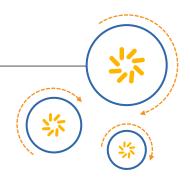


RF360 Europe GmbH

A Qualcomm - TDK Joint Venture



SAW Components

SAW Duplexer

Cellular / WCDMA Band V

Series/type: B8577

Ordering code: B39881B8577P810

Date: June 4, 2013

Version: 2.0

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SAW Components B8577

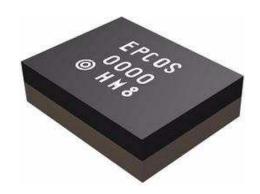
SAW Duplexer 836.5 / 881.5 MHz

Data sheet



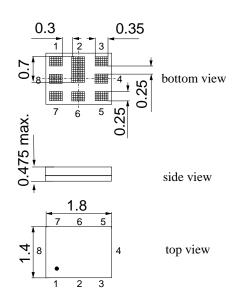
Application

- Multimode SAW duplexer for mobile telephone Cellular / WCDMA Band V systems
- Low insertion attenuation
- Low amplitude ripple
- High Tx band isolation
- Single ended to balanced transformation in Antenna Rx path
- Impedance transformation from 50 Ω to 100 Ω in Antenna RX path



Features

- Package size 1.8 x 1.4 mm²
- Max. package height 0.475 mm
- RoHS compatible
- Package for Surface Mount Technology (SMT)
- Ni, Au-plated terminals
- Electrostatic Sensitive Device (ESD)
- Moisture Sensitivity Level 3



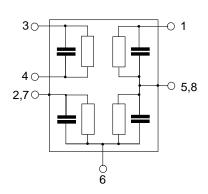
Pin configuration

■ 1 TX Input

■ 3,4 RX Output (balanced)

■ 6 Antenna

■ 2, 5, 7, 8 To be grounded





SAW Components B8577

SAW Duplexer 836.5 / 881.5 MHz

Data sheet SMD

Characteristics

Temperature range for specification: $T = -30 \,^{\circ}\text{C}$ to +85 $^{\circ}\text{C}$ Antenna terminating impedance: $Z_{\text{ANT}} = 50 \,\Omega$ II 8.2 nH RX terminating impedance: $Z_{\text{RX}} = 100 \,\Omega$ (balanced)

TX terminating impedance: $Z_{TX} = 50\Omega$

Characterisitcs TX - ANT			min.	typ.	max.	
				@ 25 °C		
Center frequency		f _C	_	836.5	_	MHz
Maximum insertion attend	uation	$\alpha_{\sf max}$				
824.0 849	.0 MHz			1.5	2.3	dB
@f _{Carrier} 826.4 846	.6 MHz	$\alpha_{\text{WCDMA}}^{1)}$	_	1.3	2.1	dB
Amplitude ripple		$\Delta \alpha$				
824.0 849	.0 MHz		_	0.6	1.4	dB
Error Vector Magnitude						
@f _{Carrier} 826.4 846	.6 MHz	EVM ²⁾	_	2.1	4.0	%
Input VSWR (TX port)						
824.0 849	.0 MHz			1.5	2.0	
Output VSWR (ANT port)						
824.0 849	.0 MHz			1.4	2.0	

¹⁾ Attenuation of WCDMA signal ("Powertransferfunction"). Please refer to annotation on page (8).

²⁾ Error Vector Magnitude (EVM) based on definition given in 3GPP TS 25.141.



SAW Components

B8577

SAW Duplexer 836.5 / 881.5 MHz

Data sheet

SMD

Characteristics

 $T = -30 \,^{\circ}\text{C} \text{ to } +85 \,^{\circ}\text{C}$ Temperature range for specification: $Z_{ANT}=$ Antenna terminating impedance: $50\,\Omega$ II 8.2 nH $Z_{RX} = 100 \Omega$ (balanced) $Z_{TX} = 50\Omega$ RX terminating impedance:

TX terminating impedance:

