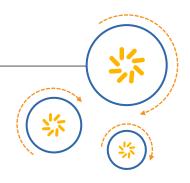


RF360 Europe GmbH

A Qualcomm - TDK Joint Venture



SAW Components

SAW Duplexer for smallcells

Band 5 (LTE)

Series/type: B8013

Ordering code: B39881B8013P810

Date: July 23, 2015

Version: 2.6

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SAW Duplexer for smallcells
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B8013

SAW Duplexer for smallcells

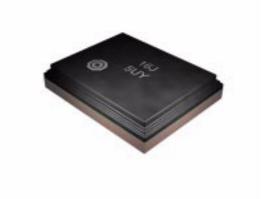
836.5 / 881.5 MHz

Data sheet



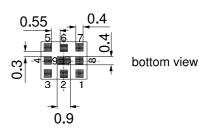
Application

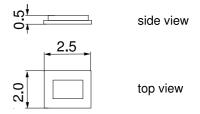
- Low-loss RF SAW Duplexer for smallcells (Band V)
- Usable passband 25 MHz
- Unbalanced to unbalanced operation
- High power durability in downlink
- Rx = UPLINK = 824-849 MHz
- Tx = DOWNLINK = 869-894 MHz



Features

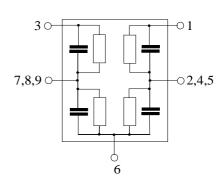
- Package size 2.5 x 2.0 mm²
- Max. Package height 0.5mm
- RoHS compatible
- Package for Surface Mount Technology (SMT)
- Ni, gold-plated terminals
- Electrostatic Sensitive Device (ESD)
- Moisture Sensitivity Level 3





Pin configuration

- 1 Tx Input
- 3 Rx output
- 6 Antenna
- 2,4,5,7,8,9 To be grounded





B8013

SAW Duplexer for smallcells

836.5 / 881.5 MHz

Data sheet

SMD

Characteristics

 $T = -10 \,^{\circ}\text{C} \text{ to } +85 \,^{\circ}\text{C}$ Temperature range for specification:

TX terminating impedance: $Z_{Tx} =$ 50Ω

 $Z_{Ant}^{TA} = 50 \Omega \parallel 8.7 \text{ nH}$ $Z_{Rx} = 50 \Omega$ ANT terminating impedance:

RX teminating impedance:

Characteristics ANT-Rx	min.	typ. @ 25 °C	max.			
Center frequency	f _C	_	836.5	_	MHz	
Maximum insertion attenuation						
824.0 849.0	MHz	α_{max}	_	2.6	3.1 ¹⁾	dB
Amplitude ripple (p-p)						
824.0 849.0	MHz	$\Delta \alpha$	_	1.3	1.8 ²⁾	dB
Error Vector Magnitude						
@f _{Carrier} 826.4 846.6	MHz	EVM 3)	_	3.0	4.5	%
VSWR (Rx port)						
824.0 849.0	MHz		_	2.0	$2.3^{4)}$	
VSWR (Ant port)						
824.0 849.0	MHz		_	1.9	2.34)	
Absolute Attenuation		α				
869.0 894.0	MHz	CA .	50	57		dB
1648.0 1698.0	MHz		25	51	_	dB
1840.0 1870.0	MHz		25	48	_	dB
1930.0 1990.0	MHz		25	46		dB
2110.0 2170.0	MHz		25	45	_	dB
2400.0 2484.0	MHz		25	42	_	dB
2472.0 2547.0	MHz		25	41		dB
3296.0 3396.0	MHz		20	39	_	dB

 $^{^{1)}}$ Specification for ILmax is 3.2dB for –20 $^{\circ}\text{C}$ to +85 $^{\circ}\text{C}$.

²⁾ Specification for AR is 1.9dB for -20 °C to +85 °C.

³⁾ Time to failure (TTF) according to accelerated power durability test, and wear out models.

⁴⁾ Specification for VSWR is 2.4 for -20 °C to +85 °C.



B8013

SAW Duplexer for smallcells

836.5 / 881.5 MHz

Data sheet

 \leq MD

Characteristics

 $T = -10 \,^{\circ}\text{C} \text{ to } +85 \,^{\circ}\text{C}$ Temperature range for specification:

TX terminating impedance: $Z_{Tx} =$ 50Ω

 $Z_{Ant} = Z_{Rx} =$ ANT terminating impedance: $50 \Omega \parallel 8.7 \text{ nH}$

