



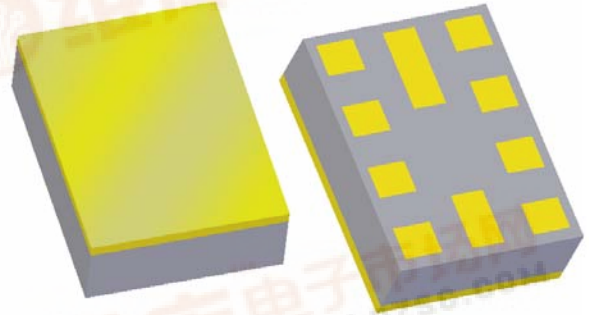
Part Number 856565

881.5/1960 MHz SAW Filter

Preliminary Data Sheet

Features

- For CDMA-ZIF Cellular/PCS applications
- Usable bandwidth 25 MHz at 881.5 MHz
- Usable bandwidth 60 MHz at 1960 MHz
- Compatible with leading chipset suppliers
- Low loss
- High attenuation
- Single-ended input, 50Ω
- Balanced output, 100Ω
- Ceramic Chip Scale Package (CSP)
- Hermetic
- RoHS compliant (2002/95/EC), Pb-free (Pb)

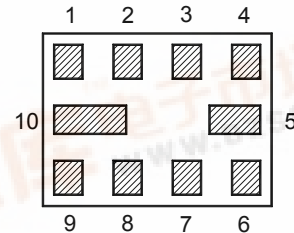
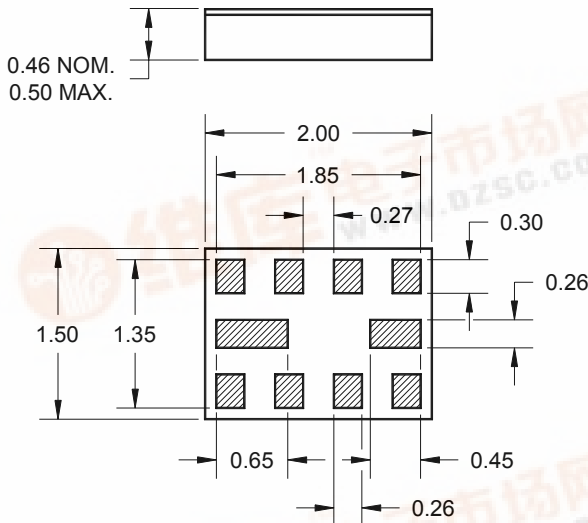


Package

Surface Mount 2.00 x 1.50 x 0.46 mm

Pin Configuration

Bottom View



Pin No.	Description
1	SE Cellular input
4	SE PCS input
6,7	Balanced PCS output
8,9	Balanced Cellular output
2,3,5,10	Case ground

Dimensions shown are nominal in millimeters
All tolerances are ±0.10mm

Body: Al₂O₃ ceramic
Lid: Kovar or Alloy 42, Au over Ni plated
Terminations: Au plating 0.5 - 1.0µm,
over a 2 - 6µm Ni plating



Preliminary Data Sheet
Electrical Cellular Specifications ⁽¹⁾
Operating Temperature Range: ⁽²⁾ +25 °C

Parameter ⁽³⁾	Minimum	Typical	Maximum	Unit
Center Frequency	-	881.5	-	MHz
Maximum Insertion Loss 869 - 894 MHz	-	1.6	2.1	dB
Absolute Attenuation				
0.2 - 760 MHz	50	58	-	dB
760 - 824 MHz	45	50	-	dB
824 - 849 MHz	35	40	-	dB
915 - 960 MHz	23	28	-	dB
960 - 3000 MHz	45	53	-	dB
Amplitude Ripple 869 - 894 MHz	-	0.3	1	dB p-p
Output Amplitude Balance (S_{31}/S_{21}) 869 - 894 MHz	-1	-0.7	1	dB
Output Phase Balance [$\phi(S_{31})-\phi(S_{21})+180$] 869 - 894 MHz	-5	-2/+2	5	degree
Input/Output VSWR 869 - 894 MHz	-	1.5	1.92	-
Optimal Source Impedance ⁽⁴⁾	-	50	-	Ω
Optimal Load Impedance (Balanced) ⁽⁴⁾	-	137+j84	-	Ω

