



SAW Components

SAW Frontend Module

GSM 850 / EGSM / DCS / PCS
WCDMA 850 / 1900 / 2100

Series/Type: D2024
Ordering code: B30674D2024R424

Date: Dec 19, 2008
Version: 2

Data Sheet

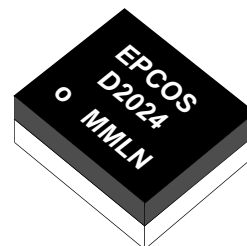
Revision History: Changes compared to previous iteration issue

ISSUE	ORIGINATOR	DETAIL SPEC CHANGES	DATE
1	Puffer	Initial release	12.02.2007
2	Puffer	max. height changed to 1.3 mm	04.08.2008

Data Sheet

Application

- Low-loss SAW frontend module for mobile telephone system
- Covering GSM850, GSM900, GSM1800, GSM1900, WCDMA 850, 1900, 2100 bands
- Integration of TX low pass filters, switches and decoder
- Integration of GSM 850, EGSM, PCN and PCS RX SAWs
- Balanced outputs of all RX ports
- Integration of ESD protection at Ant port to 8kV acc. IEC-61000-4-2 (contact discharge)



Features

- Package for **Surface Mounted Technology (SMT)**
- RoHS compliant
- Approx. weight 100 mg
- Ni / Au - plated terminals

Pin configuration

- | | |
|------------------|------------------|
| ■ 1 | Antenna |
| ■ 4 | Ctrl 1 |
| ■ 5 | Ctrl 2 |
| ■ 6 | Ctrl 3 |
| ■ 7 | VDD |
| ■ 9 | PCN / PCS Tx |
| ■ 11 | GSM850 / EGSM Tx |
| ■ 12,13 | PCN Rx |
| ■ 14,15 | PCS Rx |
| ■ 16,17 | EGSM Rx |
| ■ 18, 19 | GSM850 Rx |
| ■ 20 | WCDMA 2100 |
| ■ 21 | WCDMA 850 |
| ■ 22 | WCDMA 1900 |
| ■ 2,3,8,10,23,24 | GND |

Data Sheet
Maximum Ratings

Input power Tx EGSM	P_{IN}	+35	dBm	@ antenna port VSWR ∞ :1 without damage
Input power Tx EGSM	P_{IN}	+35	dBm	source and load impedance 50 Ω peak power of GSM signal
Input power Tx DCS / PCS	P_{IN}	+33	dBm	@ antenna port VSWR ∞ :1 without damage
Input power Tx DCS / PCS	P_{IN}	+33	dBm	source and load impedance 50 Ω peak power of GSM signal
Input power WCDMA	P_{IN}	+29	dBm	source and load impedance 50 Ω
Input power Rx ports	P_{IN}	+10	dBm	source and load impedance 50 Ω peak power of GSM signal
Transmitter duty cycle		4:8 CW		GSM WCDMA
Operable temperature range	T	-30 ... +85	°C	
Storage temperature range	T	-30 ... +85	°C	stored as individual component
Storage temperature range	T_{stg}	0 ... +40	°C	stored in tape
Power supply voltage	V_{DD}	-0.3 ... 4	V	
DC voltage	V_{DD}	-0.3 ... $V_{DD}+0.3V$	V	at any input, except Rx ports
DC voltage	V_{DC}	5	V	at Rx ports

ESD Ratings

Antenna port	V_{max}	8	kV	EN 61000-4-2 contact discharge
Tx and WCDMA port	V_{max}	1.5	kV	MIL_STD 883 Method 3015.7 Human Body Model
Rx ports	V_{max}	250	V	JESD22-A114B Human Body Model
GSM850 / EGSM Rx ports	V_{max}	100	V	JESD22-A115A Machine Model
PCN / PCS Rx ports	V_{max}	50	V	JESD22-A115A Machine Model

Data Sheet

Control Logic

Switch Mode	CTRL 1	CTRL 2	CTRL 3
GSM850 / EGSM TX	1	0	1
PCN / PCS TX	0	1	1
WB850	0	1	1
WB1900	0	0	1
WB2100	1	0	1
GSM850 RX	0	0	0
EGSM RX	1	0	0
PCN RX	1	1	0
PCS RX	0	1	0
All Off	1	1	1

Control Characteristics

		min.	typ.	max.		
Power supply voltage	V_{DC}	2.5	2.75	3.2	V	V_{DD}
Control voltage high	V_{DC}	1.4			V	Ctrl 1, Ctrl 2, Ctrl 3
Control voltage low	V_{DC}			0.4	V	Ctrl 1, Ctrl 2, Ctrl 3
Power supply current max	I_{DC}		13	50	μA	
Control current max	I_{DC}			2	μA	
Switching Speed	T			3	μs	

