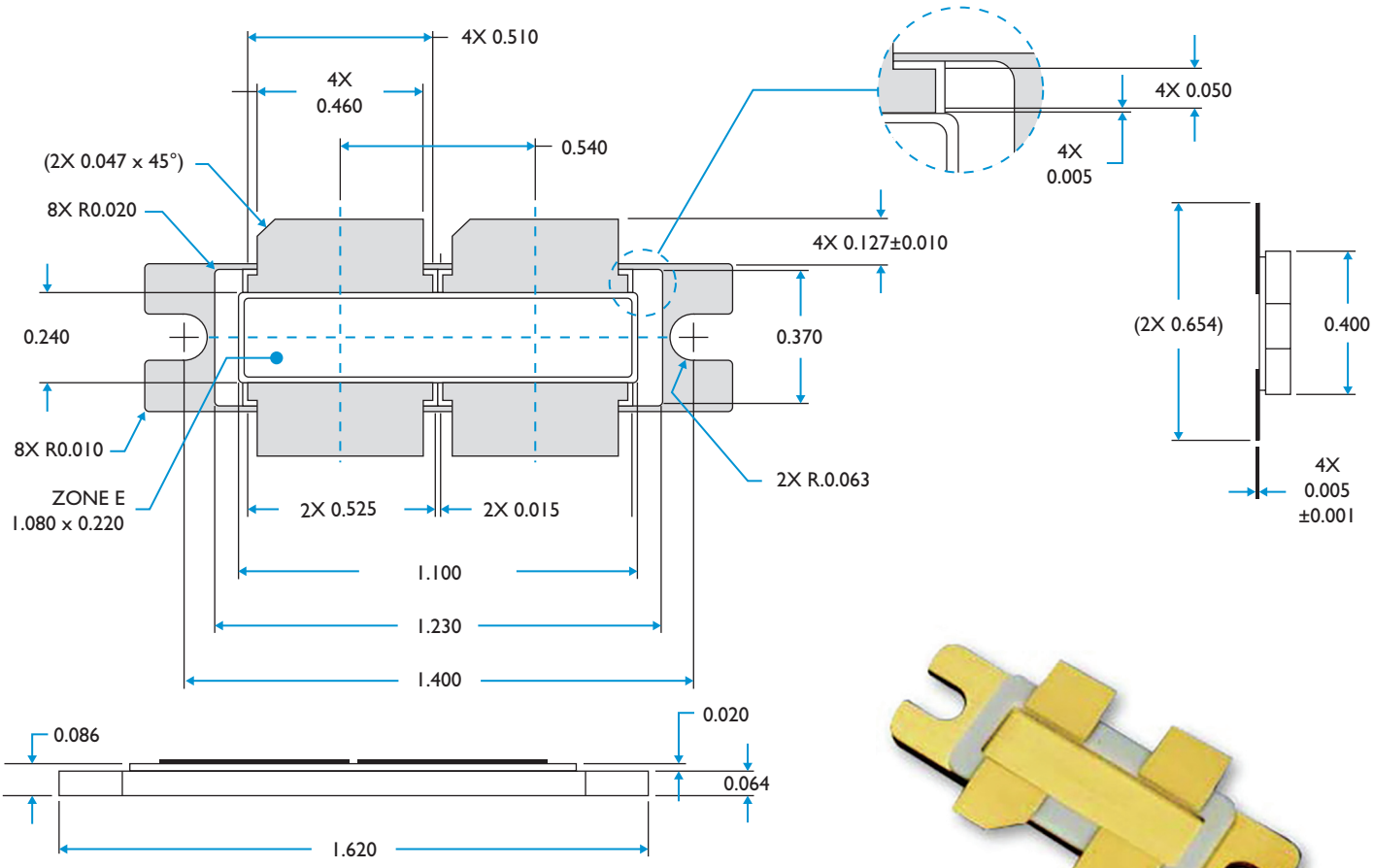
Package	
Maximum Power Dissipation	470 W
Typical Effective Thermal Conductivity	180 W/mK
Lead Height	0.084*
Flange/Back-pad Thickness	0.064*
Die-attach Dimension (side to side)	1.100*
Die-attach Dimension (input to output)	0.240*
Window-frame Thickness	0.020*
Package Type	Flange
Number of Leads	4
Maximum Assembly Temperature Range	450°C
Isolated/Non-Isolated	Non-Isolated
Lead Style	Straight lead

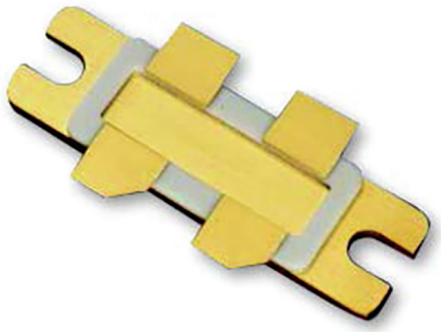
* Units in inches

KEY PRODUCT CHARACTERISTICS

Post-Plated Key Product Characteristic	Typical
Wire Bond Pull	8.33 g
Die Shear	4.92 kg
Surface Roughness	0.696 µm
Lead Peel	21.8 lbs
Isolation Resistance @ 100 VDC+0.2KVDC @0.02mA; dwell time: 3 sec	< 10 µamps

Metric Conversion Chart (Inch to Millimeter)		
0.001 = 0.025	0.086 = 2.184	0.525 = 13.335
0.005 = 0.127	0.127 = 3.226	0.540 = 13.716
0.010 = 0.254	0.220 = 5.588	0.654 = 16.612
0.015 = 0.381	0.240 = 6.096	1.080 = 27.432
0.020 = 0.508	0.370 = 9.398	1.100 = 27.940
0.047 = 1.194	0.400 = 10.160	1.230 = 31.242
0.063 = 1.588	0.460 = 11.684	1.400 = 35.560
0.064 = 1.626	0.510 = 12.954	1.620 = 41.148





Units of measure = inches

RF708

The RF708 package is an industry standard outline that offers the optimum combination of performance, price, and reliability. The RF708 is a 2-leaded package with a cavity that is sized to accommodate extra matching circuitry. This package offers excellent thermal performance and its thermal expansion characteristics are well matched to most dies. This package is available with our Dendrite Resistive process.

PACKAGE BENEFITS

- Robust design provides excellent mechanical reliability
- The flange is thermal expansion matched to a variety of semiconductor materials
- Industry proven design
- Custom RF design available

COMPATIBLE WITH HIGH POWER DEVICES

- GaAs
- Si
- SiC
- SiGe
- GaN

STANDARD PRODUCT SPECIFICATIONS

Materials:	Lead Frame: Alloy 42
	Flange: CuW
	Insulating Layer: Alumina
Plating:	Electrolytic nickel thickness is 100 – 250 µin (2.54 – 6.35 µm) Gold thickness is up to 150 µin (3.81 µm)

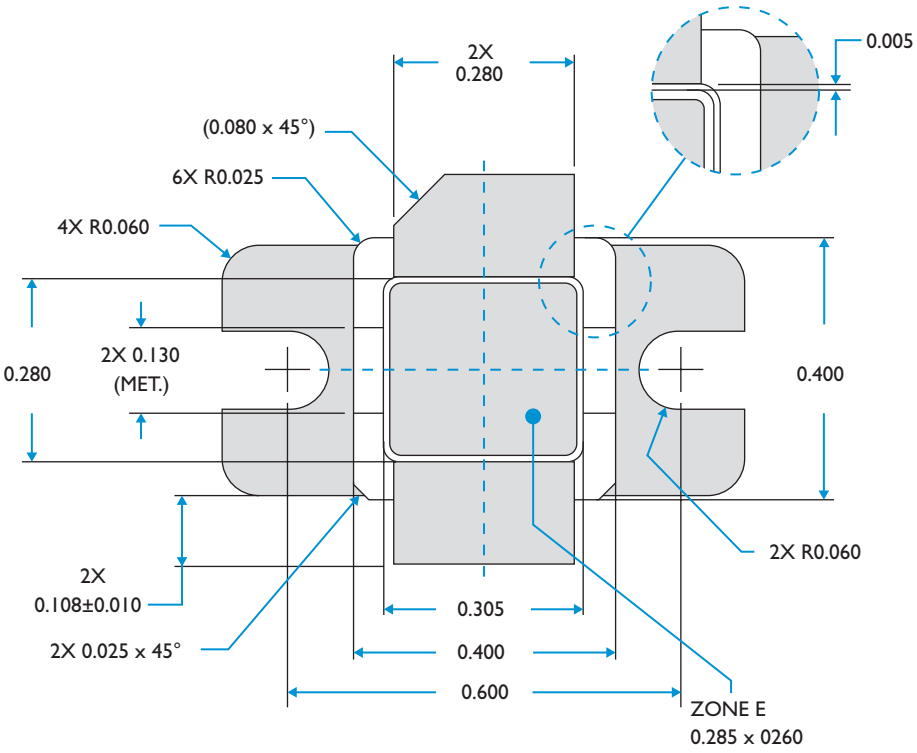
Package	
Maximum Power Dissipation	150 W
Typical Effective Thermal Conductivity	180 W/mK
Lead Height	0.060*
Flange/Back-pad Thickness	0.040*
Die-attach Dimension (side to side)	0.305*
Die-attach Dimension (input to output)	0.280*
Window-frame Thickness	0.020*
Package Type	Flange
Number of Leads	2
Maximum Assembly Temperature Range	450°C
Isolated/Non-Isolated	Non-Isolated
Lead Style	Straight lead

