



# SAW Components

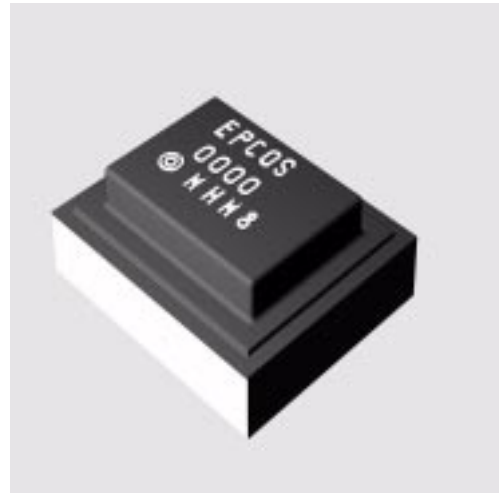
## SAW Duplexer

for WCDMA Band I (UMTS)

<b>Series/type:</b>	<b>B7646</b>
<b>Ordering code:</b>	<b>B39212B7646B310</b>
<b>Date:</b>	<b>October 10, 2007</b>
<b>Version:</b>	<b>2.4</b>

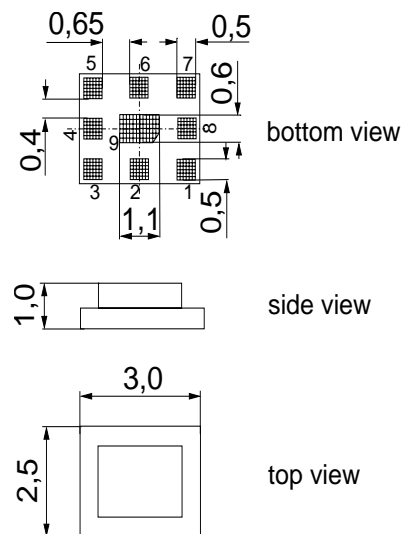
**Application**

- Low-loss SAW duplexer for mobile telephone WCDMA Band I (UMTS) systems
- Low insertion attenuation
- Low amplitude ripple
- Usable passband 60 MHz



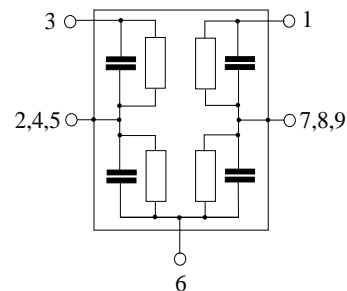
**Features**

- Package size 3.0 x 2.5 x 1.0 mm<sup>3</sup>
- Package code QCS9T
- RoHS compatible
- Approx. weight 0.030 g
- Package for **Surface Mount Technology (SMT)**
- Ni, gold-plated terminals



**Pin configuration**

- 3 TX Input
- 1 RX Output
- 6 Antenna
- 2, 4, 5 To be grounded
- 7, 8, 9 To be grounded





Data sheet



Characteristics

Temperature range for specification:  $T = -15\text{ °C to }+80\text{ °C}$   
 Antenna terminating impedance:  $Z_{ANT} = 50\ \Omega$   
 TX terminating impedance:  $Z_{TX} = 50\ \Omega$   
 RX terminating impedance:  $Z_{RX} = 50\ \Omega$

Characteristics TX - ANT		min.	typ. @ 25 °C	max.	
<b>Center frequency</b>	$f_C$	—	1950.0	—	MHz
<b>Maximum insertion attenuation</b>	$\alpha_{max}$	—	1.6	2.0 <sup>1)</sup>	dB
1920.0 ... 1980.0 MHz					
<b>Amplitude ripple (p-p)</b>	$\Delta\alpha$	—	0.45	0.9	dB
1920.0 ... 1980.0 MHz					
<b>Amplitude ripple (p-p) over any 5 MHz within passband</b>	$\Delta\alpha_{ch}$	—	0.2	0.5	dB
1920.0 ... 1980.0 MHz					
<b>Group delay variation over any 5 MHz within passband</b>	$\Delta\alpha_{ch}$	—	6	20	ns
1920.0 ... 1980.0 MHz					
<b>Input VSWR (TX port)</b>		—	1.5	1.8	
1920.0 ... 1980.0 MHz					
<b>Output VSWR (ANT port)</b>		—	1.3	1.6	
1920.0 ... 1980.0 MHz					
<b>Attenuation</b>	$\alpha$				
0.3 ... 1000.0 MHz		30	40	—	dB
1000.0 ... 1550.0 MHz		30	36	—	dB
1550.0 ... 1600.0 MHz		35	36.5	—	dB
1730.0 ... 1790.0 MHz		30	43	—	dB
2110.0 ... 2155.0 MHz		43	47	—	dB
2155.0 ... 2170.0 MHz		45	50	—	dB
2400.0 ... 2500.0 MHz		25	32	—	dB
2500.0 ... 3840.0 MHz		20	26	—	dB
3840.0 ... 3960.0 MHz		25	41	—	dB
5760.0 ... 6000.0 MHz		10	20	—	dB