Data Sheet

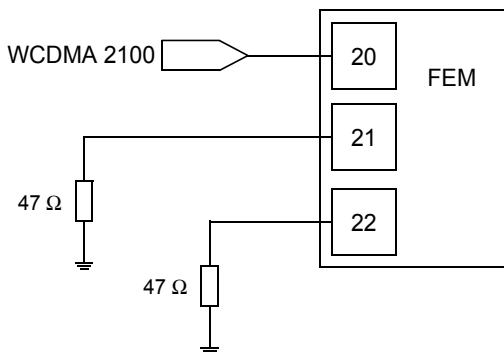
Application Note

1. Termination of unused port

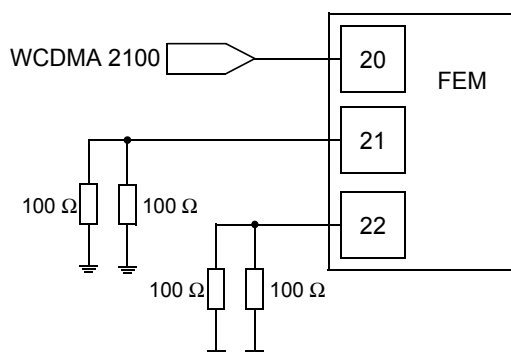
Termination of unused Rx GSM ports is not required.

Unused WCDMA ports must be terminated with 50 Ω.

■ Variant 1

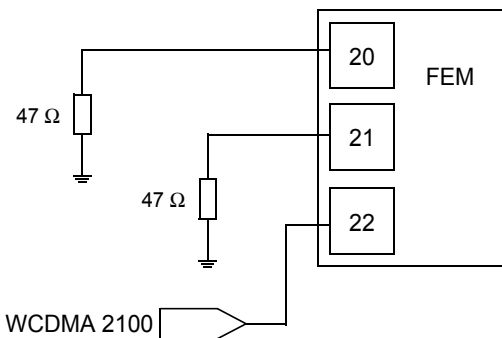


■ Variant 2

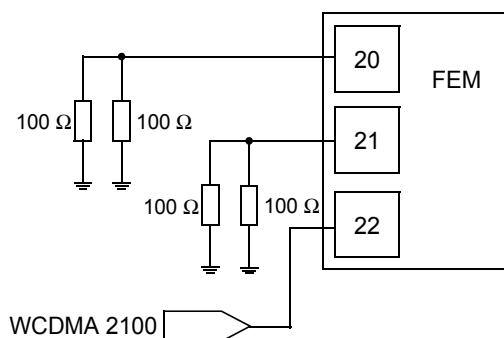


Termination of unused WCDMA ports if WCDMA 1900 port is used for WCDMA 2100 frequencies:

■ Variant 1



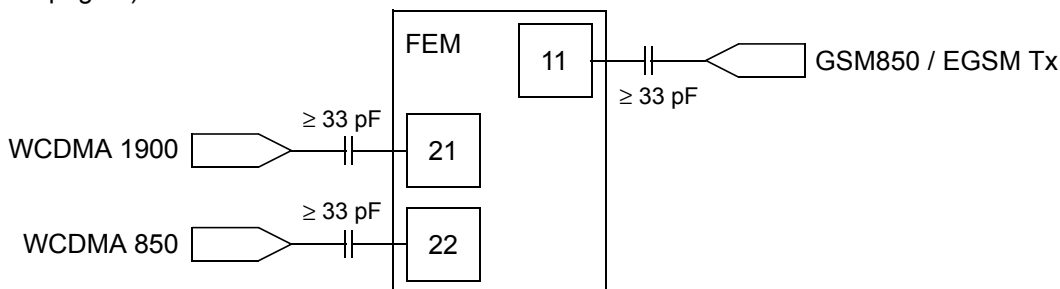
■ Variant 2



2. DC blocking

DC blocking capacitors needed only when non-zero DC voltage is present for the following ports:
GSM850 / EGSM Tx, WCDMA 850, WCDMA 1900

