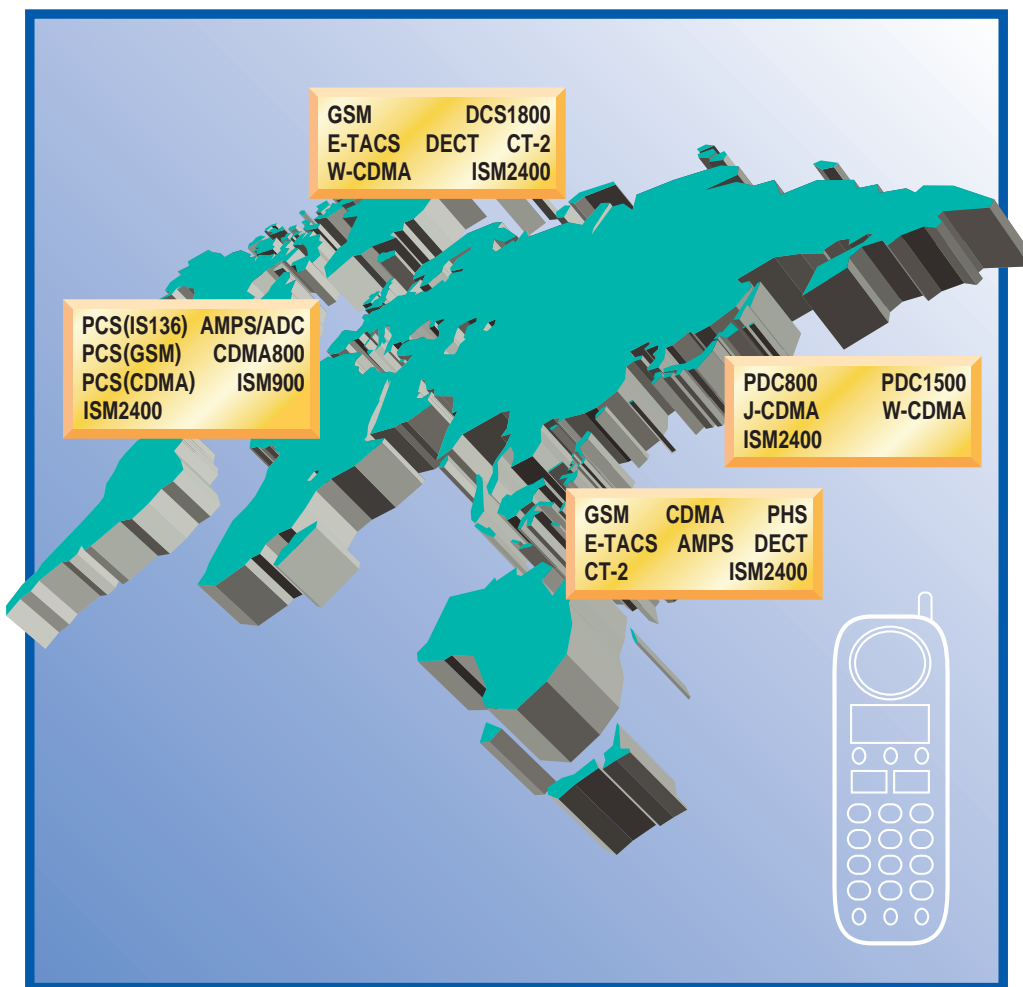







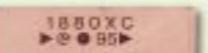
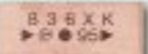
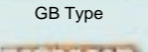




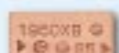










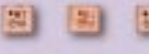
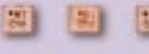
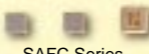

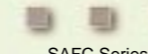
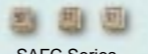
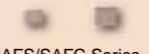
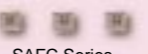
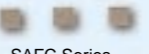
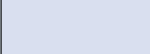
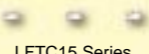
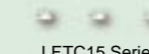
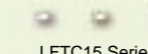
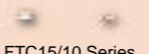
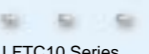
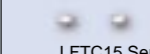
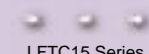
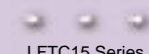


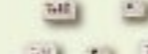





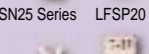
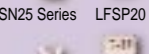








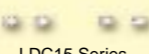
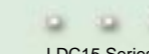
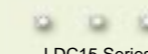
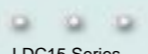
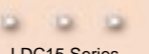
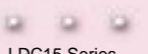
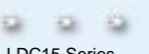
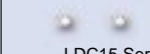
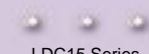
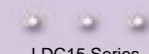





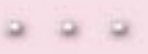




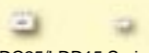
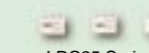
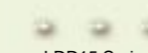
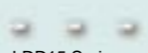
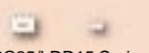
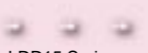

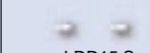








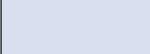


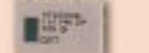
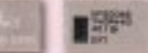
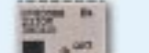





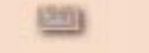
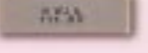






