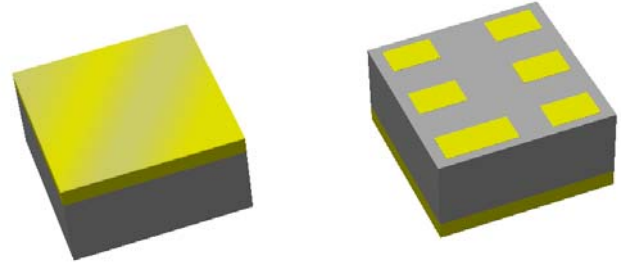


# Data Sheet

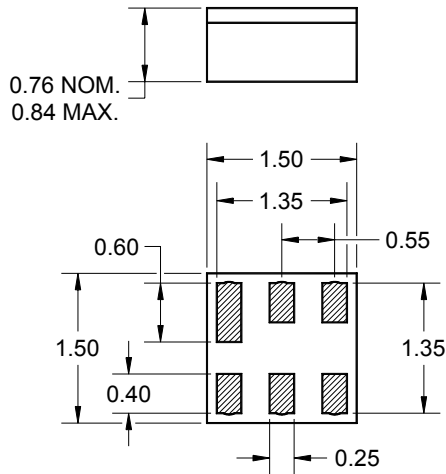
## Features

- For GSM-1900 applications
- Usable bandwidth of 60 MHz
- Compatible with leading chipset suppliers
- Ultra low loss
- Single-ended input, 50Ω
- Balanced output, 200Ω
- Chip Scale Package (CSP)
- Hermetic



## Package

Surface Mount 1.50 x 1.50 x 0.76 mm

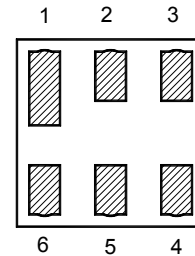


Dimensions shown are nominal in millimeters  
 All tolerances are  $\pm 0.10\text{mm}$

Body:  $\text{Al}_2\text{O}_3$  ceramic  
 Lid: Kovar or Alloy 42, Au over Ni plated  
 Terminations: Au plating 0.5 - 1.0 $\mu\text{m}$ ,  
 over a 2 - 6 $\mu\text{m}$  Ni plating

## Pin Configuration

Bottom View



Pin No.	Description
2	Input
4,6	Output
1,3,5	Case ground

# Data Sheet

## Electrical Specifications <sup>(1)</sup>

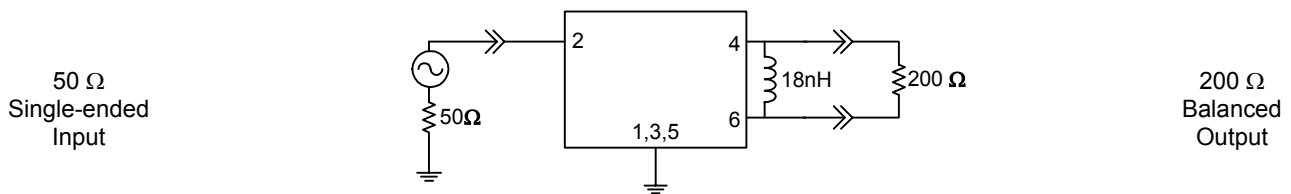
Operating Temperature Range: <sup>(2)</sup> +25 °C

Parameter <sup>(3)</sup>	Minimum	Typical	Maximum	Unit
<b>Center Frequency</b>	-	1960	-	MHz
<b>Maximum Insertion Loss</b> 1930 - 1990 MHz	-	1.5	2.1	dB
<b>Absolute Attenuation</b>				
100 - 1830 MHz	25	35	-	dB
1830 - 1902 MHz	10	17	-	dB
1902 - 1910 MHz	7	10	-	dB
2010 - 2030 MHz	5	6.5	-	dB
2030 - 2070 MHz	10	15	-	dB
2070 - 3000 MHz	16	18	-	dB
3000 - 5790 MHz	30	40	-	dB
5790 - 6000 MHz	35	40	-	dB
<b>Output Amplitude Balance (<math> S_{31}/S_{21} </math>)</b> 1930 - 1990 MHz	-1.5	1.3	1.5	dB
<b>Output Phase Balance [<math>\Phi(S_{31})-\Phi S_{21}+180</math>]</b> 1930 - 1990 MHz	-10	2	10	degree
<b>Input/Output VSWR</b> 1930 - 1990 MHz	-	2.0	2.5	-
<b>Source Impedance <sup>(4)</sup></b>	-	50	-	$\Omega$
<b>Load Impedance (Balanced) <sup>(4)</sup></b>	-	200  18nH	-	$\Omega$