Characteriaites TV ANT		41.00		
Characterisitcs TX - ANT	min.	typ.	max.	
- <u>-</u>		@ 25 °C		
Absolute attenuation α				
10.0 420.0 MHz	40	45	_	dB
420.0 494.0 MHz	38	42	_	dB
494.0 701.0 MHz	35	39	_	dB
701.0 728.0 MHz	35	40	_	dB
728.0 764.0 MHz	35	41		dB
764.0 804.0 MHz	30	37		dB
860.0 869.0 MHz	3	10		dB
869.0 894.0 MHz	45	52	_	dB
@ $f_{Carrier}$ 871.4 891.6 MHz $\alpha_{WCDMA}^{(1)}$	48	53	_	dB
1236.0 1341.0 MHz	40	47	_	dB
1574.0 1577.0 MHz	35	39		dB
1638.0 1708.0 MHz	33	36	_	dB
1844.9 1879.9 MHz	30	34	_	dB
1884.5 1919.6 MHz	30	34	_	dB
1930.0 1990.0 MHz	30	33	_	dB
2110.0 2170.0 MHz	28	31	_	dB
2400.0 2557.0 MHz	25	28	_	dB
3286.0 3406.0 MHz	20	25	_	dB
4110.0 4255.0 MHz	20	24	_	dB
4934.0 5350.0 MHz	10	14	_	dB
5725.0 5953.0 MHz	5	10		dB

¹⁾ Attenuation of WCDMA signal ("Powertransferfunction"). Please refer to annotation on page (8).



SAW Components B8577

836.5 / 881.5 MHz **SAW Duplexer**

Data sheet SMD

Characteristics

Temperature range for specification: $T = -30 \,^{\circ}\text{C} \text{ to } +85 \,^{\circ}\text{C}$ Antenna terminating impedance: $Z_{ANT}=$ 50 Ω II 8.2 nH $Z_{RX} = Z_{TX} =$ RX terminating impedance: 100 Ω (balanced)

TX terminating impedance: 50Ω

Characterisitcs ANT - RX		min.	typ.	max.	
			@ 25 °C		
Center frequency	f _C	_	881.5	_	MHz
Maximum insertion attenuation	$\alpha_{\sf max}$				
869.0 894.0 MHz		_	1.7	2.4	dB
@f _{Carrier} 871.4 891.6 MHz	$\alpha_{\text{WCDMA}}^{1)}$		1.5	2.2	dB
Amplitude ripple (p-p)	$\Delta \alpha$				
869.0 894.0 MHz		_	0.5	1.2	dB
Error Vector Magnitude					
@f _{Carrier} 871.4 891.6 MHz	EVM ²⁾	_	1.7	3.5	%
Input VSWR (ANT port)					
869.0 894.0 MHz		_	1.7	2.0	
Output VSWR (RX port)					
869.0 894.0 MHz			1.6	2.0	
Common mode rejection ratio					
869.0 894.0 MHz	CMRR	23 ³⁾	27	_	dB

¹⁾ Attenuation of WCDMA signal ("Powertransferfunction"). Please refer to annotation on page (8).

²⁾ Error Vector Magnitude (EVM) based on definition given in 3GPP TS 25.141.

³⁾ A combination of 10° phase balance and 1 dB amplitude balance corresponds to 19.6 dB CMRR



B8577

SAW Components

836.5 / 881.5 MHz **SAW Duplexer**

Data sheet SMD

Characteristics

 $T = -30 \,^{\circ}\text{C} \text{ to } +85 \,^{\circ}\text{C}$ Temperature range for specification: $Z_{ANT}=$ Antenna terminating impedance: $50\,\Omega$ II 8.2 nH $Z_{RX} = Z_{TX} =$ RX terminating impedance: 100 Ω (balanced)