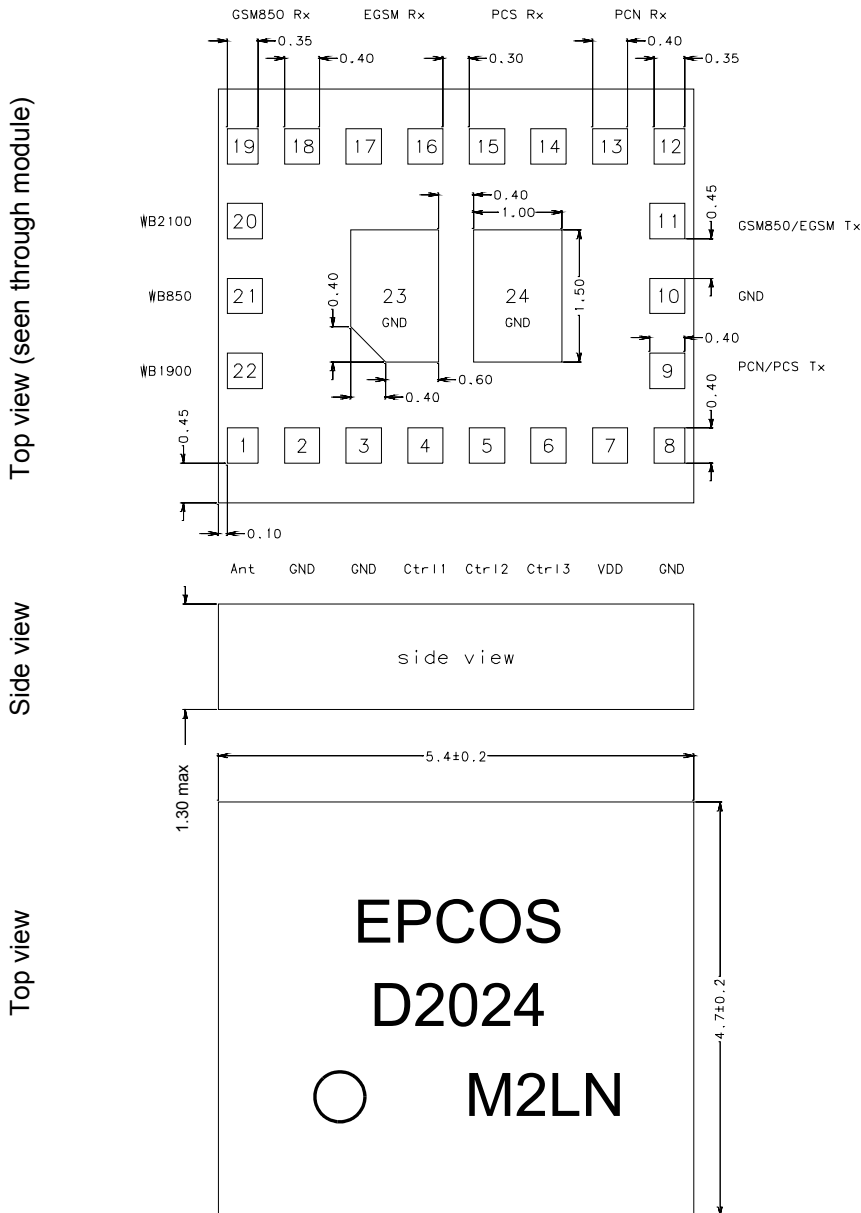
DC blocking capacitors at the Rx GSM ports are not required, except the maximum ratings (please see page 4) are exceeded.