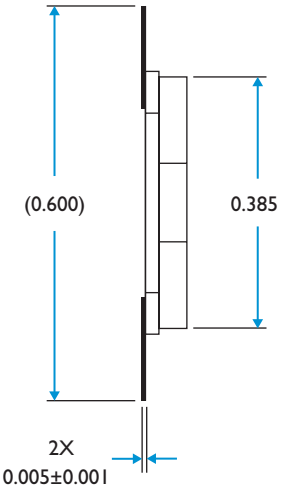
* Units in inches

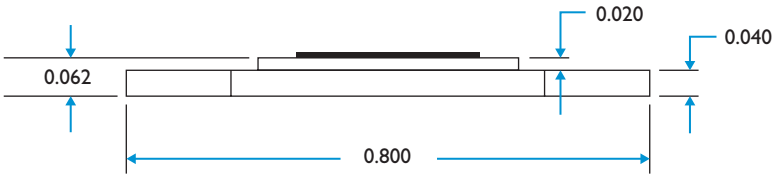
KEY PRODUCT CHARACTERISTICS

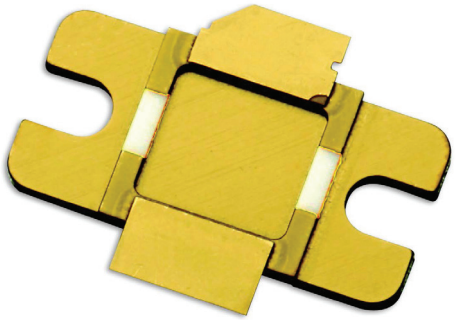
Post-Plated Key Product Characteristic	Typical
Wire Bond Pull	11.9 g
Die Shear	4.4 kg
Surface Roughness	0.176 µm
Lead Peel	21.8 lbs
Isolation Resistance @ 100 VDC+0.2KVDC @0.02mA; dwell time: 3 sec	< 10 µamps

Metric Conversion Chart (Inch to Millimeter)		
0.001 = 0.025	0.062 = 1.575	0.305 = 7.747
0.005 = 0.127	0.080 = 2.032	0.385 = 9.779
0.010 = 0.254	0.108 = 2.743	0.400 = 10.160
0.020 = 0.508	0.130 = 3.302	0.600 = 15.240
0.025 = 0.635	0.260 = 6.604	0.800 = 20.320
0.040 = 1.016	0.280 = 7.112	
0.060 = 1.524	0.285 = 7.239	









Units of measure = inches

RF710

The RF710 package is an industry standard outline that offers the optimum combination of performance, price, and reliability. The RF710 is a 2-leaded package with one of the largest cavities available in a standard package outline. This package offers excellent thermal performance and its thermal expansion characteristics are well matched to most die. This package is available with our Dendrite Resistive process.

PACKAGE BENEFITS

- Robust design provides excellent mechanical reliability
- The flange is thermal expansion matched to a variety of semiconductor materials
- Industry proven design
- Custom RF design available

COMPATIBLE WITH HIGH POWER DEVICES

- GaAs
- Si
- SiC
- SiGe
- GaN

STANDARD PRODUCT SPECIFICATIONS

Materials:	Lead Frame: Alloy 42
	Flange: CuW
	Insulating Layer: Alumina
Plating:	Electrolytic nickel thickness is 100 – 250 µin (2.54 – 6.35 µm)
	Gold thickness is up to 150 µin (3.81 µm)

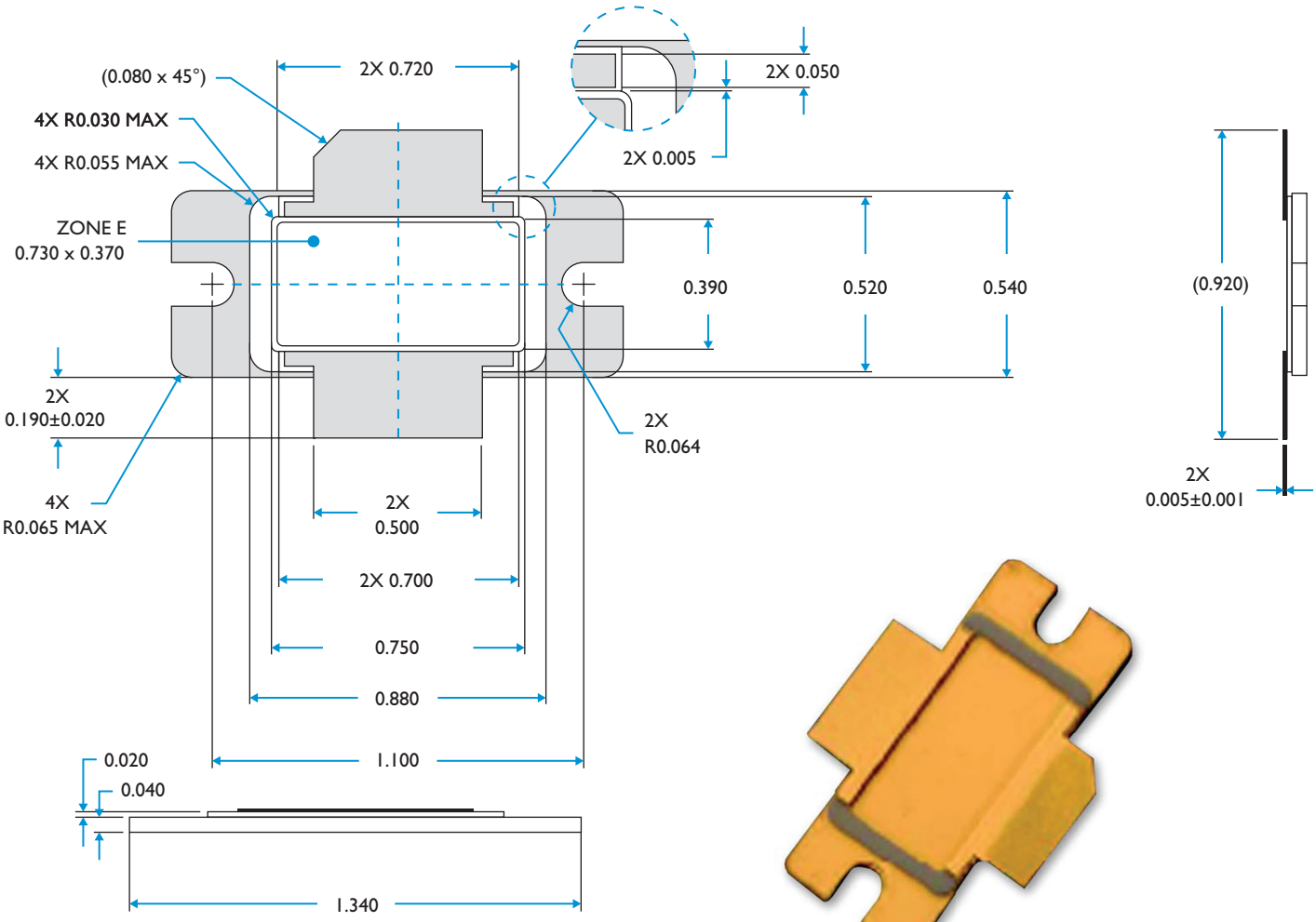
Package	
Maximum Power Dissipation	370 W
Typical Effective Thermal Conductivity	180 W/mK
Lead Height	0.060*
Flange/Back-pad Thickness	0.040*
Die-attach Dimension (side to side)	0.750*
Die-attach Dimension (input to output)	0.390*
Window-frame Thickness	0.020*
Package Type	Flange
Number of Leads	2
Maximum Assembly Temperature Range	450°C
Isolated/Non-Isolated	Non-Isolated
Lead Style	Straight lead

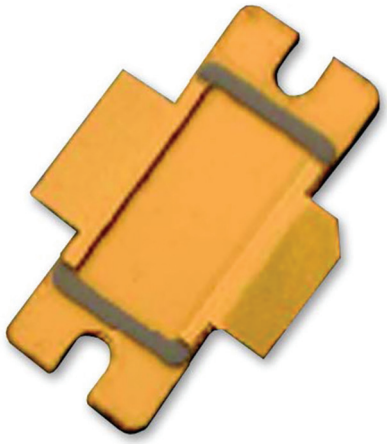
* Units in inches

KEY PRODUCT CHARACTERISTICS

Post-Plated Key Product Characteristic	Typical
Wire Bond Pull	7.35 g
Die Shear	4.58 kg
Surface Roughness	0.363 µm
Lead Peel	12.73 lbs
Isolation Resistance @ 100 VDC+0.2KVDC @0.02mA; dwell time: 3 sec	< 10 µamps

Metric Conversion Chart (Inch to Millimeter)		
0.001 = 0.025	0.065 = 1.651	0.540 = 13.716
0.005 = 0.127	0.080 = 2.032	0.700 = 17.780
0.020 = 0.508	0.190 = 4.826	0.730 = 18.542
0.030 = 0.762	0.720 = 18.288	0.750 = 19.050
0.040 = 1.016	0.370 = 9.398	0.880 = 22.352
0.050 = 1.270	0.390 = 9.906	0.920 = 23.368
0.055 = 1.397	0.500 = 12.700	1.100 = 27.940
0.064 = 1.626	0.520 = 13.208	1.340 = 34.036





Units of measure = inches

RF711

The RF711 package is an industry standard outline that offers the optimum combination of excellent thermal performance, price, and reliability. The RF711 is a 2-leaded package that is well suited for the high power RF applications. This package is available with our Dendrite Resistive process.