Notes:

1. All specifications are based on the Sawtek reference test system
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

Preliminary Data Sheet

Electrical Cellular Specifications ⁽¹⁾

Operating Temperature Range: ⁽²⁾ -30 to +85 °C

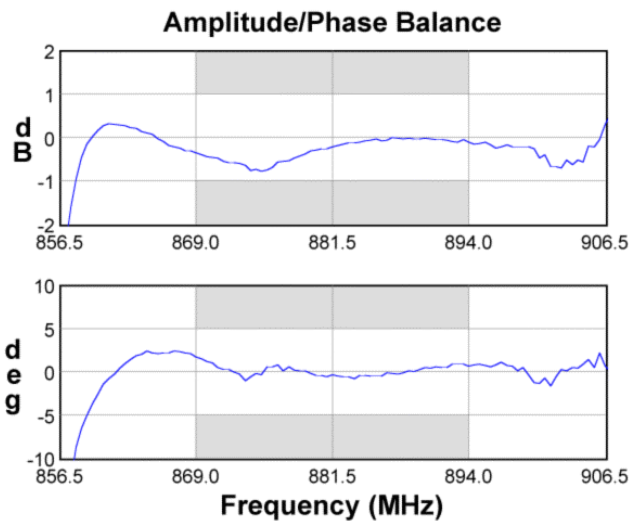
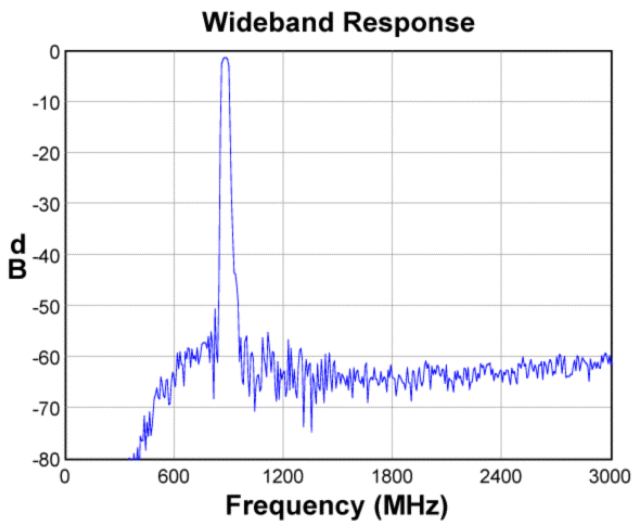
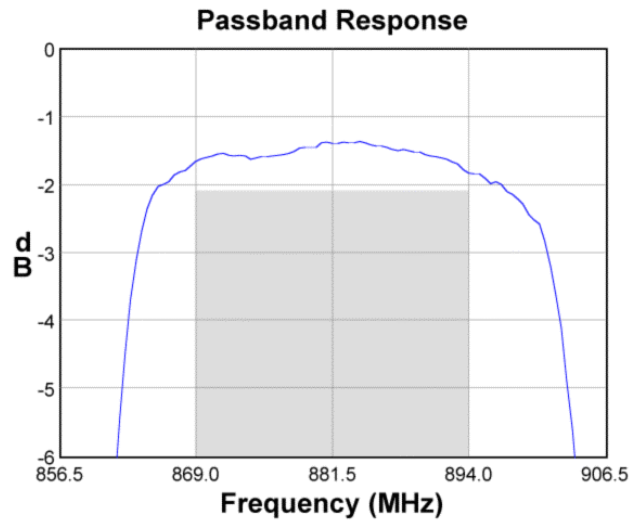
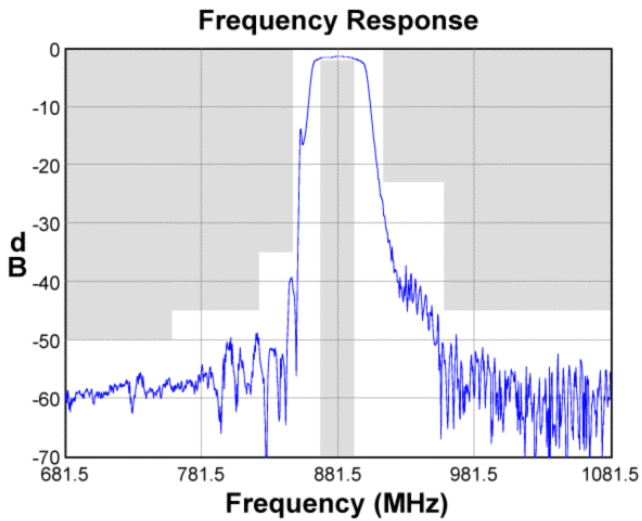
Parameter ⁽³⁾	Minimum	Typical	Maximum	Unit
Center Frequency	-	881.5	-	MHz
Maximum Insertion Loss				
869 - 894 MHz	-	1.6	2.1	dB
869 - 894 MHz (-40 to +85 °C)	-	1.6	2.8	dB
Absolute Attenuation				
0.2 - 760 MHz	50	58	-	dB
760 - 824 MHz	45	50	-	dB
824 - 849 MHz	35	40	-	dB
915 - 960 MHz	21	28	-	dB
960 - 3000 MHz	45	53	-	dB
Amplitude Ripple				
869 - 894 MHz	-	0.3	1	dB p-p
Output Amplitude Balance (S_{31}/S_{21})				
869 - 894 MHz	-1	-0.7	1	dB
Output Phase Balance [$\phi(S_{31})-\phi(S_{21})+180$]				
869 - 894 MHz	-5	-2/+2	5	degree
Input/Output VSWR				
869 - 894 MHz	-	1.5	1.92	-
Optimal Source Impedance ⁽⁴⁾	-	50	-	Ω
Optimal Load Impedance (Balanced) ⁽⁴⁾	-	137+j84	-	Ω