Data Sheet

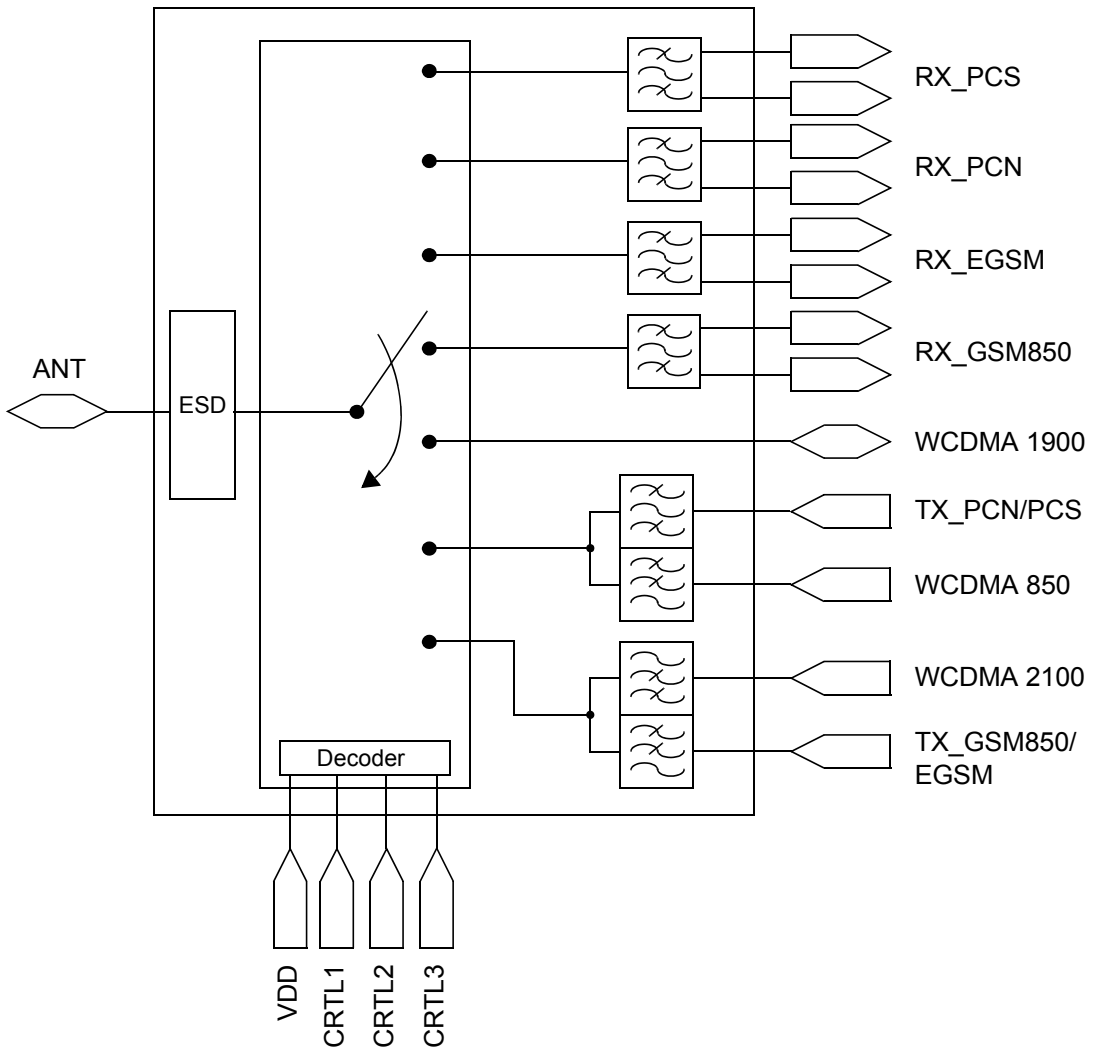
Module pinning and size

Package MC240B



Data Sheet

Block diagram



Data Sheet
Characteristics GSM850/EGSM TX

Operating temperature range: $T = -30 \dots +85 \text{ }^\circ\text{C}$
Terminating source impedance: $Z_I = 50 \text{ } \Omega$
Terminating load impedance: $Z_O = 50 \text{ } \Omega$

				D2024			
				min.	typ. 25 °C	max.	
Passband frequency	f_{TX}	824		824		849	
Insertion loss	IL_{TX}	—		1.45		1.7	dB
Amplitude ripple		—		0.05		0.4	dB
VSWR Antenna	VSWR	—		1.35		1.5	
VSWR Tx	VSWR	—		1.35		1.5	
Passband frequency	f_{TX}	880		880		915	
Insertion loss	IL_{TX}	—		1.45		1.7	dB
Amplitude ripple		—		0.1		0.4	dB
VSWR Antenna	VSWR	—		1.3		1.5	
VSWR Tx	VSWR	—		1.3		1.5	
Attenuation							
$2f_{TX}$	1648 ... 1698 MHz			30	32	—	dB
	1760 ... 1830 MHz			29	31	—	dB
$3f_{TX}$	2472 ... 2547 MHz			25	37	—	dB
	2640 ... 2745 MHz			25	30	—	dB
$4f_{TX}$	3296 ... 3396 MHz			23	38	—	dB
	3520 ... 3660 MHz			23	38	—	dB
Isolation							
GSM850/EGSM Tx -> GSM850 Rx	824 ... 915 MHz			30	48	—	dB
GSM850/EGSM Tx -> EGSM Rx	824 ... 915 MHz			35	60	—	dB
GSM850/EGSM Tx -> PCN Rx	824 ... 915 MHz			35	50	—	dB
	1805 ... 1880 MHz			28	32	—	dB
GSM850/EGSM Tx -> PCS Rx	824 ... 915 MHz			35	55	—	dB
GSM850/EGSM Tx -> WCDMA850	824 ... 915 MHz			23	35	—	dB
GSM850/EGSM Tx -> WCDMA1900	824 ... 915 MHz			23	34	—	dB
GSM850/EGSM Tx -> WCDMA2100	824 ... 915 MHz			23	30	—	dB
PCN/PCS Tx -> Ant	1648 ... 1830 MHz			20	26	—	dB
	2472 ... 2745 MHz			15	20	—	dB
WCDMA2100 -> WCDMA1900	1930 ... 1980 MHz			23	29	—	dB

Data Sheet

	D2024			
	min.	typ. 25 °C	max.	
Harmonic generation $P_{IN} = 35$ dBm antenna port: VSWR Ant 1:1				
$2 \cdot f_{TX}$	—	-50	-38	dBm
$3 \cdot f_{TX}$	—	-45	-38	dBm
$4 \dots 12 \cdot f_{TX}$	—	-70	-38	dBm
Harmonic generation antenna port: VSWR Ant 3:1, $P_{MAX} = 33$ dBm				
$2 \cdot f_{TX}$	—	-50	-30	dBm
$3 \cdot f_{TX}$	—	-45	-30	dBm