PACKAGE BENEFITS

- Robust design provides excellent mechanical reliability
- The flange is thermal expansion matched to a variety of semiconductor materials
- Industry proven design
- Custom RF design available

COMPATIBLE WITH HIGH POWER DEVICES

- GaAs
- Si
- SiC
- SiGe
- GaN

STANDARD PRODUCT SPECIFICATIONS

Materials:	Lead Frame: Alloy 42
	Flange: CuW
	Insulating Layer: Alumina
Plating:	Electrolytic nickel thickness is 100 – 250 µin (2.54 – 6.35 µm) Gold thickness is up to 150 µin (3.81 µm)

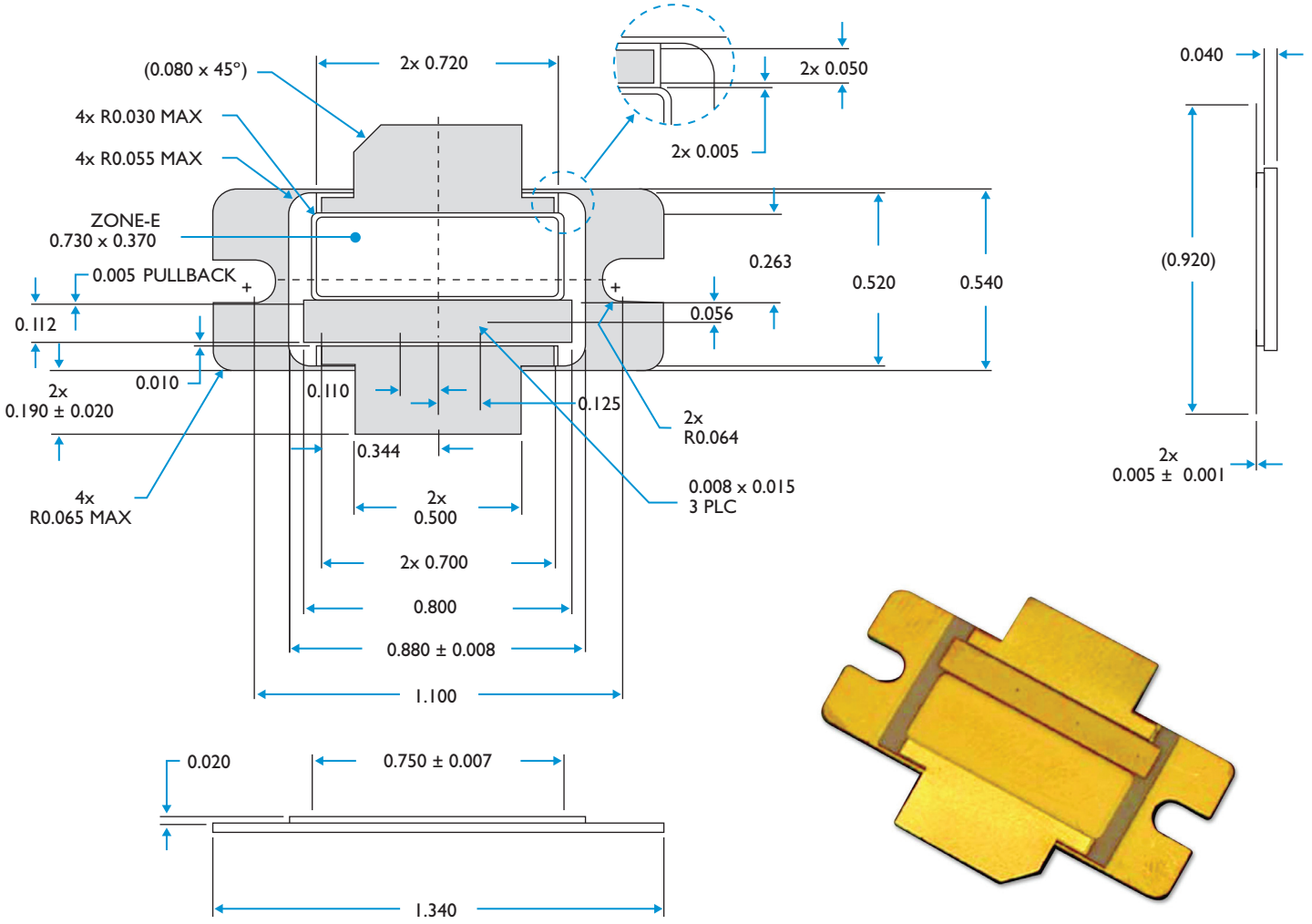
Package	
Maximum Power Dissipation	355 W
Typical Effective Thermal Conductivity	180 W/mK
Lead Height	0.060*
Flange/Back-pad Thickness	0.040*
Die-attach Dimension (side to side)	0.720*
Die-attach Dimension (input to output)	0.263*
Window-frame Thickness	0.020*
Package Type	Flange
Number of Leads	2
Maximum Assembly Temperature Range	450°C
Isolated/Non-Isolated	Non-Isolated
Lead Style	Straight lead

* Units in inches

KEY PRODUCT CHARACTERISTICS

Post-Plated Key Product Characteristic	Typical
Wire Bond Pull	8.6 g
Die Shear	4.56 kg
Surface Roughness	0.406 µm
Lead Peel	10.75 lbs
Isolation Resistance @ 100 VDC+0.2KVDC @0.02mA; dwell time: 3 sec	< 10 µamps

Metric Conversion Chart (Inch to Millimeter)		
0.001 = 0.025	0.064 = 1.626	0.540 = 13.716
0.005 = 0.127	0.065 = 1.651	0.700 = 17.780
0.007 = 0.178	0.080 = 2.032	0.720 = 18.288
0.008 = 2.030	0.110 = 2.794	0.730 = 18.542
0.010 = 0.254	0.112 = 2.845	0.750 = 19.050
0.015 = 0.381	0.125 = 3.175	0.800 = 20.320
0.020 = 0.508	0.190 = 4.826	0.880 = 22.352
0.030 = 0.762	0.263 = 6.680	0.920 = 23.368
0.040 = 1.016	0.344 = 8.738	1.100 = 27.940
0.050 = 1.270	0.370 = 9.398	1.340 = 34.036
0.055 = 1.397	0.500 = 12.700	
0.056 = 1.422	0.520 = 13.208	



Units of measure = inches

RF712

The RF712 package is an industry standard outline that offers the optimum combination of performance, price, and reliability. The RF712 is designed to accommodate push pull devices and has excellent thermal performance over the entire standard temperature range. This package is available with our Dendrite Resistive process.