RX teminating impedance: 50Ω

Characteristics Tx-ANT	min.	typ. @ 25 °C	max.	
Center frequency f _c	_	881.5	_	MHz
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	_	1.9	2.5 ¹⁾	dB
Amplitude ripple (p-p) $$\Delta\alpha$$ $869.0~\dots$ $894.0~\text{MHz}$	_	0.6	1.3 ²⁾	dB
Error Vector Magnitude @f _{Carrier} 871.4 891.6 MHz EVM ³⁾	_	1.4	3.5	%
VSWR (Tx port) 869.0 894.0 MHz VSWR (Ant Port)	_	1.9	2.1 ⁴⁾	
869.0 894.0 MHz	_	1.8	2.1 ⁴⁾	
Attenuation α				
824.0 849.0 MHz	52	59	_	dB
1574.4 1576.4 MHz	45	58	_	dB
1602.5 1615.5 MHz	35	59	_	dB
1710.0 1788.0 MHz	40	59	_	dB
1850.0 1910.0 MHz	40	57	_	dB
1920.0 1980.0 MHz	40	55	_	dB
2400.0 2484.0 MHz	21	50	_	dB
2607.0 2682.0 MHz 3476.0 3576.0 MHz	21 21	47 49	_	dB dB
0170.0 0070.0 WH12				

 $^{^{1)}}$ Specification for ILmax is 2.6dB for –20 $^{\circ}\text{C}$ to +85 $^{\circ}\text{C}$.

²⁾ Specification for AR is 1.4dB for -20 °C to +85 °C.

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

⁴⁾ Specification for VSWR is 2.2 for -20 °C to +85 °C.



B8013

SAW Duplexer for smallcells

836.5 / 881.5 MHz

Data sheet

 \leq MD

Characteristics

 $T = -10 \,^{\circ}\text{C} \text{ to } +85 \,^{\circ}\text{C}$ Temperature range for specification:

TX terminating impedance: $Z_{Tx} =$ 50Ω

 $Z_{Ant}^{TA} = 50 \Omega \parallel 8.7 \text{ nH}$ $Z_{Rx} = 50 \Omega$ ANT terminating impedance:

RX teminating impedance:

Characteristic	cs Tx-Rx	C				min.	typ. @ 25 °C	max.	
Attenuation					α				
	869.0		894.0	MHz		53	56		dB
	824.0		849.0	MHz		52	58	_	dB

Maximum Ratings

Storage temperature range	T _{stg}	-40/+85	°C	
DC voltage	V_{DC}	0	V	
ESD voltage	V_{ESD}	1001)	V	machine model, 1 pulse
Input power at pin 1				Source and load impedance 50Ω
871.5 891.5 MHz	P _{in}	28 ²⁾	dBm	Pin 28dBm average - 39dBm peak LTE 5 MHz dowlink T = 55°C, 100 000 hrs
elsewhere	P_{in}	10	dBm	
Operating lifetime with Ouput power at antenna				Source and load impedance 50 Ω
871.5 891.5 MHz		24 ³⁾	dBm	Continuous wave T = 55°C, 100k hrs

¹⁾ acc. to JESD22-A115B (machine model), +/-1 pulse.

²⁾ Time to failure (TTF) according to accelerated power durability test, and wear out models.

³⁾ according to accelerated High Temperating Operating Life (HTOL) test.

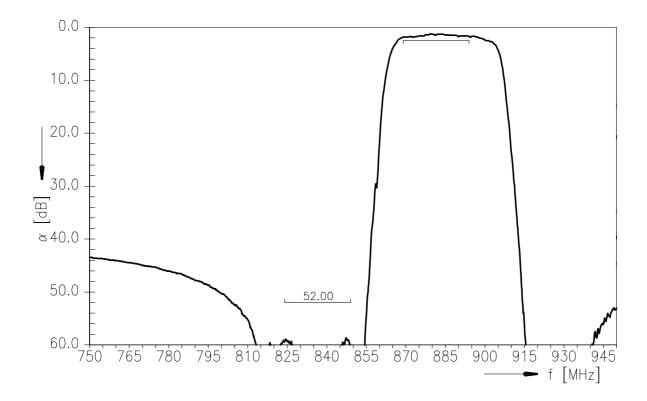


SAW Duplexer for smallcells

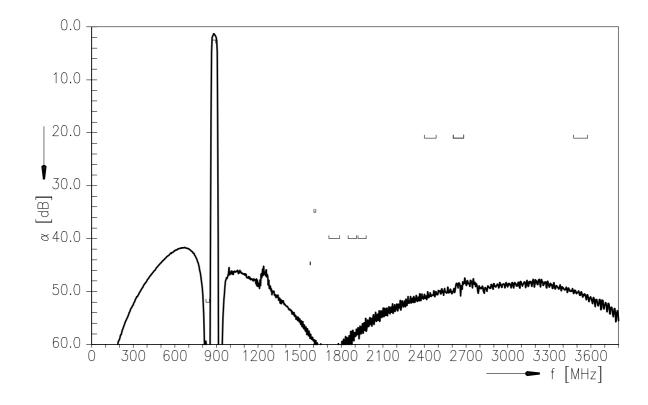
836.5 / 881.5 MHz

Data sheet SMD

Frequency response TX-ANT



Frequency response TX-ANT (wideband)