Data Sheet
Characteristics PCN/PCS TX

Operating temperature range:	$T = -30 \dots +85 \text{ }^\circ\text{C}$
Terminating source impedance:	$Z_I = 50 \text{ } \Omega$
Terminating load impedance:	$Z_O = 50 \text{ } \Omega$

				D2024			
				min.	typ. 25 °C	max.	
Passband frequency		f_{TX}		1710		1785	
Insertion loss		IL_{TX}		—	1.6	1.8	dB
Amplitude ripple				—	0.1	0.4	dB
VSWR Antenna		VSWR		—	1.1	1.5	
VSWR Tx		VSWR		—	1.2	1.5	
Passband frequency		f_{TX}		1850		1910	
Insertion loss		IL_{TX}		—	1.6	1.8	dB
Amplitude ripple				—	0.1	0.4	dB
VSWR Antenna		VSWR		—	1.1	1.5	
VSWR Tx		VSWR		—	1.2	1.5	
Attenuation							
$2f_{TX}$	3420 ... 3570	MHz		30	33	—	dB
	3700 ... 3820	MHz		29	31	—	dB
$3f_{TX}$	5130 ... 5355	MHz		30	40	—	dB
	5550 ... 5730	MHz		30	45	—	dB
Isolation							
PCN/PCS Tx -> GSM850 Rx	1710 ... 1910	MHz		40	60	—	dB
PCN/PCS Tx -> EGSM Rx	1710 ... 1910	MHz		40	65	—	dB
PCN/PCS Tx -> PCN Rx	1710 ... 1910	MHz		30	38	—	dB
PCN/PCS Tx -> PCS Rx	1710 ... 1910	MHz		35	55	—	dB
PCN/PCS Tx -> WCDMA850	1710 ... 1910	MHz		18	20	—	dB
PCN/PCS Tx -> WCDMA1900	1710 ... 1910	MHz		20	29	—	dB
PCN/PCS Tx -> WCDMA2100	1710 ... 1910	MHz		20	31	—	dB
WCDMA850-> PCN/PCS Tx	824 ... 849	MHz		27	29	—	dB
GSM850/EGSM Tx -> Ant	3420 ... 3820	MHz		20	48	—	dB
	5130 ... 5730	MHz		20	48	—	dB

Data Sheet

	D2024			
	min.	typ. 25 °C	max.	
Harmonic generation $P_{IN} = 33$ dBm antenna port: VSWR Ant 1:1				
$2 \cdot f_{TX}$	—	-50	-38	dBm
$3 \cdot f_{TX}$	—	-50	-38	dBm
$4 \dots 7 \cdot f_{TX}$	—	-70	-38	dBm
Harmonic generation antenna port: VSWR Ant 3:1, $P_{MAX} = 31$ dBm				
$2 \cdot f_{TX}$	—	-48	-30	dBm
$3 \cdot f_{TX}$	—	-48	-30	dBm

Data Sheet
Characteristics WCDMA850

Operating temperature range:	$T = -30 \dots +85 \text{ }^\circ\text{C}$
Terminating source impedance:	$Z_I = 50 \text{ } \Omega$
Terminating load impedance:	$Z_O = 50 \text{ } \Omega$

		D2024			
		min.	typ. 25 °C	max.	
Passband frequency	f_{Tx}	824		849	
Insertion loss	@25 °C IL_{Tx}	—	1.15	1.4	dB
Insertion loss				1.5	dB
Amplitude ripple		—	0.1	0.4	dB
VSWR Antenna	VSWR	—	1.1	1.5	
VSWR Tx	VSWR	—	1.1	1.5	
Passband frequency	f_{Rx}	869		894	
Insertion loss	@25 °C IL_{Rx}	—	1.2	1.4	dB
Insertion loss				1.5	dB
Amplitude ripple		—	0.1	0.4	dB
VSWR Antenna	VSWR	—	1.1	1.5	
VSWR Tx	VSWR	—	1.1	1.5	
Intermodulation					
$P_{IM3-WCDMA850-Rx}$ at 869 ... 894 MHz $P_{WCDMA} = +20 \text{ dBm}$ at 824 ... 849 MHz $P_{CW-Ant} = -15 \text{ dBm}$ at 779 ... 804 MHz at worst case phase angle at WCDMA port	P_{IM3}	—	-107	-100	dBm
$P_{IM2-WCDMA850-Rx}$ at 869 ... 894 MHz $P_{WCDMA} = +20 \text{ dBm}$ at 824 ... 849 MHz $P_{CW-Ant} = -15 \text{ dBm}$ at 1693 ... 1743 MHz $P_{CW-Ant} = -15 \text{ dBm}$ at 45 MHz at worst case phase angle at WCDMA port	P_{IM2}	—	-112	-100	dBm
Harmonic generation $P_{IN} = 27 \text{ dBm}$					
$2 \cdot f_{Tx}$		—	-64	-40	dBm
$3 \cdot f_{Tx}$		—	-66	-40	dBm
$4 \dots 7 \cdot f_{Tx}$		—	-70	-40	dBm