### Notes:

1. All specifications are based on the test circuit shown below
2. In production, devices will be tested at room temperature to a guardbanded specification to ensure electrical compliance over temperature
3. Electrical margin has been built into the design to account for the variations due to temperature drift and manufacturing tolerances
4. This is the optimum impedance in order to achieve the performance shown

### Test Circuit:



# Data Sheet

## Electrical Specifications <sup>(1)</sup>

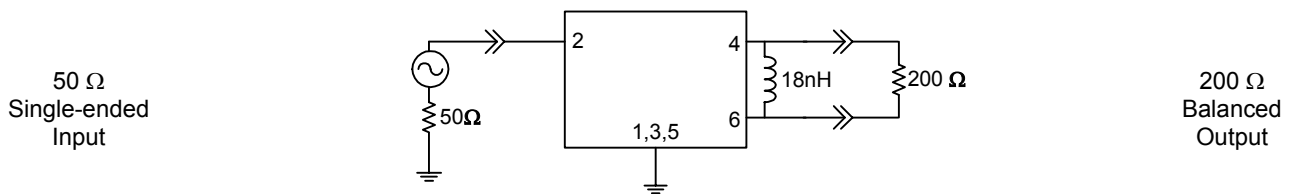
Operating Temperature Range: <sup>(2)</sup> -10 to +80 °C

Parameter <sup>(3)</sup>	Minimum	Typical	Maximum	Unit
<b>Center Frequency</b>	-	1960	-	MHz
<b>Maximum Insertion Loss</b> 1930 - 1990 MHz	-	1.5	2.3	dB
<b>Absolute Attenuation</b>				
100 - 1830 MHz	25	35	-	dB
1830 - 1902 MHz	10	17	-	dB
1902 - 1910 MHz	6	10	-	dB
2010 - 2030 MHz	5	6.5	-	dB
2030 - 2070 MHz	10	15	-	dB
2070 - 3000 MHz	16	18	-	dB
3000 - 5790 MHz	30	40	-	dB
5790 - 6000 MHz	35	40	-	dB
<b>Output Amplitude Balance (<math> S_{31}/S_{21} </math>)</b> 1930 - 1990 MHz	-1.5	1.3	1.5	dB
<b>Output Phase Balance [<math>\Phi(S_{31})-\Phi S_{21}+180</math>]</b> 1930 - 1990 MHz	-10	2	10	degree
<b>Input/Output VSWR</b> 1930 - 1990 MHz	-	2.0	2.5	-
<b>Source Impedance <sup>(4)</sup></b>	-	50	-	$\Omega$
<b>Load Impedance (Balanced) <sup>(4)</sup></b>	-	200  18nH	-	$\Omega$

### Notes:

1. All specifications are based on the test circuit shown below
2. In production, devices will be tested at room temperature to a guardbanded specification to ensure electrical compliance over temperature
3. Electrical margin has been built into the design to account for the variations due to temperature drift and manufacturing tolerances
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### Test Circuit:



**Data Sheet**

**Electrical Specifications <sup>(1)</sup>**

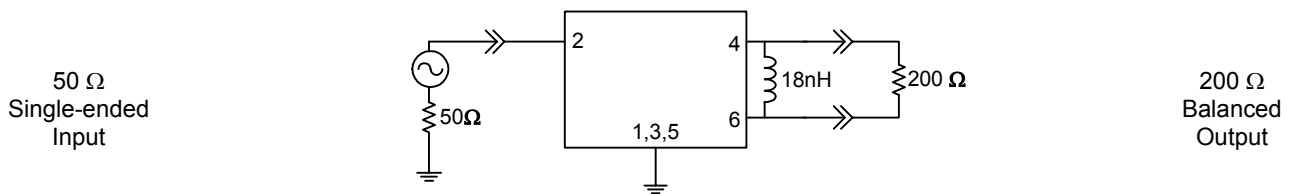
Operating Temperature Range: <sup>(2)</sup> -25 to +80 °C

Parameter <sup>(3)</sup>	Minimum	Typical	Maximum	Unit
<b>Center Frequency</b>	-	1960	-	MHz
<b>Maximum Insertion Loss</b> 1930 - 1990 MHz	-	1.5	2.5	dB
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<b>Input/Output VSWR</b> 1930 - 1990 MHz	-	2.0	2.5	-
<b>Source Impedance <sup>(4)</sup></b>	-	50	-	$\Omega$
<b>Load Impedance (Balanced) <sup>(4)</sup></b>	-	200  18nH	-	$\Omega$