Notes:

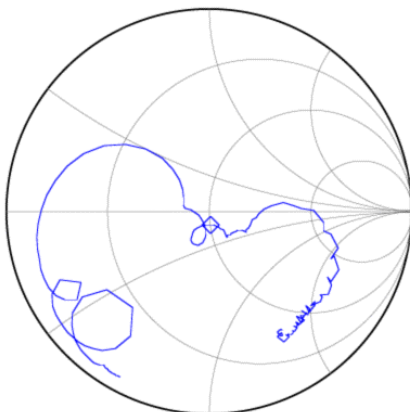
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Preliminary Data Sheet

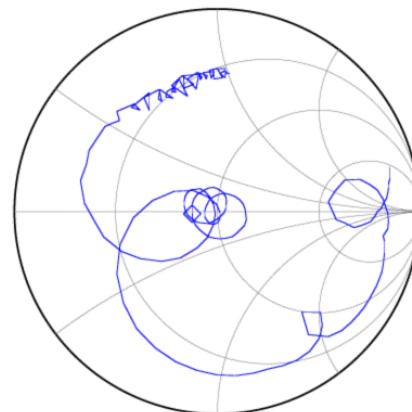
Typical Cellular Performance (at +25°C)



Input Smith Chart



Output Smith Chart



Preliminary Data Sheet

PCS Electrical Specifications ⁽¹⁾

Operating Temperature Range: ⁽²⁾ +25 °C

Parameter ⁽³⁾	Minimum	Typical	Maximum	Unit
Center Frequency	-	1960	-	MHz
Maximum Insertion Loss 1930 - 1990 MHz	-	2.2	2.6	dB
Absolute Attenuation 10 - 1850 MHz	35	38	-	dB
1850 - 1910 MHz	19	25	-	dB
2040 - 2200 MHz	25	28	-	dB
2200 - 2800 MHz	30	35	-	dB
2800 - 3400 MHz	40	45	-	dB
3400 - 6000 MHz	40	45	-	dB
Amplitude Ripple 1930 - 1990 MHz	-	0.8	2	dB p-p
Output Amplitude Balance (S_{31}/S_{21}) 1930 - 1990 MHz	-1.9	1.31	1.9	dB
Output Phase Balance [$\phi(S_{31})-\phi(S_{21})+180$] 1930 - 1990 MHz	-12	8	12	degree
Input VSWR 1930 - 1990 MHz	-	1.9	2.3	-
Output VSWR 1930 - 1990 MHz	-	1.8	2.2	-
Optimal Source Impedance ⁽⁴⁾	-	50	-	Ω
Optimal Load Impedance (Balanced) ⁽⁴⁾	-	120 + j98	-	Ω