Data Sheet
Characteristics WCDMA1900

Operating temperature range:	$T = -30 \dots +85 \text{ }^{\circ}\text{C}$
Terminating source impedance:	$Z_I = 50 \text{ } \Omega$
Terminating load impedance:	$Z_O = 50 \text{ } \Omega$

		D2024				
		min.	typ. @25 °C	max.		
Passband frequency	f_{Tx}	1850		1910		
Insertion loss	IL_{Tx}	—	0.95	1.2	dB	
Insertion loss				1.3	dB	
Amplitude ripple			0.1	0.4	dB	
VSWR Antenna	VSWR	—	1.2	1.5		
VSWR Tx	VSWR	—	1.2	1.5		
Passband frequency	f_{Rx}	1930		1990		
Insertion loss	IL_{Rx}	—	0.95	1.2	dB	
Insertion loss				1.3	dB	
Amplitude ripple			0.1	0.4	dB	
VSWR Antenna	VSWR	—	1.2	1.5		
VSWR Tx	VSWR	—	1.2	1.5		
Isolation						
WCDMA2100 -> WCDMA1900						
	1930 ... 1990 MHz	20	25	—	dB	
WCDMA1900 -> PCN Rx						
	1850 ... 1880 MHz	23	38	—	dB	
Intermodulation						
$P_{IM3-WCDMA1900-Rx}$	at 1930 ... 1990 MHz	P_{IM3}	—	-110	-100	dBm
P_{WCDMA}	= +20 dBm at 1850 ... 1910 MHz					
P_{CW-Ant}	= -15 dBm at 1770 ... 1830 MHz					
at worst case phase angle at WCDMA port						
$P_{IM2-WCDMA1900-Rx}$	at 1930 ... 1990 MHz	P_{IM2}	—	-115	-100	dBm
P_{WCDMA}	= +20 dBm at 1850 ... 1910 MHz					
P_{CW-Ant}	= -15 dBm at 80 MHz					
at worst case phase angle at WCDMA port						
Harmonic generation $P_{IN} = 27 \text{ dBm}$						
	$2 \cdot f_{Tx}$	—	-57	-40	dBm	
	$3 \cdot f_{Tx}$	—	-68	-40	dBm	
	$4 \dots 7 \cdot f_{Tx}$	—	-70	-40	dBm	

Data Sheet
Characteristics WCDMA1900 port at WCDMA2100 frequencies

Operating temperature range:	$T = -30 \dots +85 \text{ °C}$
Terminating source impedance:	$Z_I = 50 \text{ } \Omega$
Terminating load impedance:	$Z_O = 50 \text{ } \Omega$

			D2024			
			min.	typ. 25 °C	max.	
Passband frequency		f_{Tx}	1920		1980	
Insertion loss	@ 25 °C	IL_{Tx}	—	1.0	1.3	dB
Insertion loss					1.4	dB
Amplitude ripple			—	0.1	0.4	dB
VSWR Antenna		VSWR	—	1.2	1.5	
VSWR Tx		VSWR	—	1.2	1.5	
Passband frequency		f_{Rx}	2110		2170	
Insertion loss	@ 25 °C	IL_{Rx}	—	1.0	1.3	dB
Insertion loss					1.4	dB
Amplitude ripple			—	0.1	0.4	dB
VSWR Antenna		VSWR	—	1.2	1.5	
VSWR Tx		VSWR	—	1.2	1.5	
Intermodulation						
$P_{IM3-WCDMA2100-Rx}$ at 2110 ... 2170 MHz $P_{WCDMA} = +20 \text{ dBm}$ at 1920 ... 1980 MHz $P_{CW-Ant} = -15 \text{ dBm}$ at 1730 ... 1790 MHz at worst case phase angle at WCDMA port		P_{IM3}	—	-110	-100	dBm
$P_{IM2-WCDMA2100-Rx}$ at 2110 ... 2170 MHz $P_{WCDMA} = +20 \text{ dBm}$ at 1920 ... 1980 MHz $P_{CW-Ant} = -15 \text{ dBm}$ at 190 MHz at worst case phase angle at WCDMA port		P_{IM2}	—	-115	-100	dBm
Harmonic generation $P_{IN} = 27 \text{ dBm}$						
$2 \cdot f_{Tx}$			—	-57	-40	dBm
$3 \cdot f_{Tx}$			—	-68	-40	dBm
$4 \dots 7 \cdot f_{Tx}$			—	-70	-40	dBm

Data Sheet
Characteristics WCDMA2100

Operating temperature range:	$T = -30 \dots +85^{\circ}\text{C}$
Terminating source impedance:	$Z_I = 50 \Omega$
Terminating load impedance:	$Z_O = 50 \Omega$