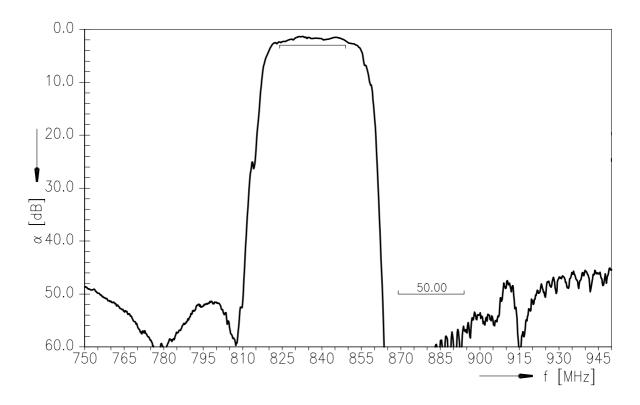


SAW Duplexer for smallcells

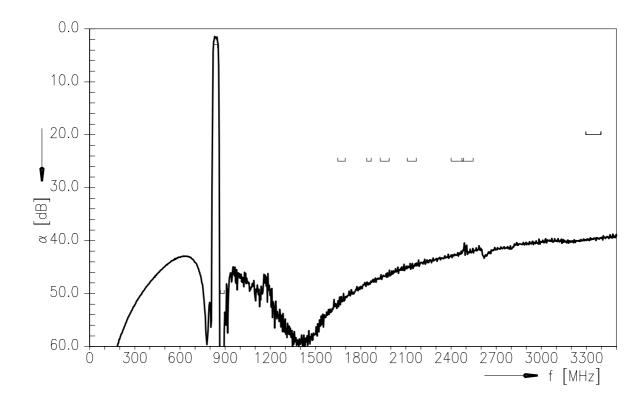
836.5 / 881.5 MHz

Data sheet SMD

Frequency response ANT-RX



Frequency response ANT-RX (wideband)



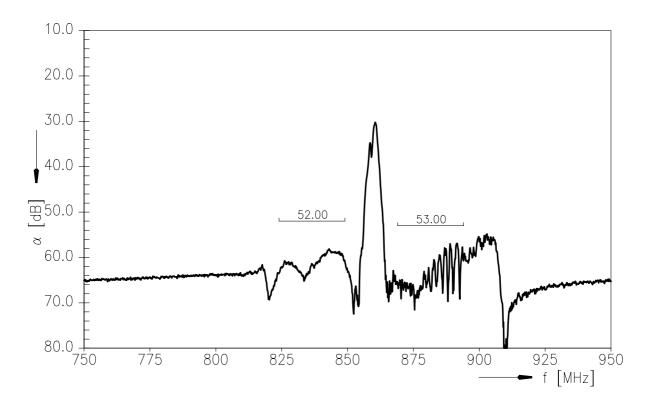


SAW Components B8013 **SAW Duplexer for smallcells**

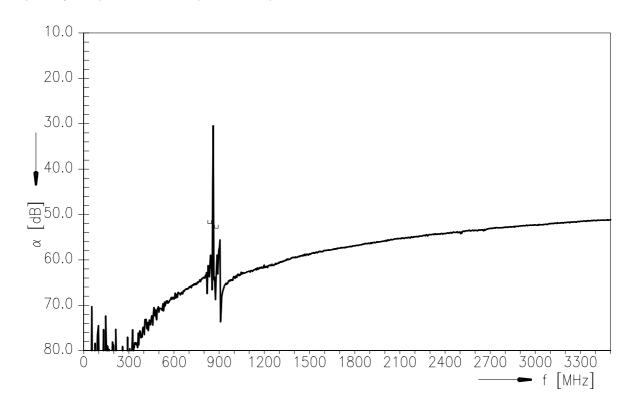
836.5 / 881.5 MHz



Frequency response TX-RX



Frequency response TX-RX (wideband)





SAW Components B8013 **SAW Duplexer for smallcells** 836.5 / 881.5 MHz **Data sheet** =MD **Return Loss** S₁₁ TX- port S₂₂ ANT-port S₃₃ RX-port $|S_{11}|$ 2.5 $\Box = 869.0$ $\bigcirc = 894.0$ $\Box = 824.0$ O = 849.02.0 VSWR 1.5 1. 91. 750 850 800 900 950 normal impedance: 50.00 $\,\cap\,$ frequency [MHz] $|S_{33}|$ 2.5 $\Box = 869.0$ O = 894.0 $\Box = 824.0$ O = 849.02.0 VSWR 1.5 1. 91. . 750 800 850 900 950 normal impedance: 50.00 ∩ frequency [MHz] $|S_{\underline{22}}|$ 2.5 $\Box = 869.0$ $\bigcirc = 894.0$ $\bigcirc = 824.0$ $\bigcirc = 849.0$ 2.0 VSWR -1.5 1. 91. 750 800 850 900 950 normal impedance: 50.00 ∩ frequency [MHz]



SAW Duplexer for smallcells 836.5 / 881.5 MHz

Data sheet



References

Туре	B8013
Ordering code	B39881B8013P810
Marking and package	C61157-A3-A27
Packaging	F61074-V8232-Z000
Date codes	L_1126
S-parameters	B8013_NB_UN.s3p, B8013_WB_UN.s3p 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 8th, 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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