1) 2.1 dB in ranges -30...-15°C and +80...+85°C



<b>SAW Components</b>	<b>B7646</b>
<b>SAW Duplexer</b>	<b>1950 / 2140 MHz</b>

Data sheet



**Characteristics**

Temperature range for specification:  $T = -15\text{ °C to }+80\text{ °C}$   
 Antenna terminating impedance:  $Z_{ANT} = 50\ \Omega$   
 TX terminating impedance:  $Z_{TX} = 50\ \Omega$   
 RX terminating impedance:  $Z_{RX} = 50\ \Omega$

Characteristics ANT - RX	min.	typ. @ 25 °C	max.	
<b>Center frequency</b> $f_C$	—	2140.0	—	MHz
<b>Maximum insertion attenuation</b> $\alpha_{max}$ 2110.0 ... 2170.0 MHz	—	2.2	2.5 <sup>1)</sup>	dB
<b>Amplitude ripple (p-p)</b> $\Delta\alpha$ 2110.0 ... 2170.0 MHz	—	0.4	1.0	dB
<b>Amplitude ripple (p-p) over any 5 MHz within passband</b> $\Delta\alpha_{ch}$ 2110.0 ... 2170.0 MHz	—	0.2	0.5	dB
<b>Group delay variation over any 5 MHz within passband</b> $\Delta\alpha_{ch}$ 2110.0 ... 2170.0 MHz	—	7	20	ns
<b>Input VSWR (ANT port)</b> 2110.0 ... 2170.0 MHz	—	1.6	2.0	
<b>Output VSWR (RX port)</b> 2110.0 ... 2170.0 MHz	—	2.0	2.4	
<b>IMD Product Level Limits at <math>f_{TX} = 1950\text{ MHz}</math> <math>f_{RX} = 2140\text{ MHz}</math></b>				
Blocker 1 190.0 MHz	—	-130	-110	dBm
Blocker 2 1760.0 MHz	—	-104	-101	dBm
Blocker 3 4090.0 MHz	—	-116	-110	dBm
<b>Attenuation</b> $\alpha$				
0.3 ... 1730.0 MHz	38	44	—	dB
1730.0 ... 1790.0 MHz	38	45	—	dB
1920.0 ... 1980.0 MHz	50	54	—	dB
2015.0 ... 2025.0 MHz	40	52	—	dB
2025.0 ... 2050.0 MHz	25	42	—	dB
2050.0 ... 2075.0 MHz	8	23	—	dB
2075.0 ... 2085.0 MHz	3	6	—	dB
2400.0 ... 2500.0 MHz	40	58	—	dB
3000.0 ... 4030.0 MHz	30	41	—	dB
4030.0 ... 4150.0 MHz	30	40	—	dB
4150.0 ... 5000.0 MHz	30	40	—	dB
5000.0 ... 6000.0 MHz	15	25	—	dB

1) 2.8 dB in ranges -30...-15°C and +80...+85°C



**SAW Components** **B7646**

**SAW Duplexer** **1950 / 2140 MHz**

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**Characteristics**

Temperature range for specification:  $T = -15\text{ °C to }+80\text{ °C}$   
 Antenna terminating impedance:  $Z_{ANT} = 50\ \Omega$   
 TX terminating impedance:  $Z_{TX} = 50\ \Omega$   
 RX terminating impedance:  $Z_{RX} = 50\ \Omega$

<b>Characterisitcs TX - RX</b>				<b>min.</b>	<b>typ. @ 25 °C</b>	<b>max.</b>	
<b>Isolation</b>			$\alpha$				
	1920.0	... 1980.0	MHz	52	55.5	—	dB
	2110.0	... 2155.0	MHz	46	50	—	dB
	2155.0	... 2170.0	MHz	47	52	—	dB