**Notes:**

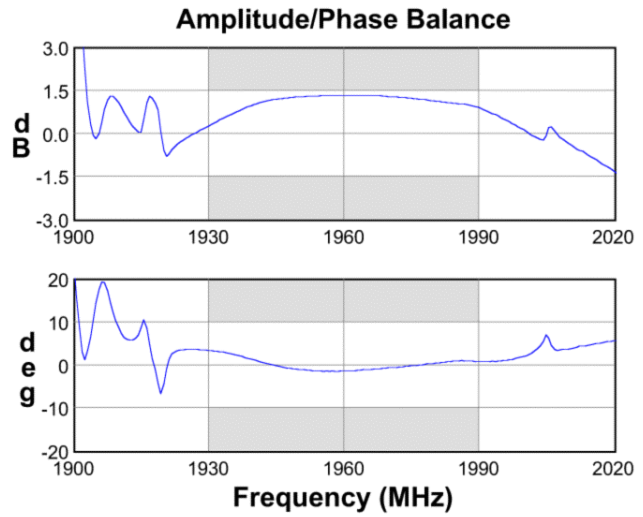
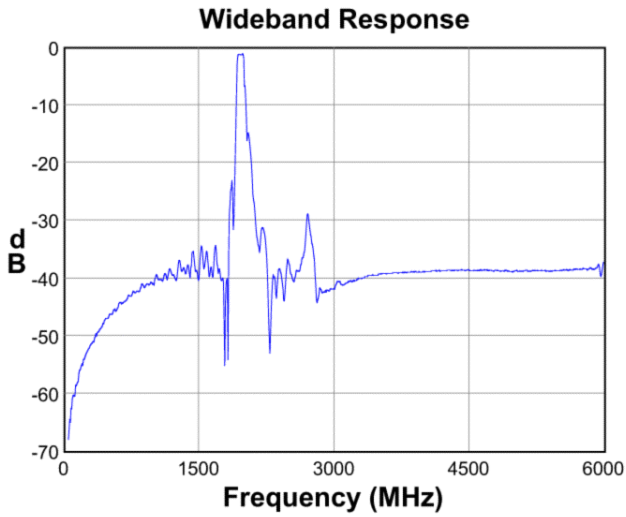
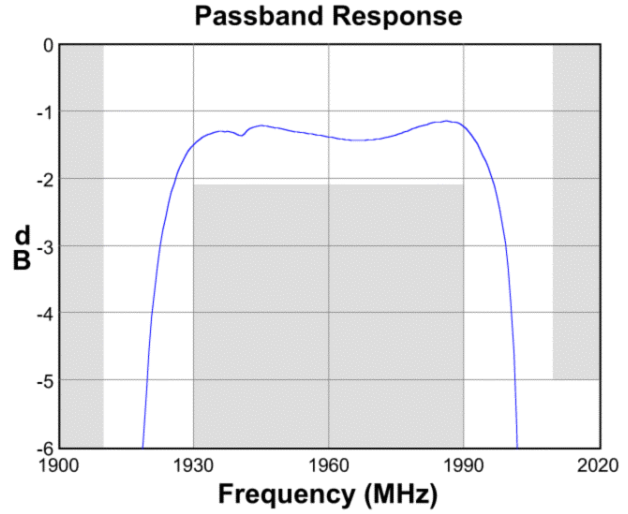
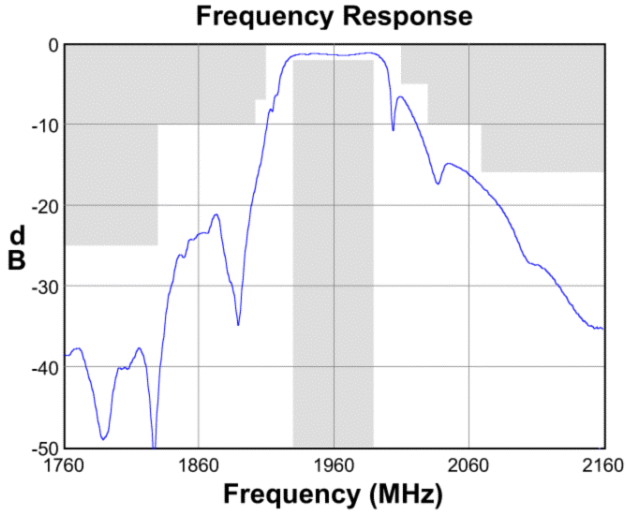
1. All specifications are based on the test circuit shown below
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**Test Circuit:**