TX terminating impedance: 50Ω

Characterisitcs ANT - RX min. typ. max.				
Characterisitcs ANT - RX		typ.	max.	
		@ 25 °C		
IMD product level limits ¹⁾				
at $f_{TX} = 836.5 \text{ MHz} f_{RX} = 881.5 \text{ MHz}$				
Blocker 1 45.0 MHz	_	-125		dBm
Blocker 2 791.5 MHz	_	-106	_	dBm
Blocker 3 1718.0 MHz	_	-106	_	dBm
Blocker 4 2554.5 MHz	-	-115		dBm
Attenuation α				
10.0 447.0 MHz	45	75		dB
447.0 824.0 MHz	45	61	_	dB
824.0 849.0 MHz	50	60	_	dB
$@f_{Carrier}$ 826.4 846.6 MHz α_{W}	_{CDMA} ²⁾ 55	61		dB
849.0 854.0 MHz	10	56		dB
854.0 871.5 MHz	0.9	1.3	_	dB
909.0 914.0 MHz	10	20	_	dB
914.0 940.0 MHz	20	27	_	dB
940.0 1000.0 MHz	40	49	_	dB
1000.0 1693.0 MHz	40	53	_	dB
1693.0 1850.0 MHz	45	54	_	dB
1850.0 1920.0 MHz	40	54	_	dB
1920.0 5000.0 MHz	40	46	_	dB
5000.0 6000.0 MHz	30	41	<u> </u>	dB

¹⁾ Power levels: 21.5 dBm Tx signal, -15dBm blocker at antenna port.

²⁾ Attenuation of WCDMA signal ("Powertransferfunction"). Please refer to annotation on page (8).



SAW Components

B8577

SAW Duplexer 836.5 / 881.5 MHz

Data sheet SMD

Characteristics

 $T = -30 \,^{\circ}\text{C} \text{ to } +85 \,^{\circ}\text{C}$ Temperature range for specification: $Z_{ANT}=$ Antenna terminating impedance: $50\,\Omega$ II 8.2 nH $Z_{RX} = Z_{TX} =$ RX terminating impedance: 100Ω (balanced)

TX terminating impedance: 50Ω

Characterisitcs TX - RX		min.	typ. @ 25 °C	max.	
Isolation	α				
824.0 849.0 MHz		54	63	_	dB
@f _{Carrier} 826.4 846.6 MHz	$\alpha_{\text{WCDMA}}^{3)}$	57	64	_	dB
869.0 894.0 MHz		50	55	_	dB
@f _{Carrier} 871.4 891.6 MHz	$\alpha_{WCDMA}^{1)}$	52	56	_	dB
1574.0 1577.0 MHz		40	64	_	dB
1638.0 1708.0 MHz		40	62	_	dB
2462.0 2557.0 MHz		40	56	_	dB
Common Mode Isolation					
824.0 849.0 MHz		42	47		dB
@f _{Carrier} 826.4 846.6 MHz	$\alpha_{\text{WCDMA}}^{3)}$	42	48	_	dB

¹⁾ Attenuation of WCDMA signal ("Powertransferfunction"). Please refer to annotation on page (8).



SAW Components B8577

SAW Duplexer 836.5 / 881.5 MHz

Data sheet



Annotation for characteristics section

Attenuation of WCDMA signal ("Powertransferfunction", $\alpha_{\text{WCDMA}})$ is determined by

$$\int_{\infty}^{\infty} \left| S_{ds21}(f) H_{RRC}(f - f_{Carrier}) \right|^2 df$$

 $f_{Carrier}$ according to 3GPP TS 25.101 (e.g. for WCDMA Band 5-Passband, $f_{Carrier}$ ranges from 826.4 MHz (lowest TX channel) to 846.6 MHz (highest TX channel)). $H_{RRC}(f)$ is the transfer function of the root-raised cosine transmit pulse shaping filter according to 3GPP TS 25.101 with the following normalization:

$$\int_{-\infty}^{\infty} \left| H_{RRC}(f) \right|^2 df = 1$$

Maximum ratings

Storage temperature range	T _{stg}	-40/+85 ¹⁾	°C	
DC voltage	V_{DC}	5 ²⁾	V	
ESD voltage	V_{ESD}	1003)	V	Machine Model
Input power	P_{IN}			source and load impedance 50 Ω
824.0 849.0 MHz		28	dBm	continuous wave
elsewhere		10	dBm	$\int T = 50^{\circ} \text{C}, 3000 \text{ h}$

¹⁾ extended upperlimit: 168h@125°C acc. to IEC 60068-2-2 Bb

^{2) 168}h Damp Heat Steady State acc. to IEC 60068-2-67 Cy

³⁾ acc. to JESD22-A115B (MM - Machine Model), 10 negative and 10 positive pulses.