**SAW Components** **B7646**

**SAW Duplexer** **1950 / 2140 MHz**

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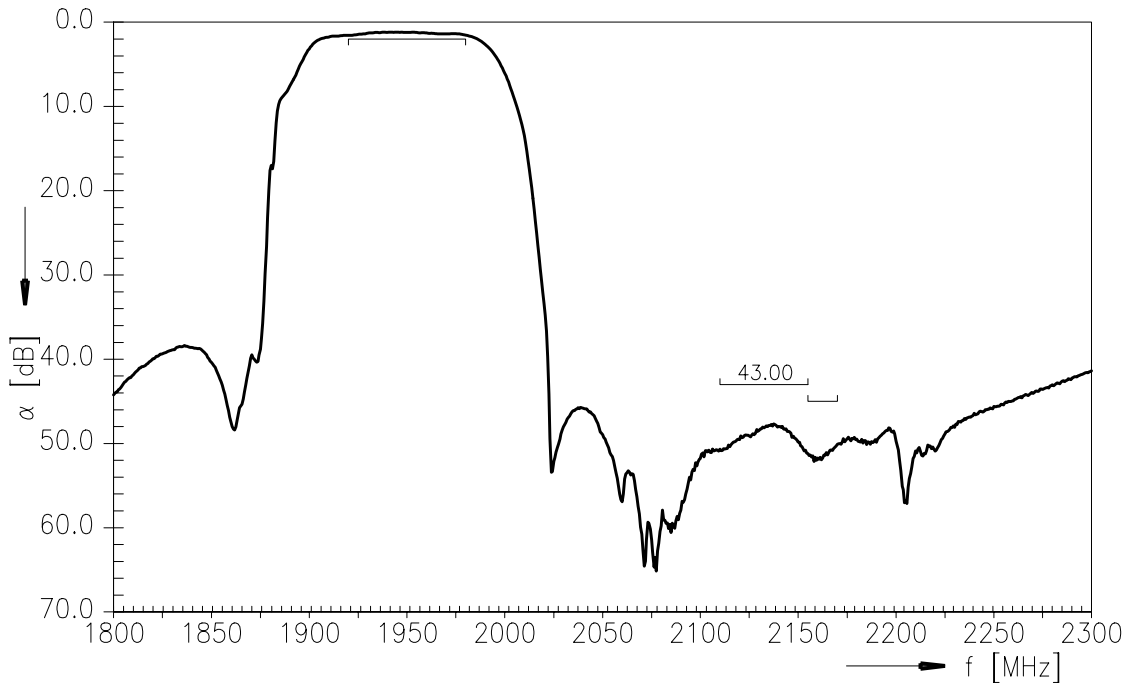
**Maximum ratings**

Operable temperature range	T	-30/+85	°C	machine model, 10 pulses source and load impedance 50 Ω } continuous wave } T = 55°C, 50.000 h
Storage temperature range	T <sub>stg</sub>	-40/+85	°C	
DC voltage	V <sub>DC</sub>	5	V	
ESD voltage	V <sub>ESD</sub>	100 <sup>1)</sup>	V	
Input power at	P <sub>IN</sub>			
1920.0 ... 1980.0 MHz		30	dBm	
elsewhere		10	dBm	