PACKAGE BENEFITS

- Robust design provides excellent mechanical reliability
- The flange is thermal expansion matched to a variety of semiconductor materials
- Industry proven design
- Custom RF design available

COMPATIBLE WITH HIGH POWER DEVICES

- GaAs
- Si
- SiC
- SiGe
- GaN

STANDARD PRODUCT SPECIFICATIONS

Materials:	Lead Frame: Alloy 42
	Flange: CuW
	Insulating Layer: Alumina
Plating:	Electrolytic nickel thickness is 100 – 250 µin (2.54 – 6.35 µm) Gold thickness is up to 150 µin (3.81 µm)

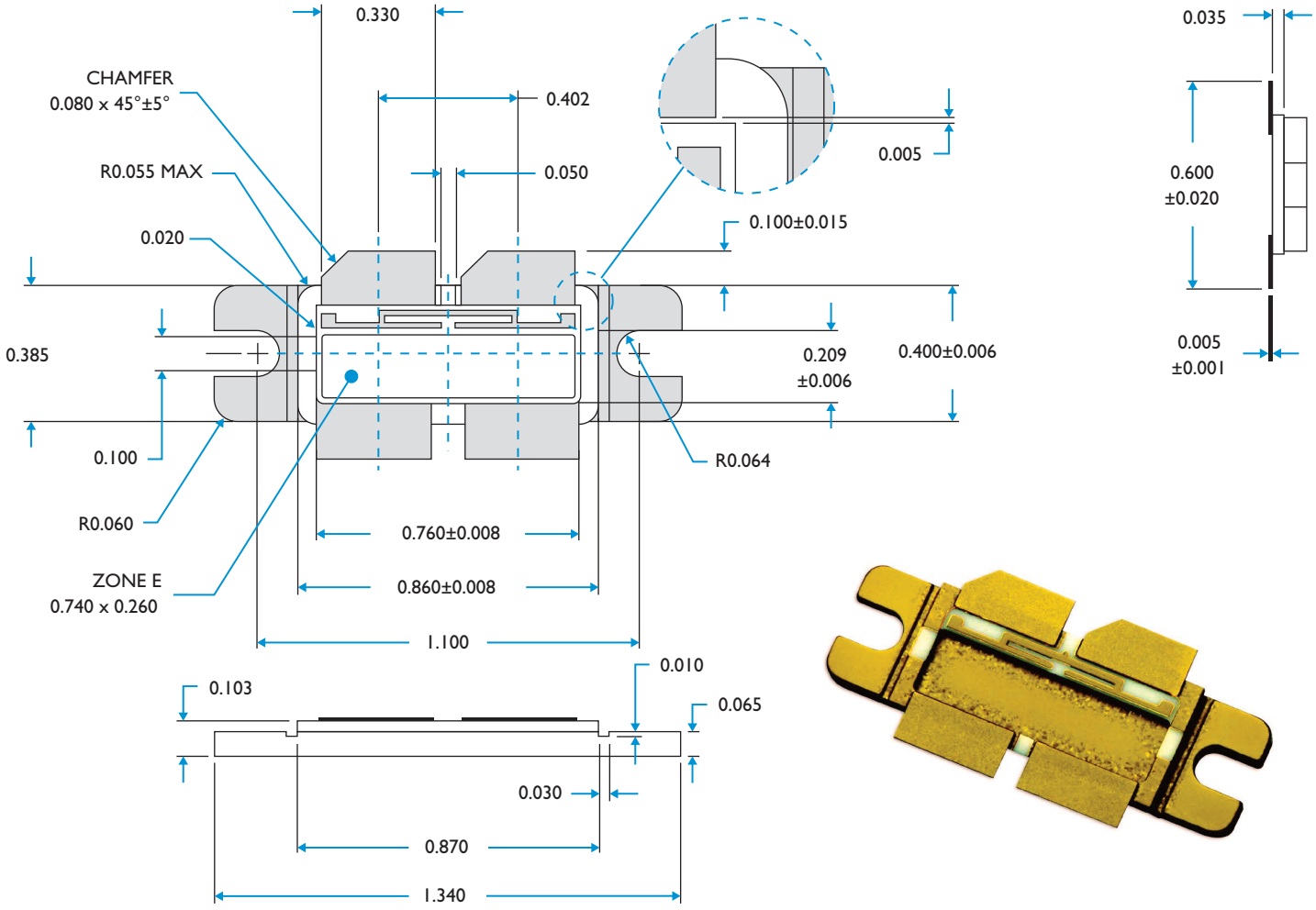
Package	
Maximum Power Dissipation	325 W
Typical Effective Thermal Conductivity	180 W/mK
Lead Height	0.100*
Flange/Back-pad Thickness	0.065*
Die-attach Dimension (side to side)	0.760*
Die-attach Dimension (input to output)	0.209*
Window-frame Thickness	0.035*
Package Type	Flange
Number of Leads	4
Maximum Assembly Temperature Range	450°C
Isolated/Non-Isolated	Non-Isolated
Lead Style	Straight lead

* Units in inches

KEY PRODUCT CHARACTERISTICS

Post-Plated Key Product Characteristic	Typical
Wire Bond Pull	11.9 g
Die Shear	3.17 kg
Surface Roughness	0.235 µm
Lead Peel	6.4 lbs
Isolation Resistance @ 100 VDC+0.2KVDC @0.02mA; dwell time: 3 sec	< 10 µamps

Metric Conversion Chart (Inch to Millimeter)		
0.001 = 0.025	0.055 = 1.397	0.385 = 9.779
0.005 = 0.127	0.060 = 1.524	0.400 = 10.160
0.006 = 0.152	0.064 = 1.626	0.402 = 10.211
0.008 = 2.030	0.065 = 1.651	0.600 = 15.240
0.010 = 0.254	0.080 = 2.032	0.740 = 18.796
0.015 = 0.381	0.100 = 2.540	0.760 = 19.304
0.020 = 0.508	0.103 = 2.616	0.850 = 21.844
0.030 = 0.762	0.209 = 5.309	0.870 = 22.098
0.035 = 0.889	0.260 = 6.604	1.100 = 27.940
0.050 = 1.270	0.330 = 8.382	1.340 = 34.036



Units of measure = inches

LOW COST, PLASTIC-FREE MICROWAVE PACKAGE

PF018

The PF018 offers the optimum combination of performance, reliability, and assembly costs. Microwave power device manufacturers now have the option to use the highly reliable PF018 package as an alternative to low temperature plastic packages.

The PF018 is part of a line of CuPacks that are available in a variety of standard and custom package outlines, with unsurpassed power density from 10 watts to 25 watts dissipation. These packages give microwave power device manufacturers a high reliability, low cost option to plastic packages. The PF018 is built with industry proven high temperature metal to ceramic technology.

PACKAGE BENEFITS

- Maximum allowable junction temperatures (Tj) up to 200°C
- Die attach pad can be electrically isolated from ground
- Custom RF design available

MEDIUM POWER APPLICATIONS

- Silicon Bipolar
- Silicon VMOS
- SiC devices

STANDARD PRODUCT SPECIFICATIONS

Materials:	Lead Frame: Copper
	Flange/Back-pad: Copper
	Insulating Layer: Alumina
Plating:	Electrolytic nickel thickness is 100 – 250 µin (2.54 – 6.35 µm)
	Gold thickness is up to 150 µin (3.81 µm)

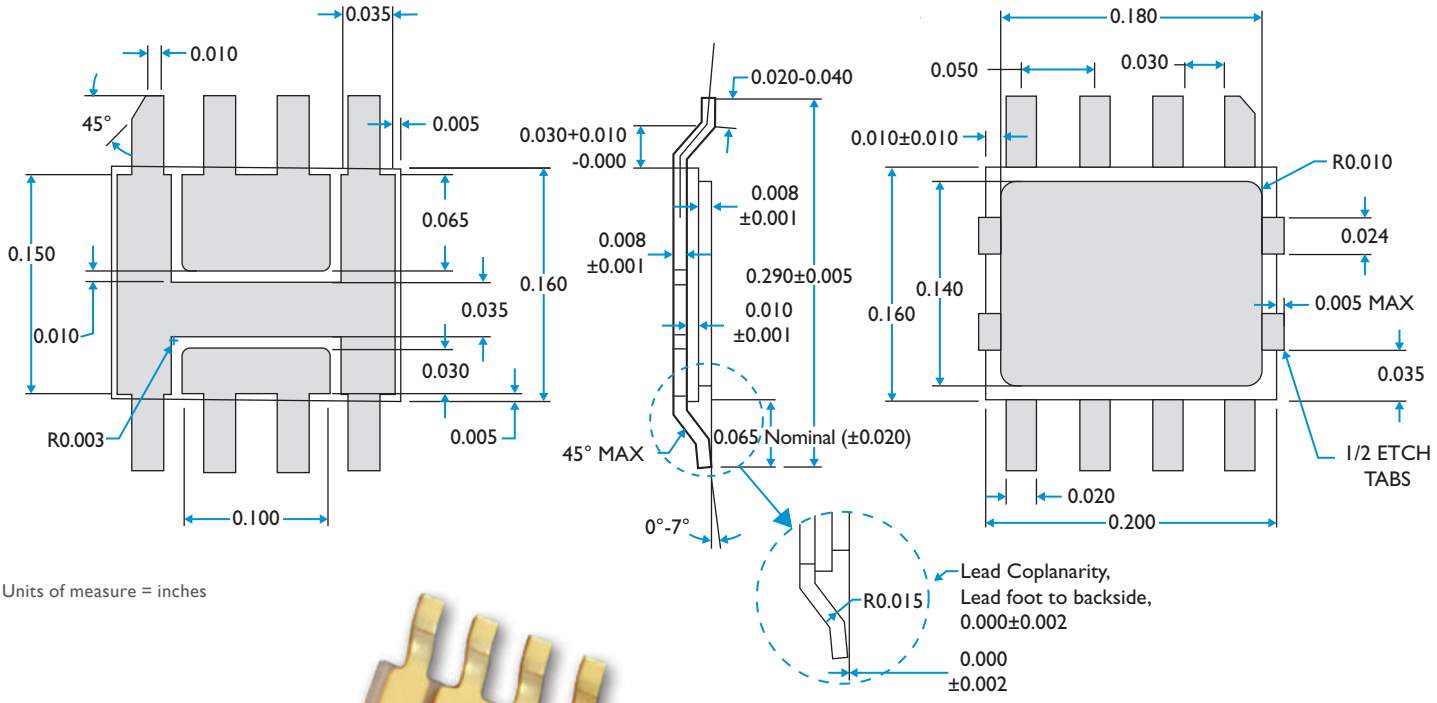
Package	
Maximum Power Dissipation	25 W
Flange/Back-pad Thickness	0.008*
Die-attach Dimension (side to side)	0.100*
Die-attach Dimension (input to output)	0.065*
Package Type	Pill
Number of Leads	8
Maximum Assembly Temperature Range	450°C
Isolated/Non-Isolated	Isolated
Lead Style	Straight or Gull wing