			D2024			
			min.	typ. 25 °C	max.	
Passband frequency		f_{Tx}	1920		1980	
Insertion loss	@25 °C	IL_{Tx}	—	1.5	1.7	dB
Insertion loss					1.75	dB
Amplitude ripple			—	0.1	0.4	dB
VSWR Antenna		VSWR	—	1.25	1.5	
VSWR Tx		VSWR	—	1.2	1.5	
Passband frequency		f_{Rx}	2110		2170	
Insertion loss	@25 °C	IL_{Rx}	—	1.6	1.8	dB
Insertion loss					1.85	dB
Amplitude ripple			—	0.1	0.4	dB
VSWR Antenna		VSWR	—	1.25	1.5	
VSWR Tx		VSWR	—	1.3	1.5	
Intermodulation						
$P_{IM3-WCDMA2100-Rx}$ at 2110 ... 2170 MHz		P_{IM3}	—	-110	-100	dBm
$P_{WCDMA} = +20$ dBm at 1920 ... 1980 MHz						
$P_{CW-Ant} = -15$ dBm at 1730 ... 1790 MHz						
at worst case phase angle at WCDMA port						
$P_{IM2-WCDMA2100-Rx}$ at 2110 ... 2170 MHz		P_{IM2}	—	-115	-100	dBm
$P_{WCDMA} = +20$ dBm at 1920 ... 1980 MHz						
$P_{CW-Ant} = -15$ dBm at 190 MHz						
at worst case phase angle at WCDMA port						
Harmonic generation $P_{IN} = 27$ dBm						
$2 \cdot f_{Tx}$			—	-70	-40	dBm
$3 \cdot f_{Tx}$			—	-70	-40	dBm
$4 \dots 7 \cdot f_{Tx}$			—	-70	-40	dBm

Data Sheet
Characteristics GSM850 RX

Operating temperature range: $T = -30 \dots +85 \text{ }^\circ\text{C}$
 Terminating source impedance: $Z_I = 50 \text{ } \Omega$
 Terminating load impedance: $Z_O = 150 \text{ } \Omega \parallel 47 \text{ nH}$

				D2024			
				min.	typ. @25 °C	max.	
Passband frequency			f_{Rx}	869		894	
Insertion loss		@25 °C	IL_{Rx}	—	2.15	3.3	dB
Insertion loss		@ -10 °C ... +85 °C		—	2.5	3.6	dB
Insertion loss		@ -30 °C ... +85 °C		—	2.6	3.6	dB
Amplitude ripple				—	1.0	1.5	dB
Amplitude imbalance		(S_{31}/S_{21})		—	± 0.5	± 1.5	dB
Phase imbalance		$\phi(S_{31}) - \phi(S_{21}) - 180^\circ$		—	± 6	± 10	deg
VSWR Antenna			VSWR	—	1.6	2.3	
VSWR Rx			VSWR	—	1.6	2.3	
Attenuation	0 ... 824 MHz			30	35	—	dB
	824 ... 849 MHz			30	40	—	dB
	914 ... 1000 MHz			23	30	—	dB
	1000 ... 1738 MHz			30	36	—	dB
	1738 ... 1788 MHz			35	45	—	dB
	1788 ... 2400 MHz			30	45	—	dB
	2400 ... 2500 MHz			35	48	—	dB
	2500 ... 2607 MHz			30	48	—	dB
	2607 ... 2682 MHz			35	42	—	dB
	2682 ... 4345 MHz			30	44	—	dB
	4345 ... 4470 MHz			35	44	—	dB
	4470 ... 6000 MHz			30	44	—	dB
Isolation							
GSM850/EGSM Tx -> Ant							
	824 ... 849 MHz			20	38	—	dB

Data Sheet
Characteristics EGSM RX

Operating temperature range:	$T = -30 \dots +85 \text{ }^\circ\text{C}$
Terminating source impedance:	$Z_I = 50 \text{ } \Omega$
Terminating load impedance:	$Z_O = 150 \text{ } \Omega \parallel 47 \text{ nH}$