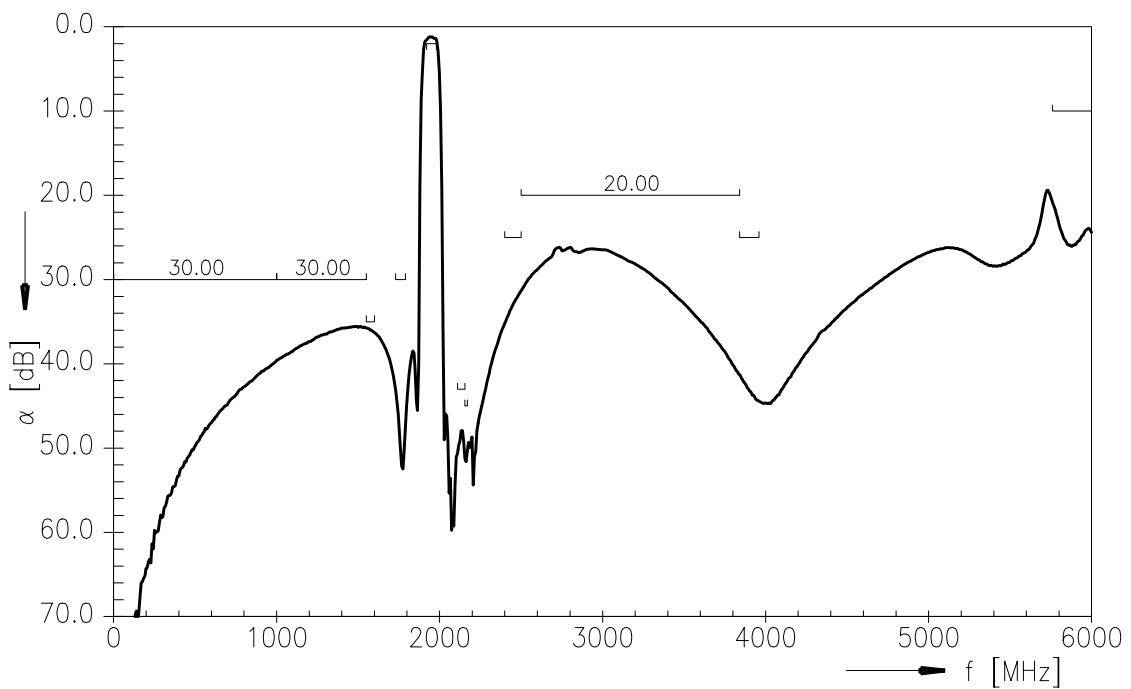
<sup>1)</sup> acc. to JESD22-A115A (machine model), 10 negative & 10 positive pulses.



Frequency Response TX-ANT

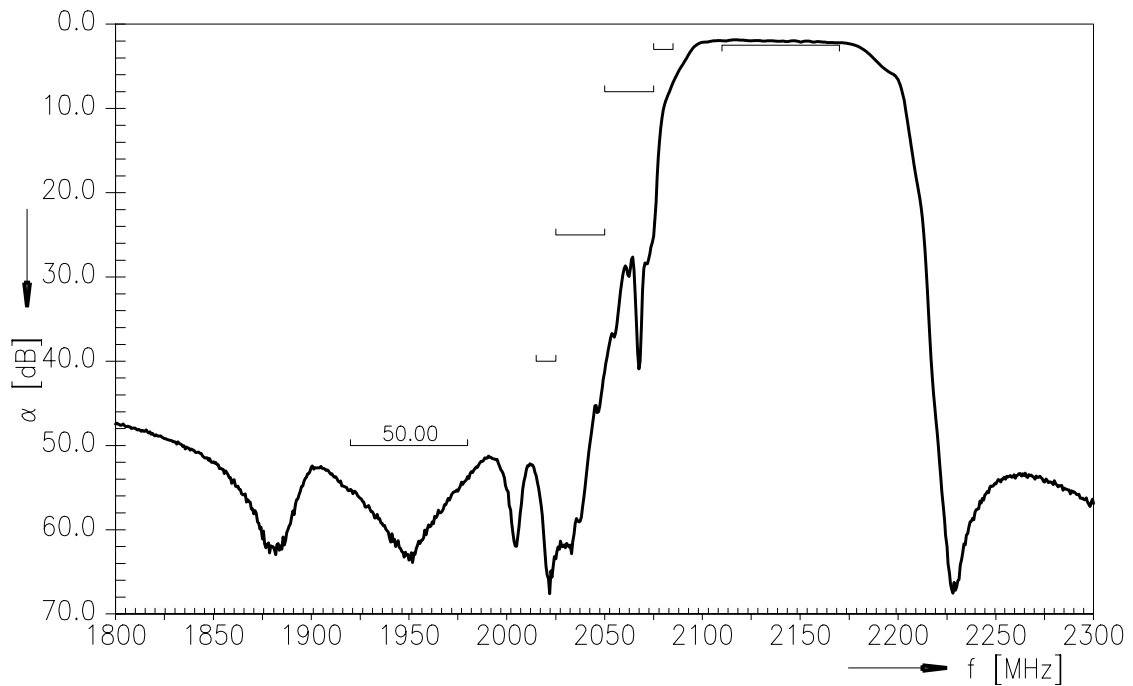


Frequency Response TX-ANT (wideband)

