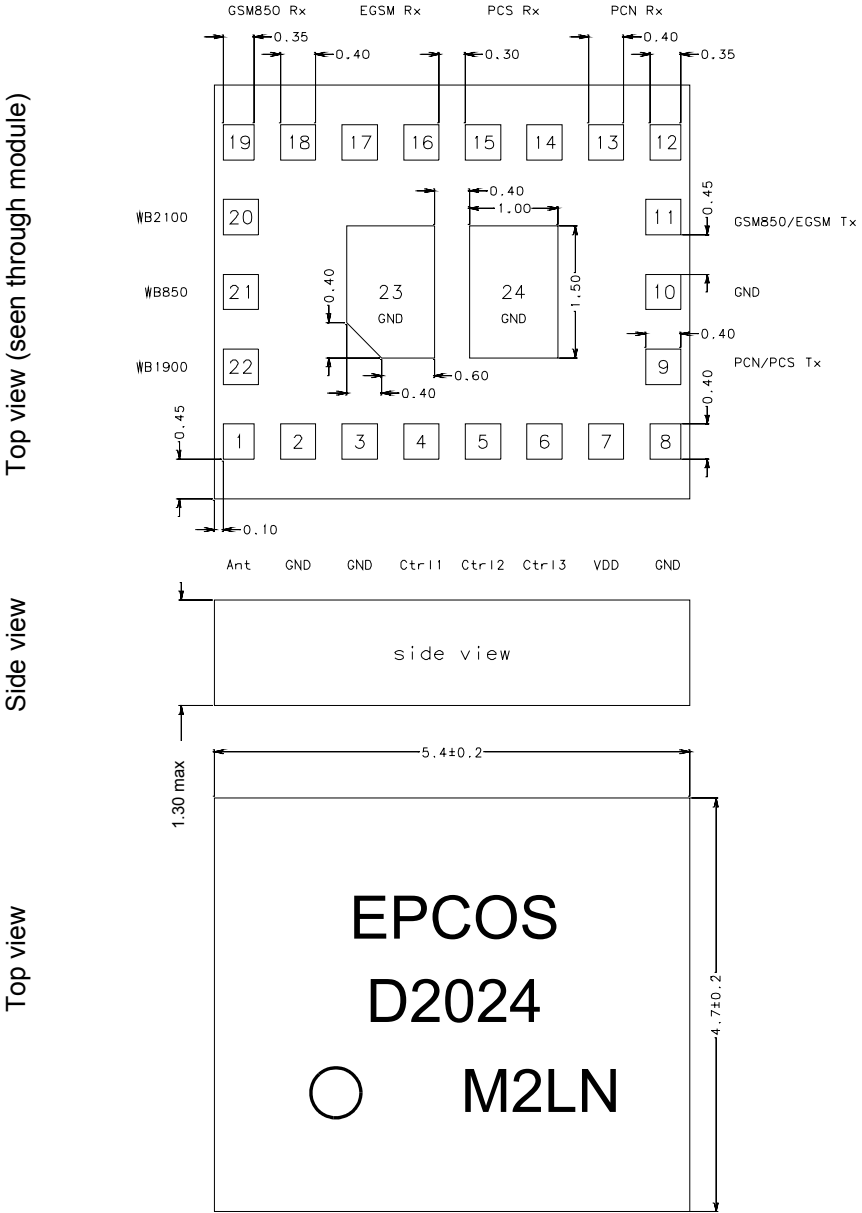


Data Sheet

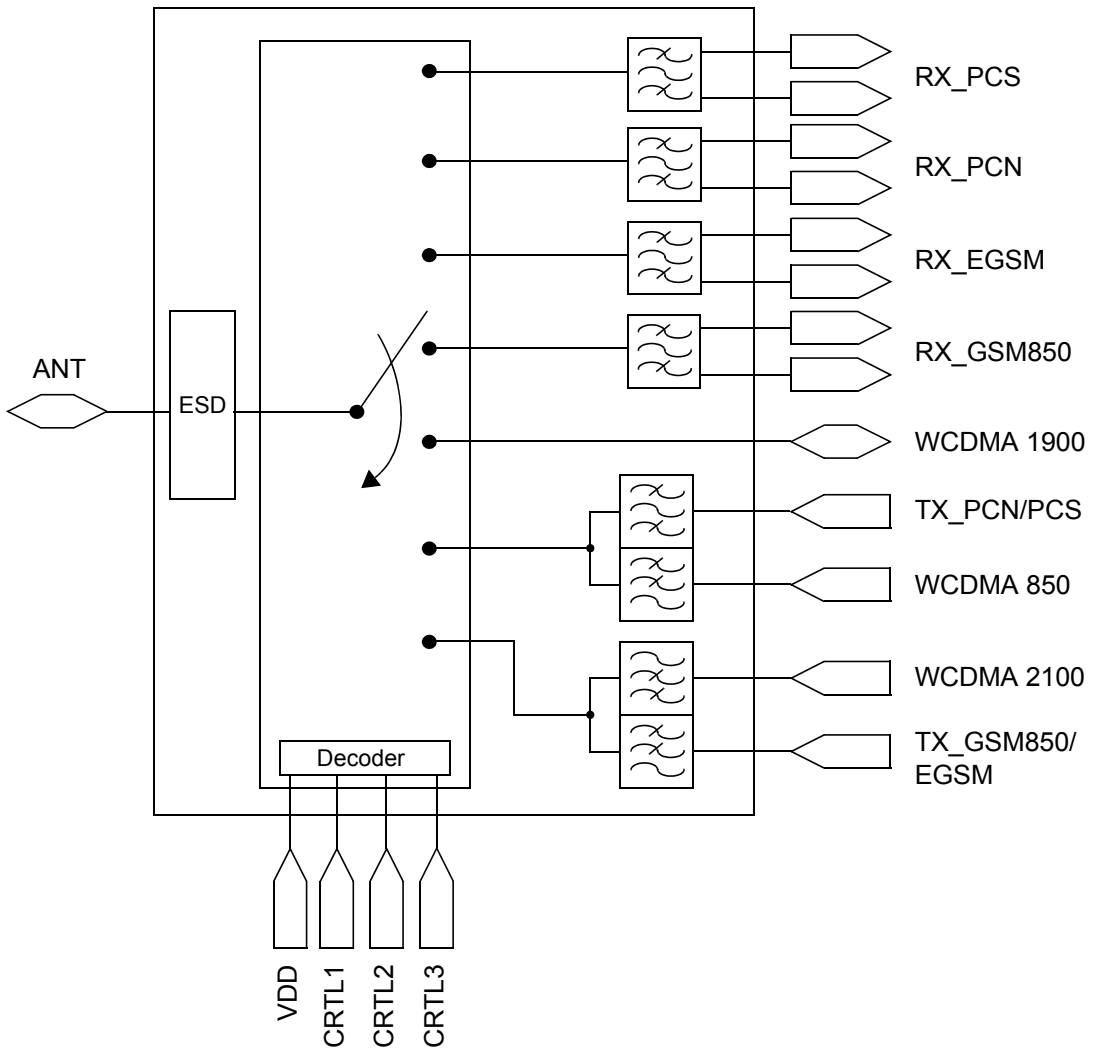
Module pinning and size

Package MC240B



Data Sheet

Block diagram



Data Sheet
Characteristics GSM850/EGSM TX

Operating temperature range:	T = -30 ... +85 °C
Terminating source impedance:	Z _I = 50 Ω
Terminating load impedance:	Z _O = 50 Ω

		D2024			
		min.	typ. 25 °C	max.	
Passband frequency	f _{TX}	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		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_{IM3}	—	-107	-100	dBm
P_{WCDMA}	= +20 dBm at 824 ... 849 MHz					
P_{CW-Ant}	= -15 dBm at 779 ... 804 MHz					
at worst case phase angle at WCDMA port						
$P_{IM2-WCDMA850-Rx}$	at 869 ... 894 MHz	P_{IM2}	—	-112	-100	dBm
P_{WCDMA}	= +20 dBm at 824 ... 849 MHz					
P_{CW-Ant}	= -15 dBm at 1693 ... 1743 MHz					
P_{CW-Ant}	= -15 dBm at 45 MHz					
at worst case phase angle at WCDMA port						
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	@25 °C 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	@25 °C 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 $P_{WCDMA} = +20 \text{ dBm}$ at 1850 ... 1910 MHz $P_{CW-Ant} = -15 \text{ dBm}$ at 1770 ... 1830 MHz at worst case phase angle at WCDMA port		P_{IM3}	—	-110	-100	dBm
$P_{IM2-WCDMA1900-Rx}$ at 1930 ... 1990 MHz $P_{WCDMA} = +20 \text{ dBm}$ at 1850 ... 1910 MHz $P_{CW-Ant} = -15 \text{ dBm}$ at 80 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 WCDMA1900 port at WCDMA2100 frequencies

Operating temperature range:	$T = -30 \dots +85 \text{ }^\circ\text{C}$
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}	—	1.0	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_{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						
$2 \cdot f_{Tx}$			—	-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 $P_{WCDMA} = +20$ dBm at 1920 ... 1980 MHz $P_{CW-Ant} = -15$ dBm at 1730 ... 1790 MHz at worst case phase angle at WCDMA port		P_{IM3}	—	-110	-100	dBm
$P_{IM2-WCDMA2100-Rx}$ at 2110 ... 2170 MHz $P_{WCDMA} = +20$ dBm at 1920 ... 1980 MHz $P_{CW-Ant} = -15$ dBm at 190 MHz at worst case phase angle at WCDMA port		P_{IM2}	—	-115	-100	dBm
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:	$T = -30 \dots +85 \text{ °C}$
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:	$T = -30 \dots +85 \text{ °C}$
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
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