* Units in inches

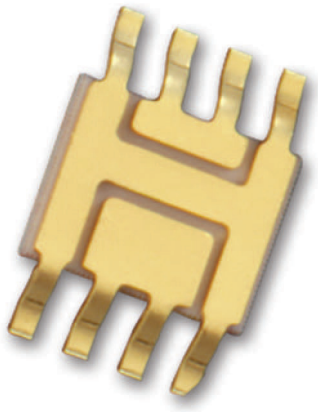
KEY PRODUCT CHARACTERISTICS

Post-Plated Key Product Characteristic	Typical
Wire Bond Pull	16.56 g
Die Shear	2.71 kg
Surface Roughness	0.13 µm
Lead Peel	3.33 lbs
Isolation Resistance @ 100 VDC+0.2KVDC @0.02mA; dwell time: 3 sec	< 10 µamps

Metric Conversion Chart (Inch to Millimeter)		
0.001 = 0.025	0.0020 = 0.508	0.065 = 1.651
0.002 = 0.051	0.024 = 0.610	0.100 = 2.540
0.003 = 0.076	0.029 = 0.737	0.150 = 3.810
0.005 = 0.127	0.030 = 0.762	0.140 = 3.556
0.008 = 2.030	0.035 = 0.889	0.160 = 4.064
0.010 = 0.254	0.040 = 1.016	0.180 = 4.572
0.0015 = 0.381	0.050 = 1.270	0.200 = 5.080



Units of measure = inches



PF024

The PF024 offers the optimum combination of performance, reliability, and assembly costs. The shallow .010 in. cavity of this package allows for optimum wire bond lengths accommodating high frequency power applications. Microwave power device manufacturers have the option to use the highly reliable PF024 package as an alternative to low temperature plastic packages.

The PF024 is part of a line of CuPacks that are available in a variety of standard and custom package outlines, with unsurpassed power density from 10 watts to 60 watts dissipation. The PF024 is built with industry proven high temperature metal to ceramic technology.

PACKAGE BENEFITS

- Maximum allowable junction temperatures (Tj) up to 200°C
- Low loss at mmWave frequencies
- Custom RF design available

MEDIUM POWER APPLICATIONS

- GaAs MMIC
- GaN MMIC

STANDARD PRODUCT SPECIFICATIONS

Materials:	Lead Frame: Copper
	Flange/Back-pad: Copper
	Insulating Layer: Alumina
Plating:	Electrolytic nickel thickness is 100 – 250 µin (2.54 – 6.35 µm)
	Gold thickness is up to 150 µin (3.81 µm)

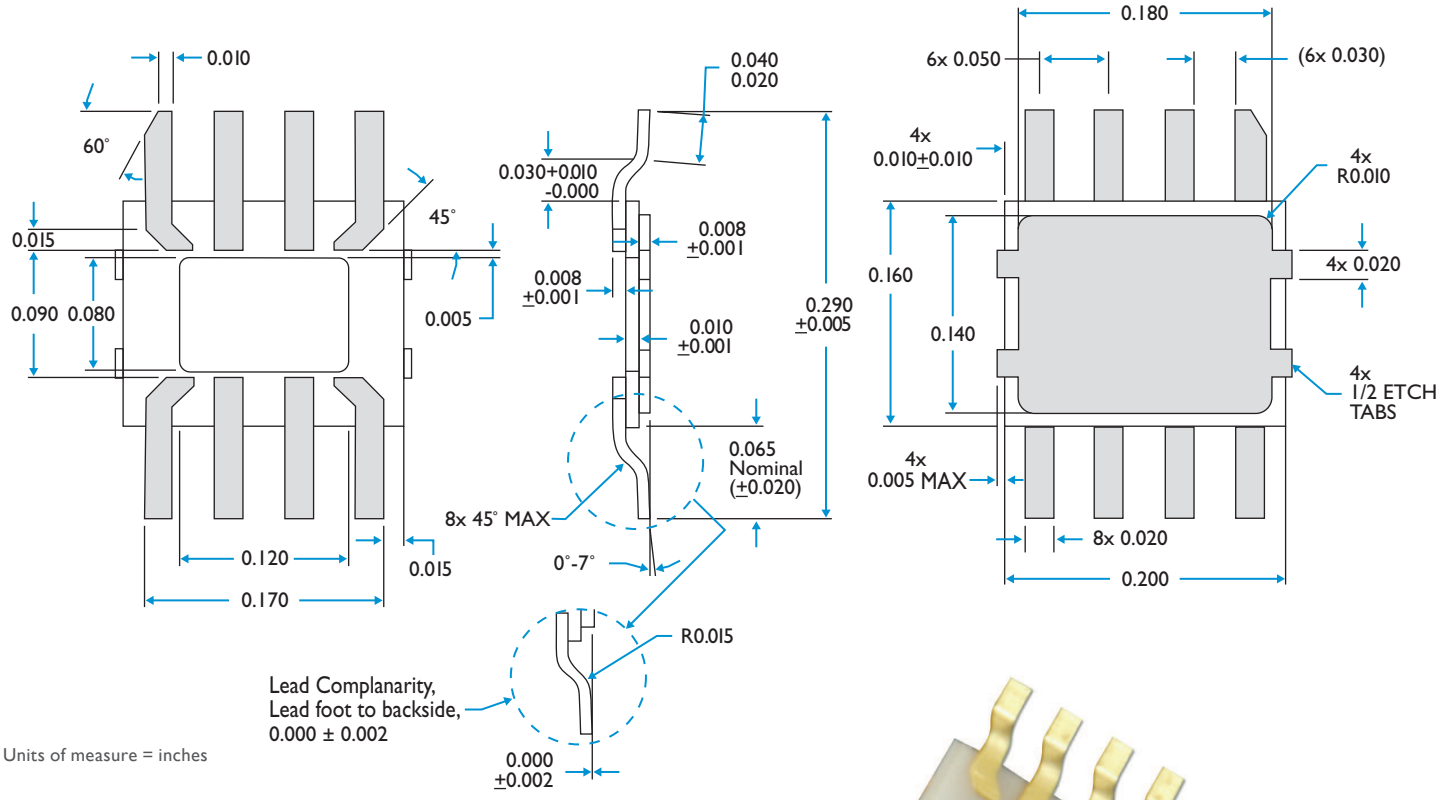
Package	
Maximum Power Dissipation	60 W
Maximum Frequency	10 GHz
Typical Effective Thermal Conductivity	393 W/mK
Lead Height	0.018*
Flange/Back-pad Thickness	0.008*
Die-attach Dimension (side to side)	0.120*
Die-attach Dimension (input to output)	0.080*
Window-frame Thickness	0.010*
Package Type	Pill
Number of Leads	8
Maximum Assembly Temperature Range	450°C
Isolated/Non-Isolated	Non-Isolated
Automation Form Factor	Strip
Lead Style	Gull wing

* Units in inches

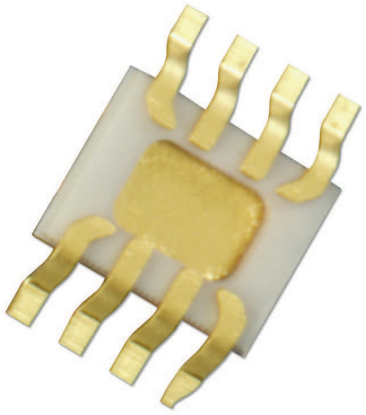
KEY PRODUCT CHARACTERISTICS

Post-Plated Key Product Characteristic	Typical
Wire Bond Pull	9.95 g
Die Shear	1.92 kg
Surface Roughness	0.582 m
Lead Peel	1.5 lbs
Isolation Resistance @ 100 VDC+0.2KVDC @0.02mA; dwell time: 3 sec	< 10 µamps

Metric Conversion Chart (Inch to Millimeter)		
0.001 = 0.025	0.030 = 0.762	0.140 = 3.556
0.002 = 0.051	0.040 = 1.016	0.160 = 4.064
0.005 = 0.127	0.050 = 1.270	0.170 = 4.318
0.008 = 2.030	0.065 = 1.651	0.180 = 4.572
0.010 = 0.254	0.080 = 2.032	0.200 = 5.080
0.015 = 0.381	0.090 = 2.286	0.290 = 7.370
0.020 = 0.508	0.120 = 3.048	



Units of measure = inches



PF083

The PF083 offers the optimum combination of performance, reliability, and assembly costs. Microwave power device manufacturers have the option to use the highly reliable PF083 package as an alternative to low temperature plastic packages.