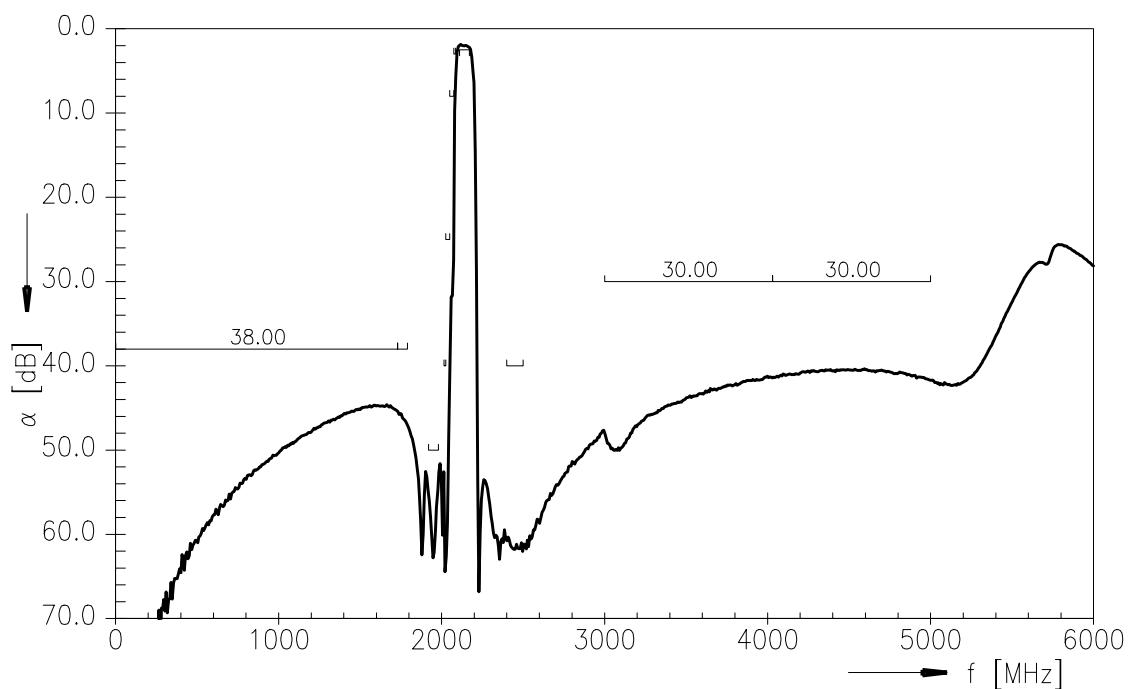




Frequency Response RX-ANT



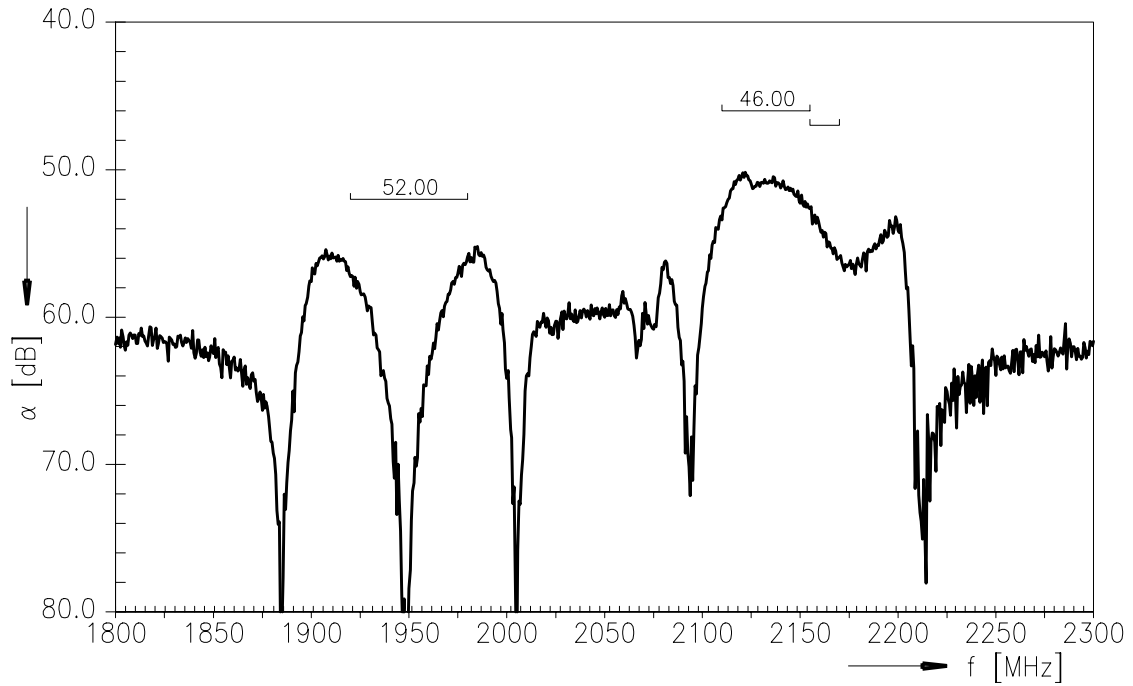
Frequency Response RX-ANT (wideband)