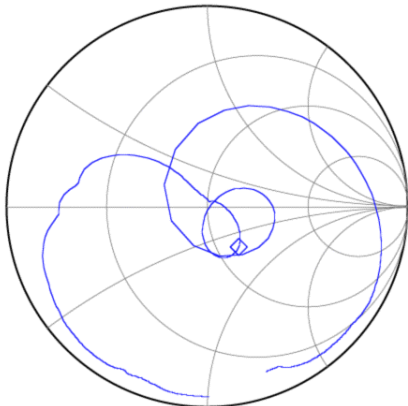


**Data Sheet**

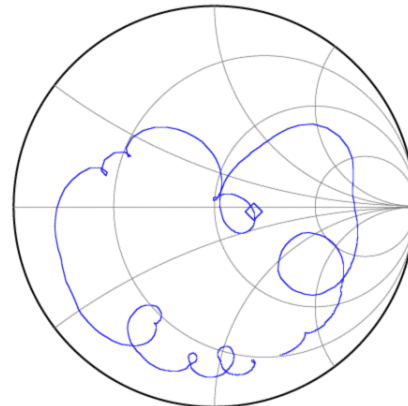
**Typical Performance (at +25°C)**



**Input Smith Chart**

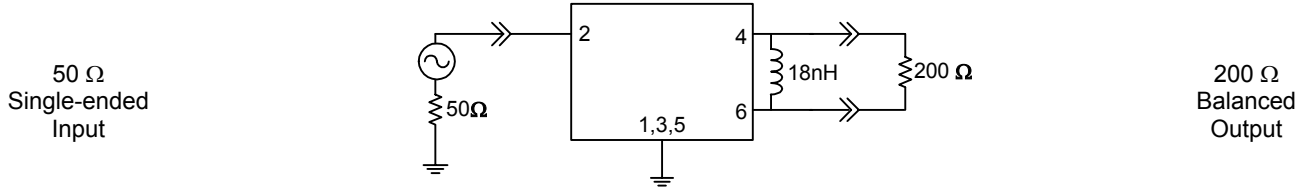


**Output Smith Chart**

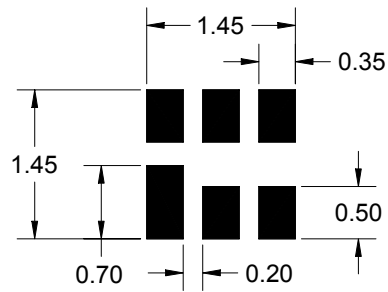
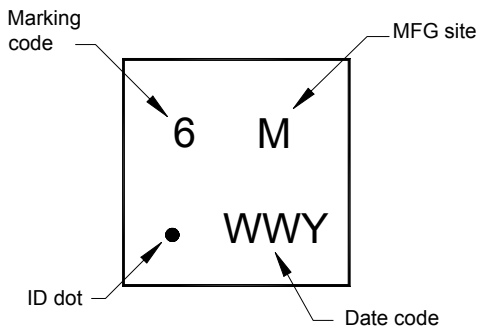


**Data Sheet**

**Matching Schematics**



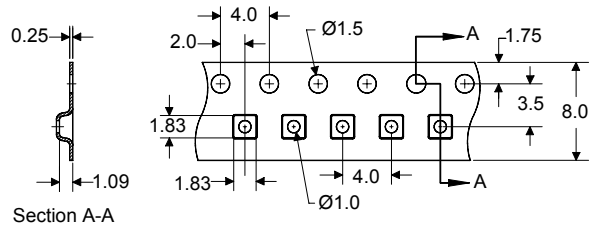
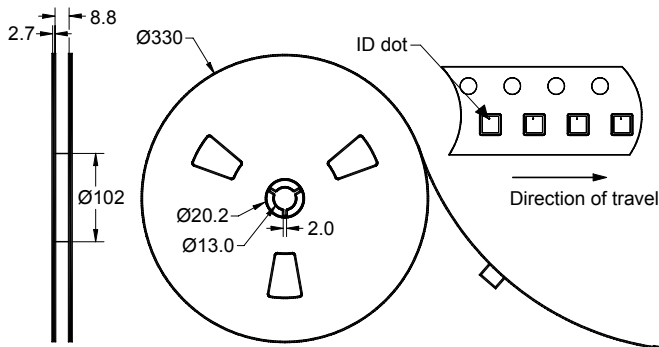
**Marking PCB Footprint**



The date code consists of: WW = 2 digit week, Y = last digit of year, M = manufacturing site code

This footprint represents a recommendation only  
Dimensions shown are nominal in millimeters

**Tape and Reel**




Dimensions shown are nominal in millimeters  
Packaging quantity: 10000 units/reel

# Data Sheet

## Maximum Ratings

Parameter	Symbol	Minimum	Maximum	Unit
Operating Temperature Range	T	-25	+80	°C
Storage Temperature Range	T <sub>stg</sub>	-40	+85	°C

### Warnings

- Electrostatic Sensitive Device (ESD) 
- Avoid ultrasonic exposure

### Material Content

- Does not contain lead (Pb) or other RoHS restricted materials

## Links to Additional Technical Information

[PCB Layout Tips](#)

[Qualification Flowchart](#)

[Soldering Profile](#)

[S-Parameters](#)

[Other Technical Information](#)

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Or contact one of our worldwide  
 Network of [sales offices](#),  
[Representatives or distributors](#)