The PF083 is part of a line of CuPacks that are available in a variety of standard and custom package outlines, with unsurpassed power density from 10 watts to 250 watts dissipation. These packages give microwave power device manufacturers a high reliability, low cost alternative to plastic packages. The PF083 is built with industry proven high temperature metal to ceramic technology.

PACKAGE BENEFITS

- Very low thermal resistance
- Maximum allowable junction temperatures (Tj) up to 200°C
- Air cavity ceramic package
- Copper flange
- Custom RF design available

MEDIUM POWER APPLICATIONS

- Si LDMOS
- GaN FET

STANDARD PRODUCT SPECIFICATIONS

Materials:	Lead Frame: Copper
	Flange/Back-pad: Copper
	Insulating Layer: Alumina
Plating:	Electrolytic nickel thickness is 100 – 250 µin (2.54 – 6.35 µm) Gold thickness is up to 150 µin (3.81 µm)

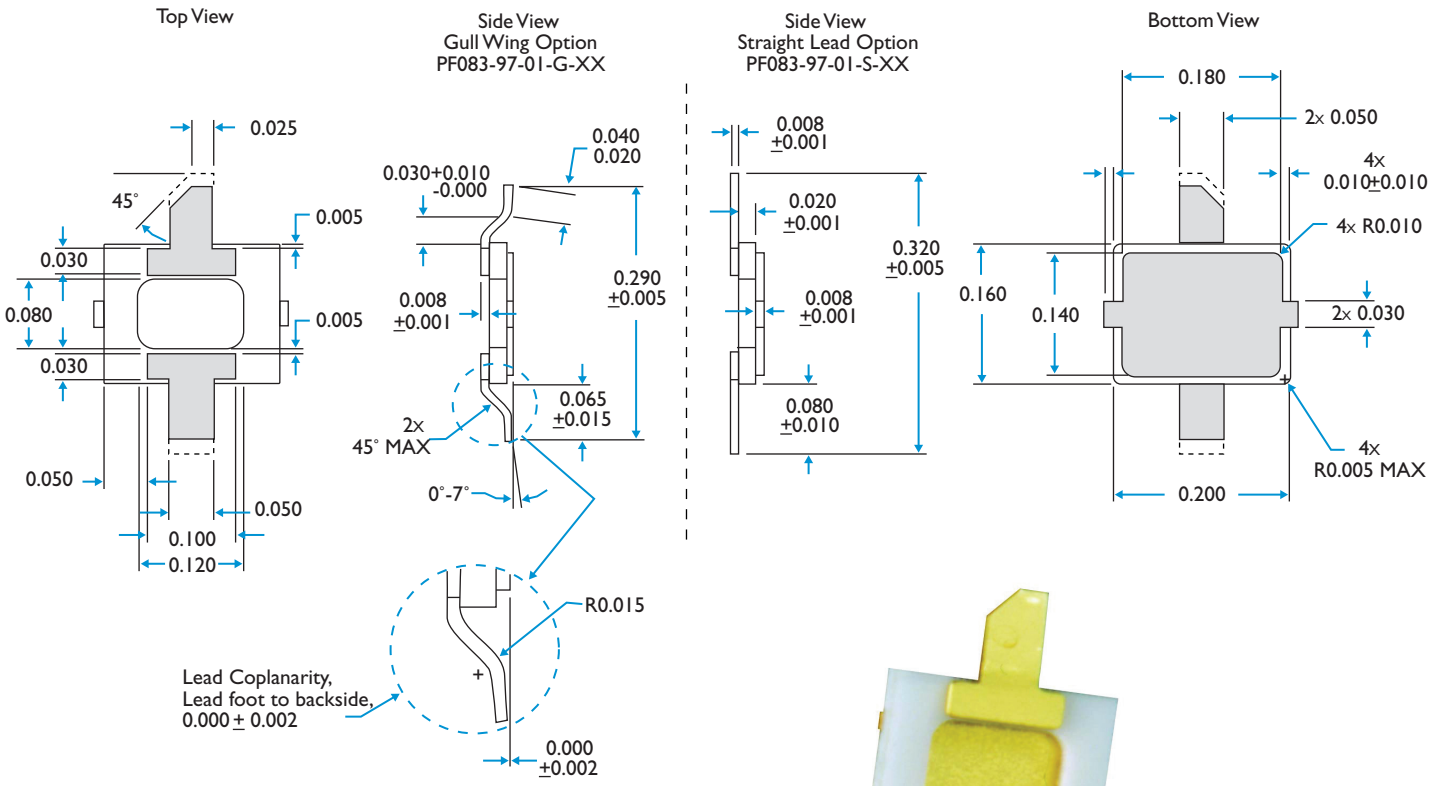
Package	
Maximum Power Dissipation	60 W
Typical Effective Thermal Conductivity	393 W/mK
Lead Height	0.028*
Flange/Back-pad Thickness	0.008*
Die-attach Dimension (side to side)	0.120*
Die-attach Dimension (input to output)	0.080*
Window-frame Thickness	0.020*
Package Type	Pill
Number of Leads	2
Maximum Assembly Temperature Range	450°C
Isolated/Non-Isolated	Non-Isolated
Lead Style	Gull Wing or Straight lead

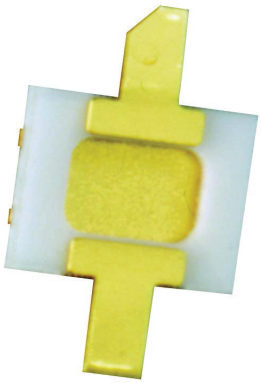
* Units in inches

KEY PRODUCT CHARACTERISTICS

Post-Plated Key Product Characteristic	Typical
Wire Bond Pull	10.54 g
Die Shear	2.25 kg
Surface Roughness	0.603 µm
Lead Peel	3.99 lbs
Isolation Resistance @ 100 VDC+0.2KVDC @0.02mA; dwell time: 3 sec	< 10 µamps

Metric Conversion Chart (Inch to Millimeter)		
0.001 = 0.025	0.025 = 0.635	0.120 = 3.048
0.002 = 0.051	0.030 = 0.762	0.140 = 3.556
0.005 = 0.127	0.040 = 1.016	0.160 = 4.064
0.008 = 2.030	0.050 = 1.270	0.180 = 4.572
0.010 = 0.254	0.065 = 1.651	0.200 = 5.080
0.015 = 0.381	0.080 = 2.032	0.290 = 7.370
0.020 = 0.508	0.100 = 2.540	0.320 = 8.128





Units of measure = inches

PF130

The PF130 offers the optimum combination of performance, reliability, and assembly costs. Microwave power device manufacturers have the option to use the highly reliable PF130 package as an alternative to low temperature plastic packages.

The PF130 is part of a line of CuPacks that are available in a variety of standard and custom package outlines, with unsurpassed power density from 10 watts to 250 watts dissipation. These packages give microwave power device manufacturers a high reliability, low cost alternative to plastic packages. The PF130 is built with industry proven high temperature metal to ceramic technology.

PACKAGE BENEFITS

- Very low thermal resistance
- Maximum allowable junction temperatures (Tj) up to 200°C
- Air cavity ceramic package
- Copper flange
- Custom RF design available

MEDIUM POWER APPLICATIONS

- Si LDMOS
- GaN n

STANDARD PRODUCT SPECIFICATIONS

Materials:	Lead Frame: Copper
	Flange/Back-pad: Copper
	Insulating Layer: Alumina
Plating:	Electrolytic nickel thickness is 100 – 250 µin (2.54 – 6.35 µm) Gold thickness is up to 150 µin (3.81 µm)