Notes:

1. All specifications are based on the Sawtek reference test system
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

Preliminary Data Sheet

PCS Electrical Specifications ⁽¹⁾

Operating Temperature Range: ⁽²⁾ -30 to +85 °C

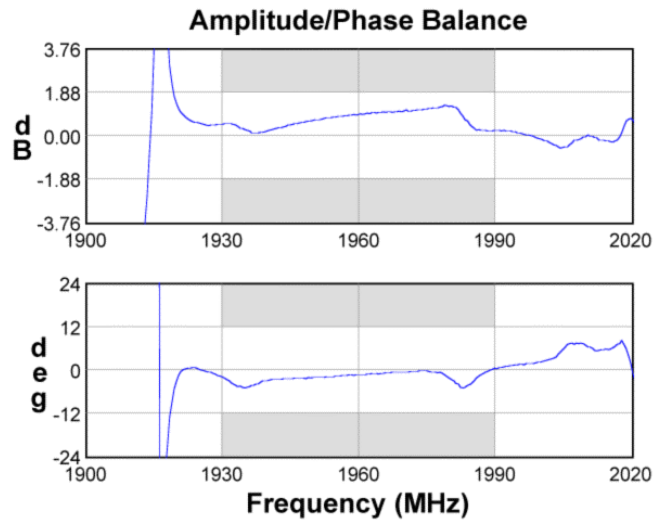
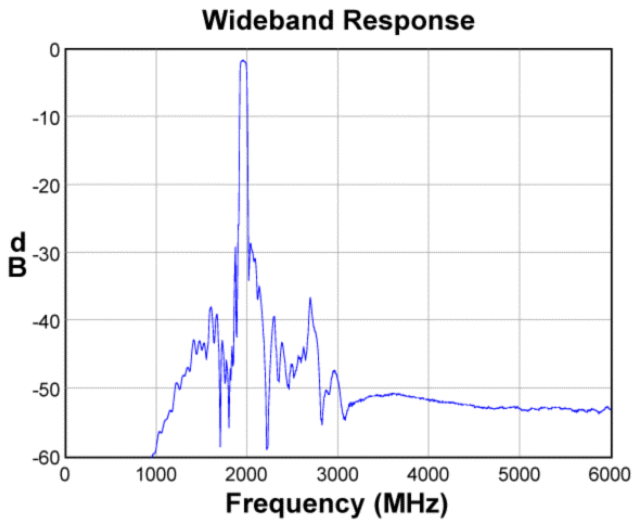
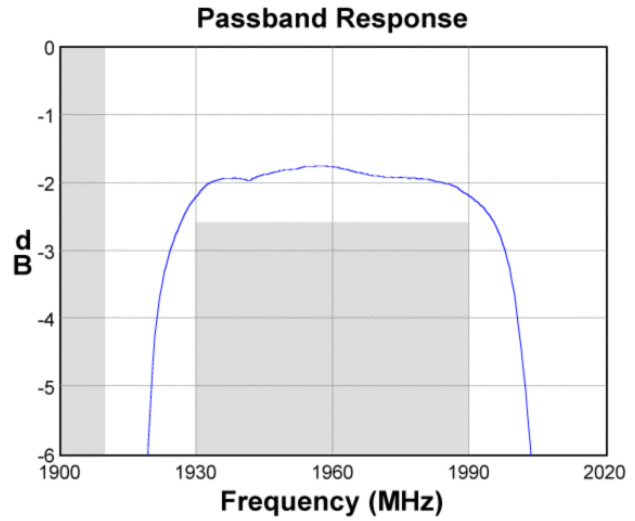
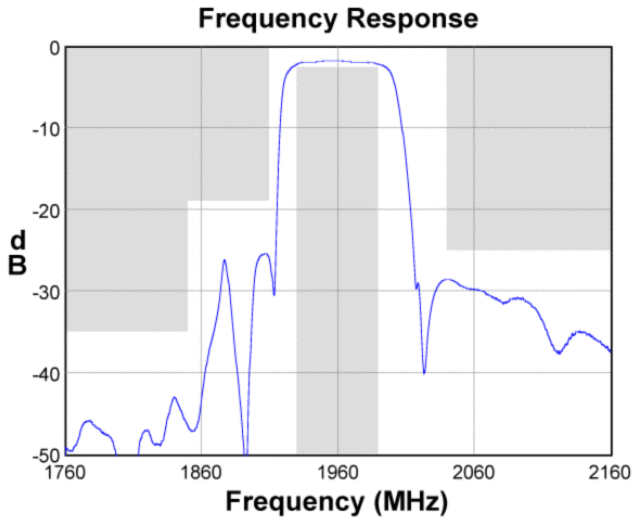
Parameter ⁽³⁾	Minimum	Typical	Maximum	Unit
Center Frequency	-	1960	-	MHz
Maximum Insertion Loss				
1930 - 1990 MHz	-	2.2	3.0	dB
1930 - 1990 MHz (-40to +85 °C)	-	2.2	4.1	dB
Absolute Attenuation				
10 - 1850 MHz	35	38	-	dB
1850 - 1910 MHz	15	25	-	dB
1850 - 1910 MHz (+15 to +65 °C)	18	25	-	dB
2040 - 2200 MHz	25	28	-	dB
2200 - 2800 MHz	30	35	-	dB
2800 - 3400 MHz	40	45	-	dB
3400 - 6000 MHz	40	45	-	dB
Amplitude Ripple				
1930 - 1990 MHz	-	0.8	2	dB p-p
Output Amplitude Balance (S₃₁/S₂₁)				
1930 - 1990 MHz	-1.9	1.31	1.9	dB
Output Phase Balance [φ(S₃₁)-φ(S₂₁)+180]				
1930 - 1990 MHz	-12	8	12	degree
Input VSWR				
1930 - 1990 MHz	-	1.9	2.3	-
Output VSWR				
1930 - 1990 MHz	-	1.8	2.2	-
Optimal Source Impedance ⁽⁴⁾	-	50	-	Ω
Optimal Load Impedance (Balanced) ⁽⁴⁾	-	120 + j98	-	Ω