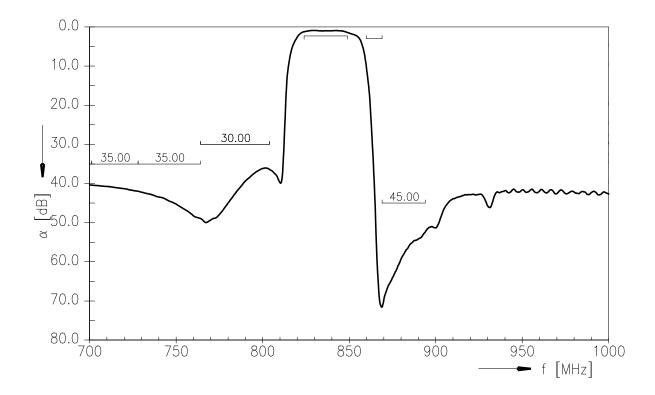


SAW Components B8577
SAW Duplexer 836.5 / 881.5 MHz

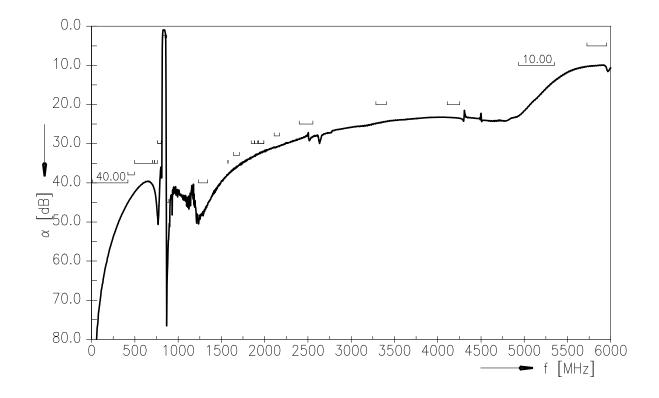
Data sheet



Transfer function TX (Power transfer function)



Transfer function TX (wideband)



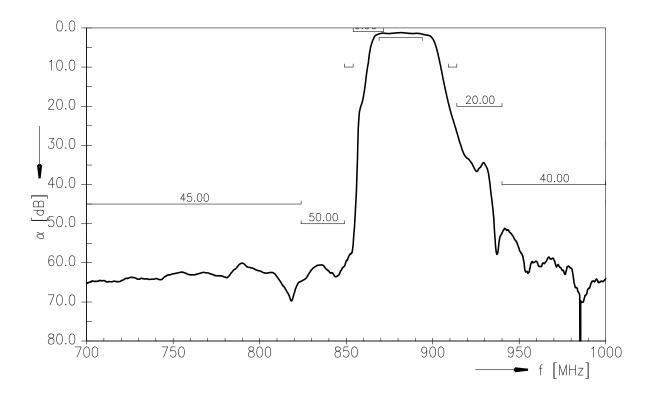


SAW Components B8577
SAW Duplexer 836.5 / 881.5 MHz

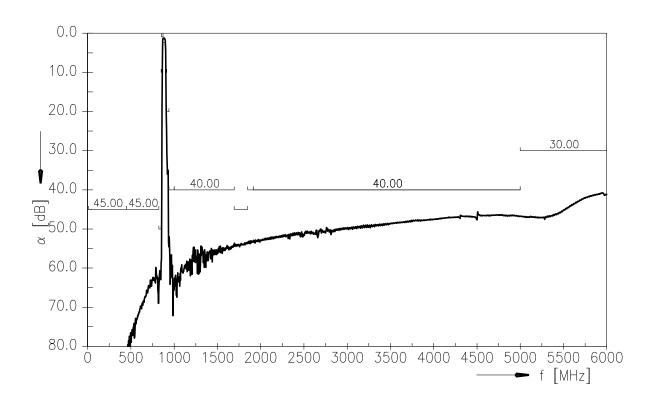
Data sheet



Transfer function RX (Power transfer function)