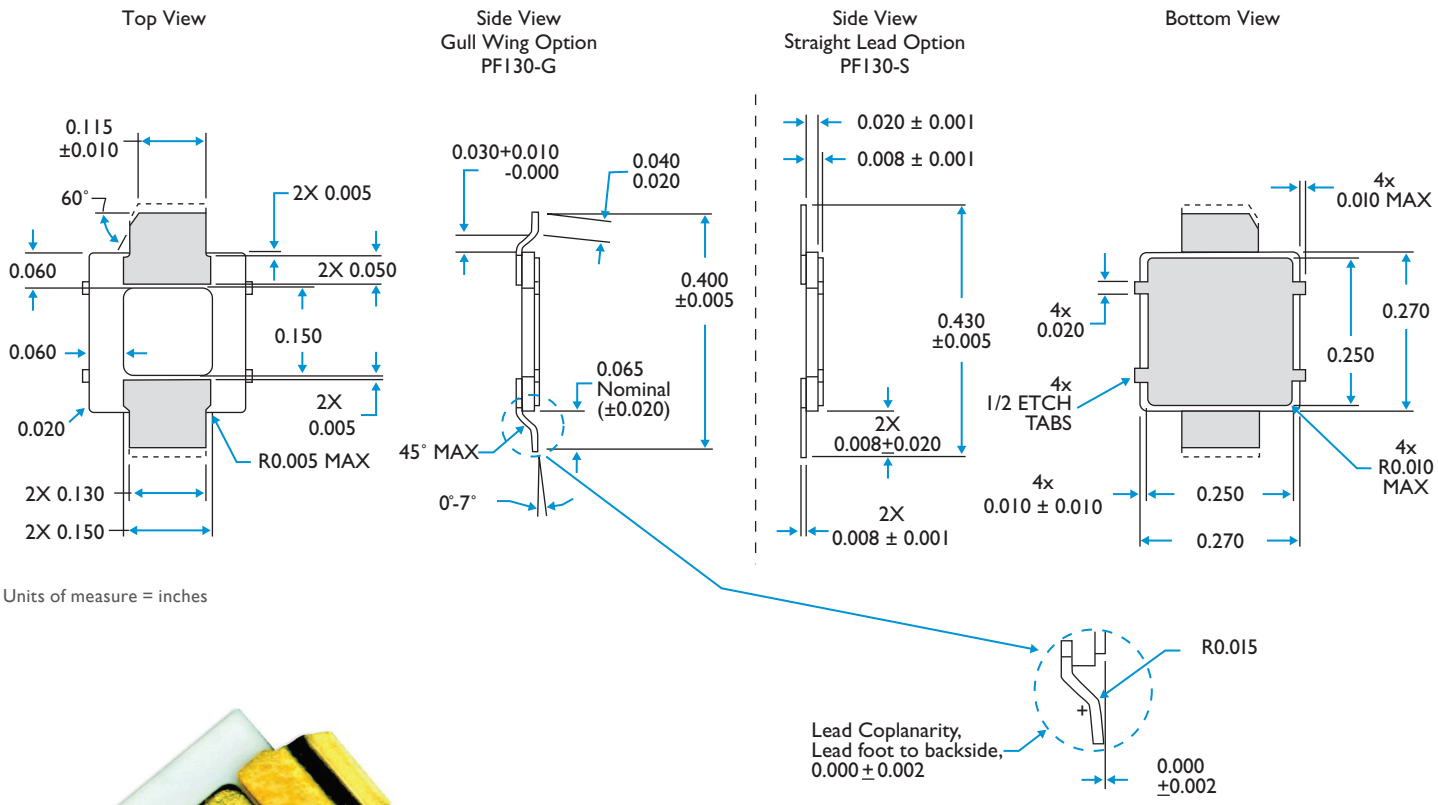
Package	
Maximum Power Dissipation	75 W
Typical Effective Thermal Conductivity	393 W/mK
Lead Height	0.028*
Flange/Back-pad Thickness	0.008*
Die-attach Dimension (side to side)	0.150*
Die-attach Dimension (input to output)	0.150*
Window-frame Thickness	0.020*
Package Type	Pill
Number of Leads	2
Maximum Assembly Temperature Range	450°C
Isolated/Non-Isolated	Non-Isolated
Lead Style	Gull wing or Straight lead

* Units in inches

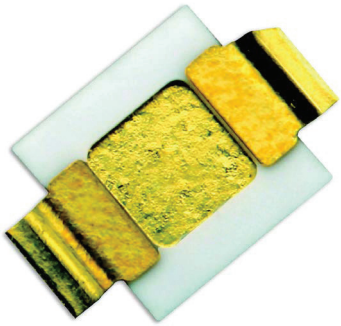
KEY PRODUCT CHARACTERISTICS

Post-Plated Key Product Characteristic	Typical
Wire Bond Pull	3.72 g
Die Shear	4.79 kg
Surface Roughness	0.198 µm
Lead Peel	4.86 lbs
Isolation Resistance @ 100 VDC+0.2KVDC @0.02mA; dwell time: 3 sec	< 10 µamps

Metric Conversion Chart (Inch to Millimeter)		
0.001 = 0.025	0.030 = 0.762	0.130 = 3.302
0.002 = 0.051	0.040 = 1.016	0.150 = 3.810
0.005 = 0.127	0.050 = 1.270	0.250 = 6.350
0.008 = 2.030	0.060 = 1.524	0.270 = 6.858
0.010 = 0.254	0.065 = 1.651	0.400 = 10.160
0.015 = 0.381	0.080 = 2.032	0.430 = 10.922
0.020 = 0.508	0.115 = 2.921	



Units of measure = inches



HIGH POWER RF PACKAGE

UP501

UP501 is a high performance metal/ceramic package for use in RF and microwave power semiconductor devices. This package exceeds industry standards for thermal dissipation for higher power devices. The enhanced mechanical rigidity and high thermal conductivity provided by the UP501, makes it an ideal platform for next generation, high power GaAs, GaN, SiC, SiGe, and Si devices.

PACKAGE BENEFITS

- High thermal conductivity copper laminant flange
- Designed for next generation, high power, RF & microwave devices
- Proven reliability
- Custom RF design available

STANDARD PRODUCT SPECIFICATIONS

Materials:	Lead Frame: Alloy 42
	Flange/Back-pad: Cu / Mo / Cu
	Insulating Layer: Alumina
Plating:	Electrolytic nickel thickness is 100 – 250 µin (2.54 – 6.35 µm)
	Gold thickness is up to 150 µin (3.81 µm)

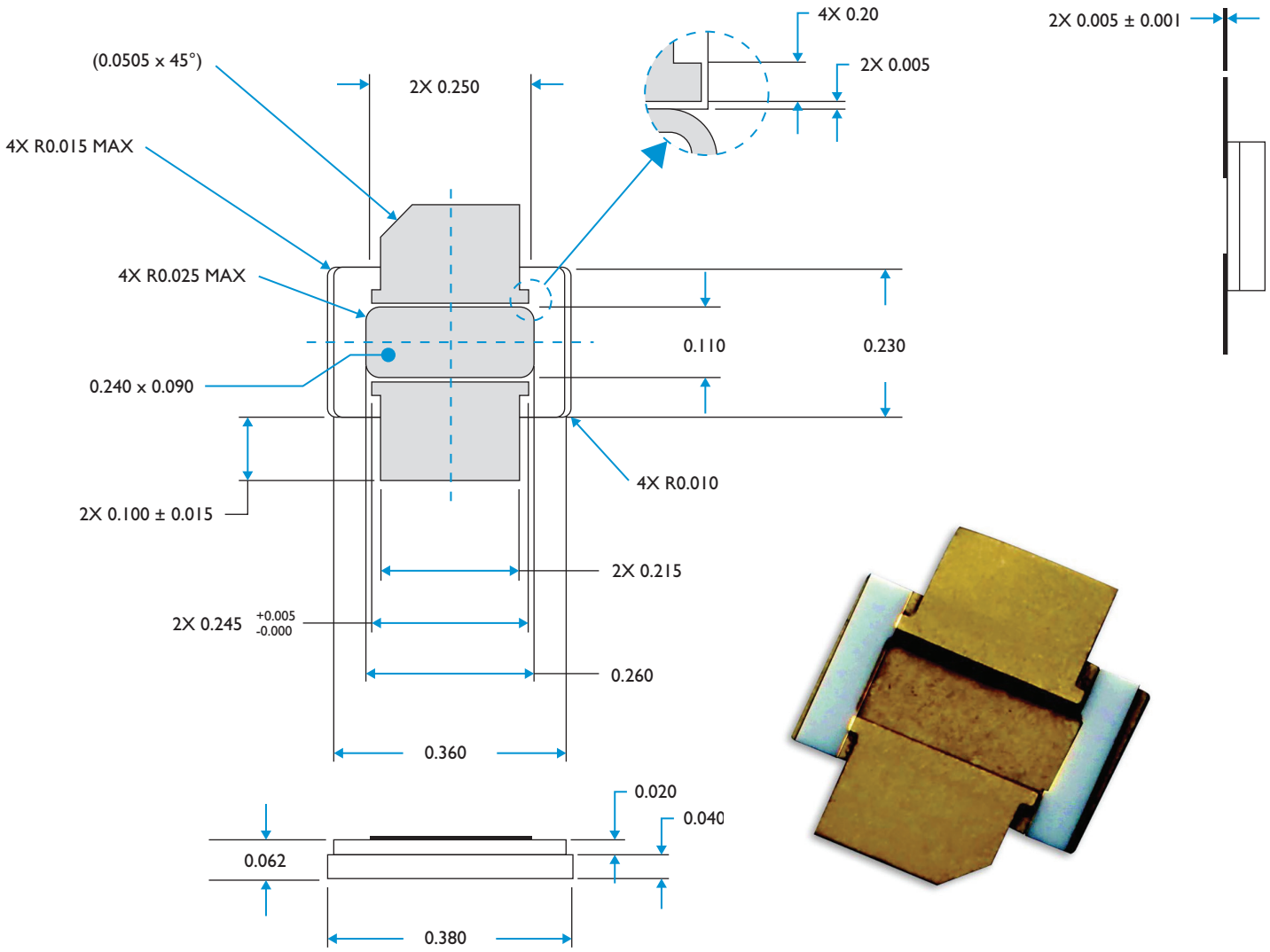
Package	
Maximum Power Dissipation	140 W
Typical Effective Thermal Conductivity	220 W/mK
Lead Height	0.060*
Flange/Back-pad Thickness	0.040*
Die-attach Dimension (side to side)	0.260*
Die-attach Dimension (input to output)	0.110*
Window-frame Thickness	0.020*
Package Type	Pill
Number of Leads	2
Maximum Assembly Temperature Range	450°C
Isolated/Non-Isolated	Non-Isolated
Lead Style	Straight lead