Notes:

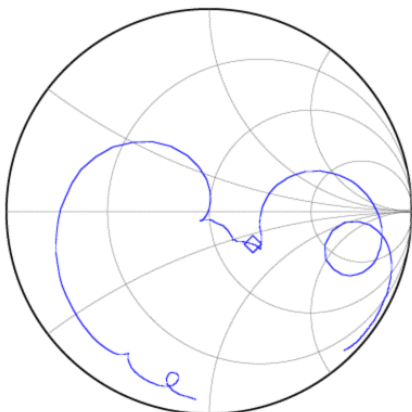
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Preliminary Data Sheet

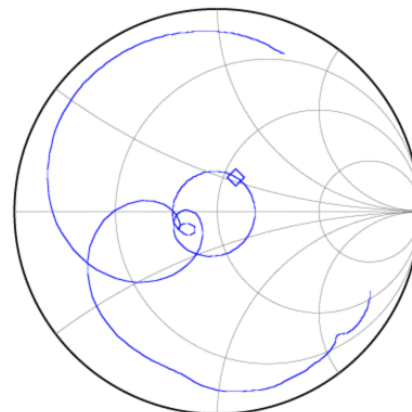
PCS Typical Performance (at +25°C)



Input Smith Chart



Output Smith Chart

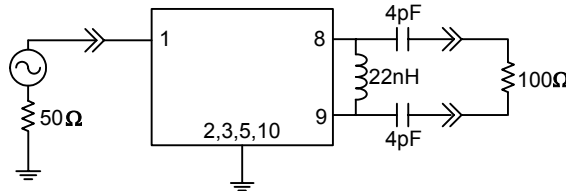


Preliminary Data Sheet

Matching Schematics

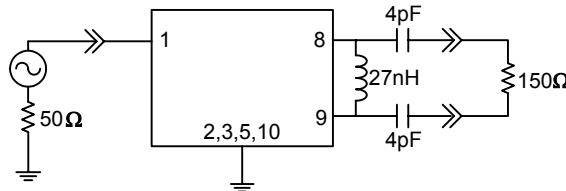
Actual matching values may vary due to PCB layout and parasitics