				D2024			
				min.	typ. @25 °C	max.	
Passband frequency			f_{RX}	925		960	
Insertion loss		@25 °C	IL_{RX}	—	2.55	3.3	dB
Insertion loss		@ -10 °C ... +85 °C		—	2.9	3.6	dB
Insertion loss		@ -30 °C ... +85 °C		—	3.0	3.6	dB
Amplitude ripple				—	1.0	1.5	dB
Amplitude imbalance	(S_{31}/S_{21})			—	± 0.7	± 1.5	dB
Phase imbalance	$\phi(S_{31}) - \phi(S_{21}) - 180^\circ$			—	± 3	± 10	deg
VSWR Antenna			VSWR	—	1.7	2.3	
VSWR Rx			VSWR	—	1.8	2.3	
Attenuation	0 ...	880 MHz		30	35	—	dB
	880 ...	905 MHz		30	34	—	dB
	905 ...	915 MHz		18	28	—	dB
	980 ...	1020 MHz		25	31	—	dB
	1020 ...	1850 MHz		30	36	—	dB
	1850 ...	1920 MHz		35	45	—	dB
	1920 ...	2400 MHz		30	45	—	dB
	2400 ...	2500 MHz		35	44	—	dB
	2500 ...	2775 MHz		30	43	—	dB
	2775 ...	2880 MHz		35	45	—	dB
	2880 ...	4625 MHz		30	45	—	dB
	4625 ...	4800 MHz		40	46	—	dB
	4800 ...	6000 MHz		30	46	—	dB
Isolation							
GSM850/EGSM Tx -> Ant	880 ...	915 MHz		20	35	—	dB

Data Sheet
Characteristics PCN RX

Operating temperature range: $T = -30 \dots +85 \text{ }^\circ\text{C}$
Terminating source impedance: $Z_I = 50 \text{ } \Omega$
Terminating load impedance: $Z_O = 180 \text{ } \Omega \parallel 15 \text{ nH}$

				D2024			
				min.	typ. @25 °C	max.	
Passband frequency			f_{Rx}	1805		1880	
Insertion loss		@25 °C	IL_{Rx}	—	3.0	3.6	dB
Insertion loss		@ -10 °C ... +85 °C			3.3	3.8	dB
Insertion loss		@ -30 °C ... +85 °C			3.5	4.1	dB
Amplitude ripple				—	1.0	1.5	dB
Amplitude imbalance		(S_{31}/S_{21})		—	± 0.8	± 1.5	dB
Phase imbalance		$\phi(S_{31}) - \phi(S_{21}) - 180^\circ$		—	± 5	± 10	deg
VSWR Antenna			VSWR	—	1.8	2.3	
VSWR Rx			VSWR	—	1.7	2.3	
Attenuation	0 ... 1705 MHz			30	38	—	dB
	1705 ... 1785 MHz			12	18	—	dB
	1920 ... 1980 MHz			14	21	—	dB
	1980 ... 2100 MHz			23	30	—	dB
	2100 ... 2400 MHz			30	35	—	dB
	2400 ... 2500 MHz			30	35	—	dB
	2500 ... 3610 MHz			30	34	—	dB
	3610 ... 3760 MHz			40	55	—	dB
	3760 ... 5415 MHz			30	55	—	dB
	5415 ... 5640 MHz			40	60	—	dB
	5640 ... 6000 MHz			30	55	—	dB
Isolation							
PCN/PCS Tx -> Ant	1710 ... 1785 MHz			20	23	—	dB

Data Sheet
Characteristics PCS RX

Operating temperature range: $T = -30 \dots +85 \text{ }^\circ\text{C}$
 Terminating source impedance: $Z_I = 50 \text{ } \Omega$
 Terminating load impedance: $Z_O = 180 \text{ } \Omega \parallel 12 \text{ nH}$

				D2024			
				min.	typ. @25 °C	max.	
Passband frequency			f_{RX}	1930		1990	
Insertion loss		@25 °C	IL_{RX}	—	2.8	3.6	dB
Insertion loss		@ -10 °C ... +85 °C			3.3	3.8	dB
Insertion loss		@ -30 °C ... +85 °C			3.5	4.1	dB
Amplitude ripple				—	1.0	1.5	dB
Amplitude imbalance	(S_{31}/S_{21})			—	± 0.7	± 1.5	dB
Phase imbalance	$\phi(S_{31}) - \phi(S_{21}) - 180^\circ$			—	± 4	± 10	deg
VSWR Antenna			VSWR	—	1.5	2.3	
VSWR Rx			VSWR	—	1.5	2.3	
Attenuation	0 ... 1830 MHz			30	38	—	dB
	1830 ... 1910 MHz			10	18	—	dB
	2010 ... 2070 MHz			10	16	—	dB
	2070 ... 2100 MHz			20	26	—	dB
	2100 ... 2400 MHz			25	30	—	dB
	2400 ... 2500 MHz			35	45	—	dB
	2500 ... 3860 MHz			30	36	—	dB
	3860 ... 3980 MHz			40	55	—	dB
	3980 ... 5790 MHz			30	54	—	dB
	5790 ... 5970 MHz			40	55	—	dB
	5970 ... 6000 MHz			30	57	—	dB
Isolation							
PCN/PCS Tx -> Ant	1850 ... 1910 MHz			20	23	—	dB

Data Sheet

Notes

Type	D2024
Ordering code	B30674-D2024-R424
Marking, package and recommended pad layout	C61157-A4-A41
Packaging	F61074-V8216-Z000
Date codes	L_1126
S-parameters	
Soldering profile	S_6001

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Data Sheet

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