Transfer function RX (wideband)



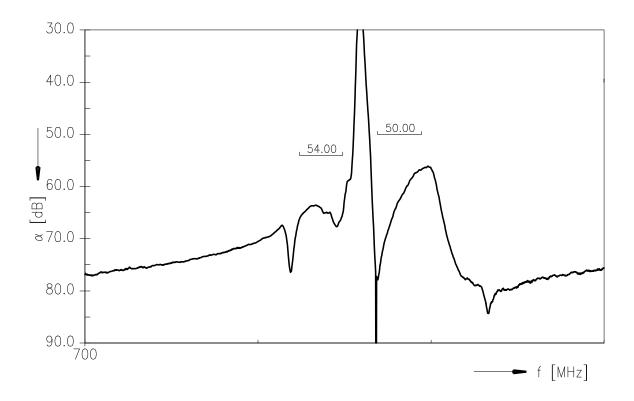


SAW Components B8577
SAW Duplexer 836.5 / 881.5 MHz

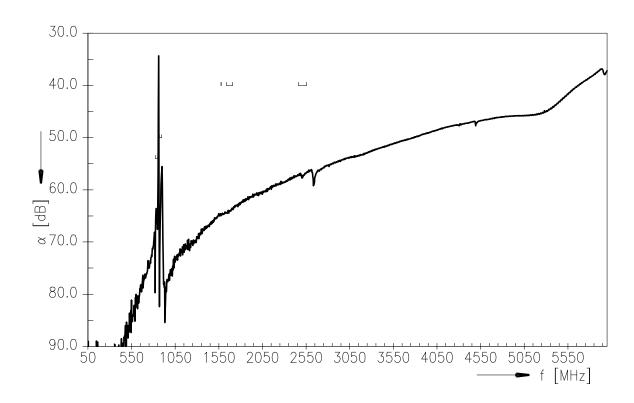
Data sheet



Isolation TX-RX (Power transfer function)



Isolation TX-RX (wideband)





SAW Components B8577 836.5 / 881.5 MHz **SAW Duplexer Data sheet** SMD **Smith charts** S₁₁ TX-port (pin 1) $|S_{11}|$ $\Box = 824.0$ $\bigcirc = 849.0$ $\Box = 869.0$ O = 894.02.5 VSWR 2.0 1.5 1.0 880 900 820 840 860 normal impedance: 50.00 $\boldsymbol{\Omega}$ frequency [MHz] **S**₃₃ RX-port (pins 3/4) $|S_{33}|$ 3.0 \Box = 824.0 \bigcirc = 849.0 \Box = 869.0 \bigcirc = 894.0 2.5 2.0 1.5 1.0 820 840 860 880 900 normal impedance: 100.00 $\boldsymbol{\Omega}$ frequency [MHz] **S₂₂ ANT-port (pin 6)** 3. 0 $|S_{22}|$ $\Box = 824.0$ O = 849.0 $\Box = 869.0$ $\bigcirc = 894.0$ 2.5 VSWR 2.0 1.5

840

860

frequency [MHz]

880

1.0-

820

900

normal impedance: 50.00 $\boldsymbol{\Omega}$



SAW Components	B8577
SAW Duplexer	836.5 / 881.5 MHz

Data sheet



References

Туре	B8577
Ordering code	B39881B8577P810
Marking and package	C61157-A8-A69
Packaging	F61074-V8259-Z000
Date codes	L_1126
S-parameters	B8577_NB_UN.s4p; B8577_WB_UN.s4p See file header for port/pin assignment table
Soldering profile	S_6001
RoHS compatible	RoHS-compatible means that products are compatible with the requirements according to Art. 4 (substance restrictions) of Directive 2011/65/EU of the European Parliament and of the Council of June 8 th , 2011, on the restriction of the use of certain hazardous substances in electrical and electronic equipment ("Directive") with due regard to the application of exemptions as per Annex III of the Directive in certain cases.
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