881.5 MHz
50 Ω
Single-ended
Input



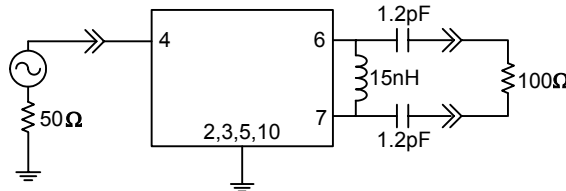
100 Ω
Balanced
Output

881.5 MHz
50 Ω
Single-ended
Input



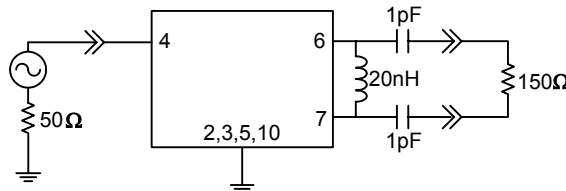
150 Ω
Balanced
Output

1960 MHz
50 Ω
Single-ended
Input



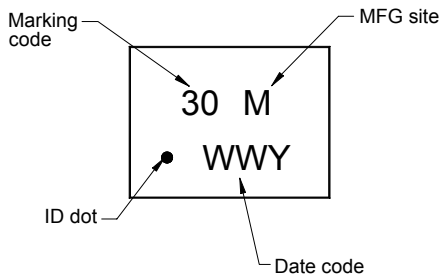
100 Ω
Balanced
Output

1960 MHz
50 Ω
Single-ended
Input



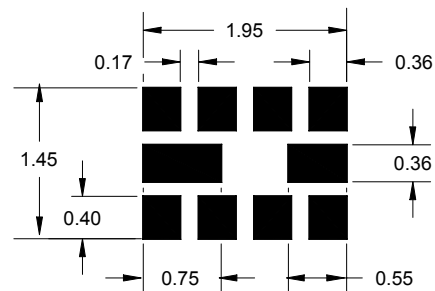
150 Ω
Balanced
Output

Marking



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

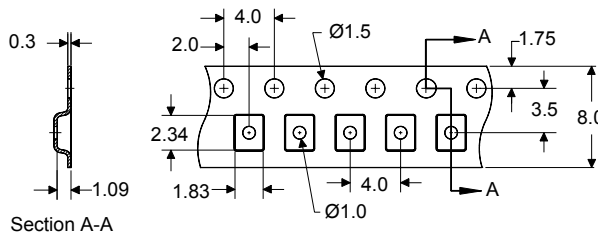
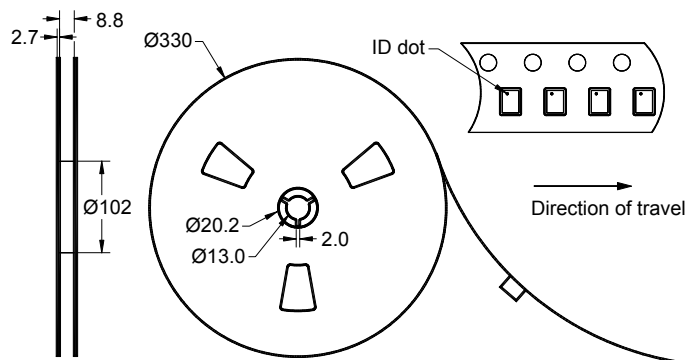
PCB Footprint



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

Preliminary Data Sheet

Tape and Reel




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

Maximum Ratings


Parameter	Symbol	Minimum	Maximum	Unit
Operating Temperature Range	T	-30	+85	°C
Storage Temperature Range	T _{stg}	-40	+85	°C

Important Notes

Warnings

- Electrostatic Sensitive Device (ESD) 
- Avoid ultrasonic exposure

RoHS Compliance

- This product complies with EU directive 2002/95/EC (RoHS) 

Solderability

- Compatible with JEDEC J-STD-020C **Pb-free** process, **260°C** peak reflow temperature ([see soldering profile](#))

Links to Additional Technical Information

[PCB Layout Tips](#)

[Qualification Flowchart](#)

[Soldering Profile](#)

[S-Parameters](#)

[RoHS Information](#)

[Other Technical Information](#)

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