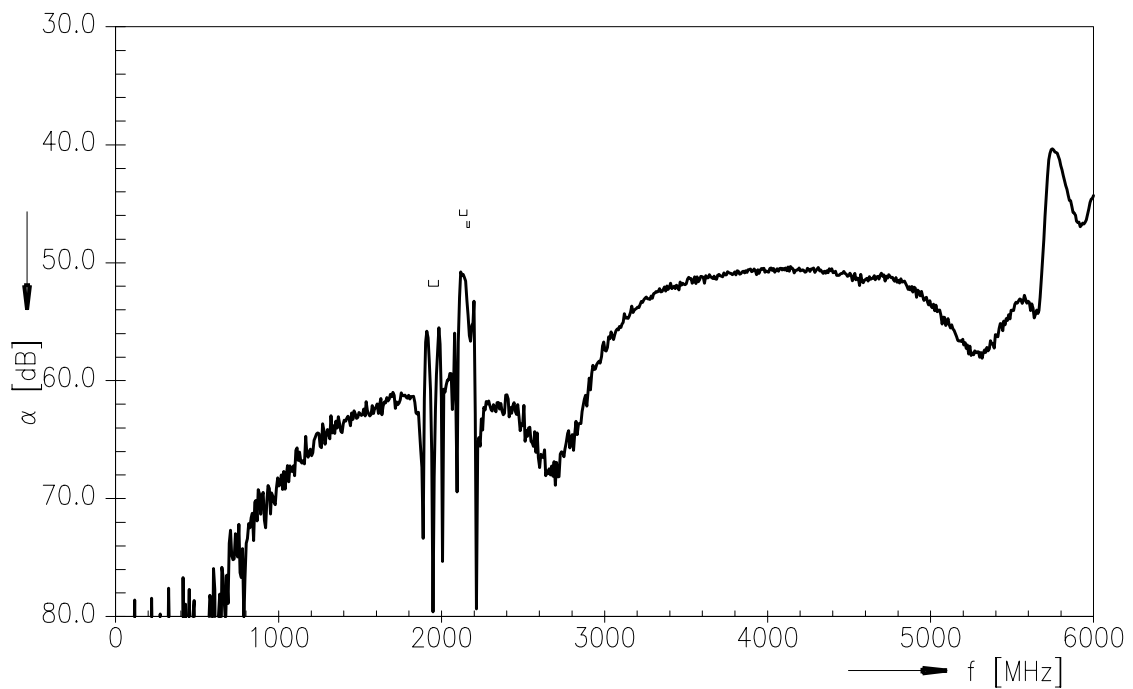




Frequency Response TX-RX



Frequency Response TX-RX (wideband)



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**References**

<b>Type</b>	B7646
<b>Ordering code</b>	B39212B7646B310
<b>Marking and package</b>	C61157-A3-A26
<b>Packaging</b>	F61074-V8211-Z000
<b>Date codes</b>	L_1126
<b>S-parameters</b>	B7646_NB.s3p B7646_WB.s3p
<b>Soldering profile</b>	S_6001
<b>RoHS compatible</b>	defined as compatible with the following documents: "DIRECTIVE 2002/95/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 27 January 2003 on the restriction of the use of certain hazardous substances in electrical and electronic equipment. 2005/618/EC from April 18th, 2005, amending Directive 2002/95/EC of the European Parliament and of the Council for the purposes of establishing the maximum concentration values for certain hazardous substances in electrical and electronic equipment."

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