* Units in inches

KEY PRODUCT CHARACTERISTICS

Post-Plated Key Product Characteristic	Typical
Wire Bond Pull	14.24 g
Die Shear	3.14 kg
Surface Roughness	0.308 µm
Lead Peel	13 lbs
Isolation Resistance @ 100 VDC+0.2KVDC @0.02mA; dwell time: 3 sec	< 10 µamps

Metric Conversion Chart (Inch to Millimeter)		
0.001 = 0.025	0.090 = 2.286	0.230 = 5.842
0.005 = 0.127	0.100 = 2.540	0.240 = 6.096
0.0505 = 0.283	0.025 = 0.635	0.245 = 6.223
0.010 = 0.254	0.040 = 1.016	0.250 = 6.350
0.015 = 0.381	0.062 = 1.575	0.260 = 6.604
0.020 = 0.508	0.090 = 2.286	0.360 = 9.144
0.025 = 0.635	0.100 = 2.540	0.380 = 9.652
0.040 = 1.016	0.110 = 2.794	
0.062 = 1.575	0.215 = 5.461	



Units of measure = inches

HIGH POWER RF PACKAGE

UP504

UP504 is a high performance metal/ceramic package for use in RF and microwave power semiconductor devices. This package exceeds industry standards for thermal dissipation and is a drop-in replacement for industry specifications. The enhanced mechanical rigidity and high thermal conductivity provided by the UP504 makes it an ideal platform for next generation, high power GaAs, GaN, SiC, SiGe, and Si devices.

PACKAGE BENEFITS

- High thermal conductivity copper laminant flange
- Designed for next generation, high power RF & microwave devices
- Drop-in replacement
- Custom RF design available

STANDARD PRODUCT SPECIFICATIONS

Materials:	Lead Frame: Alloy 42
	Flange/Back-pad: CuMo/Cu
	Insulating Layer: Alumina
Plating:	Electrolytic nickel thickness is 100 – 250 µin (2.54 – 6.35 µm)
	Gold thickness is up to 150 µin (3.81 µm)

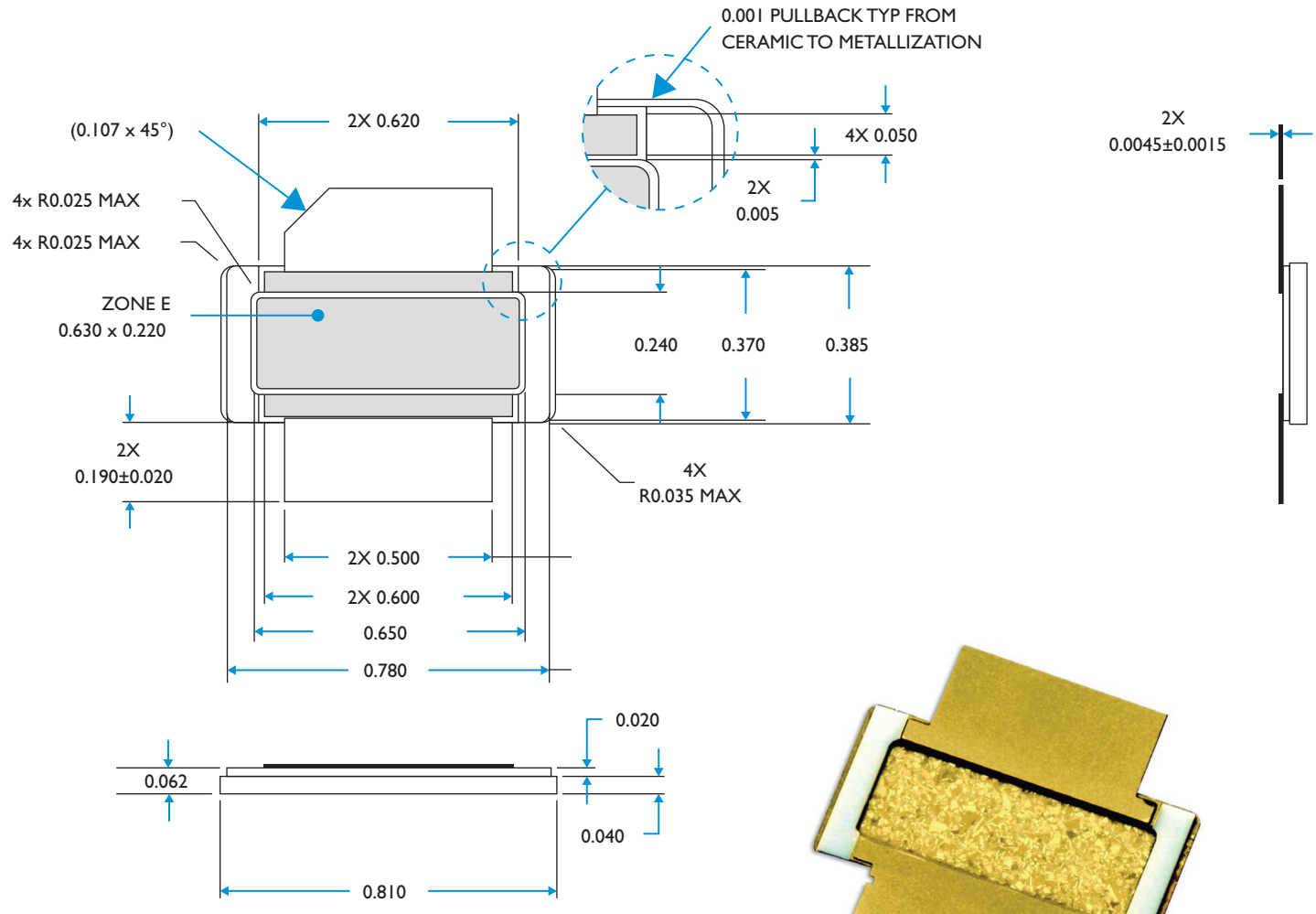
Package	
Maximum Power Dissipation	355 W
Typical Effective Thermal Conductivity	220 W/mK
Lead Height	0.060*
Flange/Back-pad Thickness	0.040*
Die-attach Dimension (side to side)	0.650*
Die-attach Dimension (input to output)	0.240*
Window-frame Thickness	0.020*
Package Type	Pill
Number of Leads	2
Maximum Assembly Temperature Range	450°C
Isolated/Non-Isolated	Non-Isolated
Lead Style	Straight lead

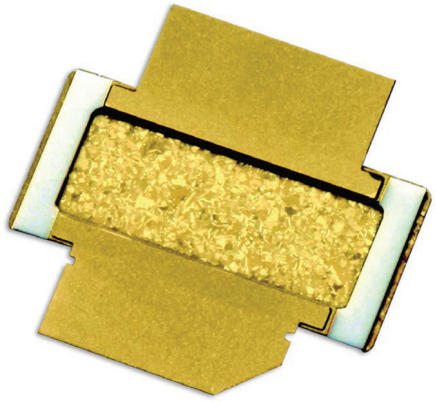
* Units in inches

KEY PRODUCT CHARACTERISTICS

Post-Plated Key Product Characteristic	Typical
Wire Bond Pull	10.15 g
Die Shear	3.56 kg
Surface Roughness	0.306 µm
Lead Peel	8 lbs
Isolation Resistance @ 100 VDC+0.2KVDC @0.02mA; dwell time: 3 sec	< 10 µamps

Metric Conversion Chart (Inch to Millimeter)		
0.001 = 0.025	0.050 = 1.270	0.500 = 12.700
0.0015 = 0.038	0.062 = 1.575	0.600 = 15.240
0.0045 = 0.114	0.107 = 2.718	0.620 = 15.748
0.005 = 0.127	0.190 = 4.826	0.630 = 16.002
0.020 = 0.508	0.220 = 5.588	0.650 = 16.510
0.025 = 0.635	0.240 = 6.096	0.780 = 19.812
0.035 = 0.889	0.370 = 9.398	0.810 = 20.574
0.040 = 1.016	0.385 = 9.779	





Units of measure = inches

NOTES

NOTES

FOR MORE PRODUCT INFORMATION AND TO REQUEST A QUOTE, VISIT MATERION.COM

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