Murata Products for Mobile Communications



Innovator in Electronics



Meet the Needs Around the World

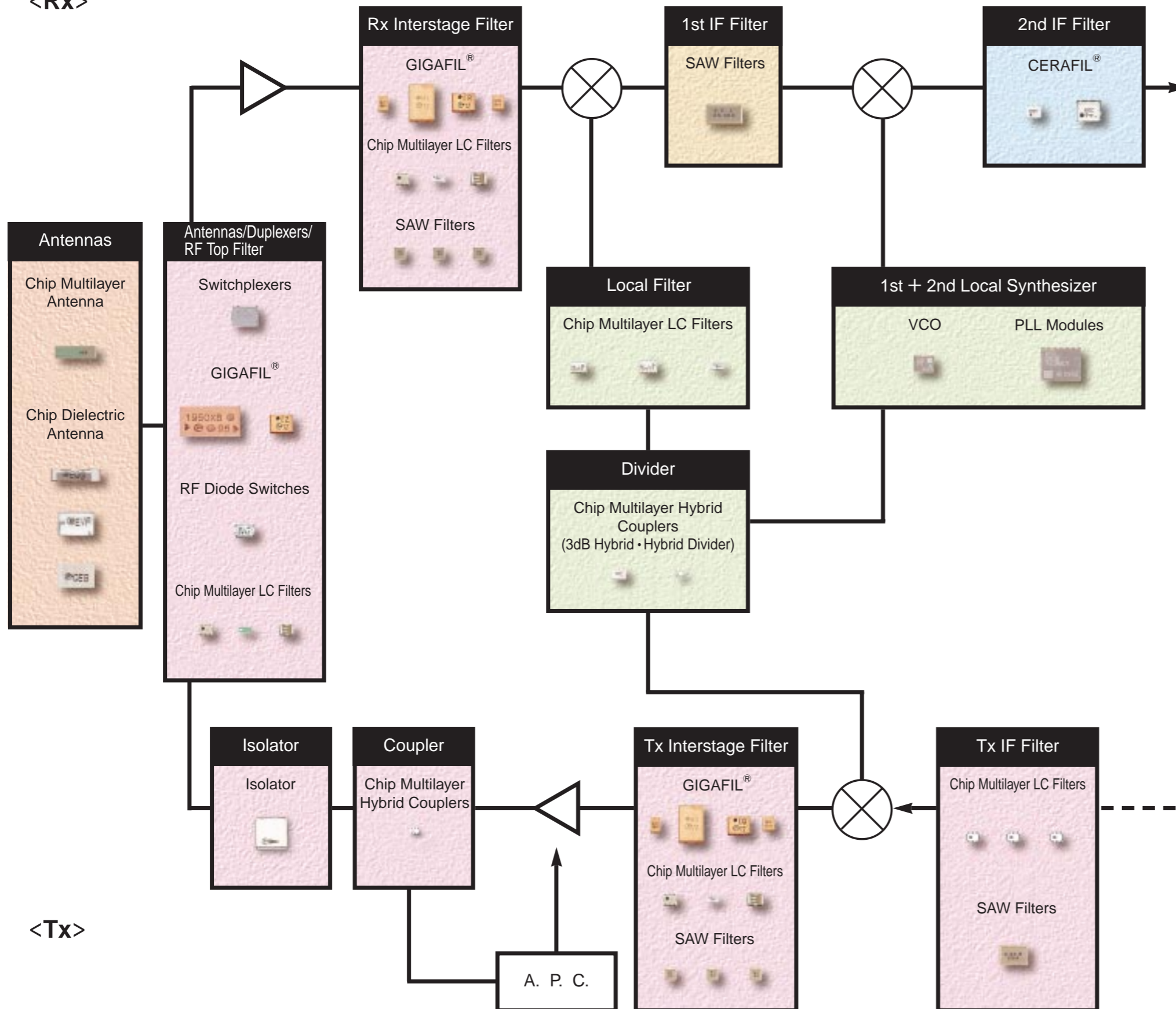
System		GSM/DCS Dual Band	GSM	PCS (CDMA1900)	AMPS/ADC	PDC800/1500	J-CDMA	W-CDMA	DECT	ISM2400	
Area		Europe, Asia	Europe, Asia	U.S.A.	U.S.A.	Japan	Japan	Japan, Europe	Europe, Hong Kong	Global	
Channel Multiplexing Method		TDMA/FDD	TDMA/FDD	CDMA/FDD	CDMA/FDD, TDMA/FDD, FDMA/FDD	TDMA/FDD	CDMA/FDD	CDMA/FDD	TDMA/TDD	SS/TDD	
Frequency (MHz)		Tx Rx	890-915 935-960	1850-1910 1930-1990	824-849 869-894	940-960/1429-1453 810-830/1477-1501	887-925 832-870	1920-1980 2110-2170	1880-1900	Europe, U.S.A.:2400-2483.5* Japan:2471-2497	
RF	Switchplexers/ RF Diode Switches/ GIGAFIL® (Duplexers)/ Chip Multilayer Diplexers	LMC36-07A05 Series  DP Series  LFDP15 Series 	LMS30 Series  KB Type 	1880XC 	836XK  GB Type  DP Series 	LMS36A Series  DP Series 	 DP Series (Siftable Type)	 KB Type	LMS33L Series 	LMS30C Series 	
	GIGAFIL® (BPF)	MB Series 	MB Series  DP Series  (BEF)	MB Series 	MB Series 	MB Series 	MB Series 	MB Series 	MB Series 	MB Series 	
	SAW Filters	SAFC Series 	SAFC Series 	SAFC Series 	SAFC Series 	SAFS/SAFC Series 	SAFC Series 	SAFC Series 	SAFC Series 		
	Chip Multilayer LC Filters (LPF)	LFTC15 Series 	LFTC15 Series 	LFTC15 Series 		LFTC15/10 Series 		LFTC10 Series 	LFTC15 Series 	LFTC15 Series 	LFTC15 Series 
	Chip Multilayer LC Filters (BPF)	LFSA25/LFSN25 Series 	LFSA25 Series 	LFSN25/30 Series 	LFSA25 Series 	LFSC25/LFSA25 Series 	LFSA25 Series 	LFSG20 Series LFSN20 Series 	LFSE25 Series LFSN20 Series 	LFSN25 Series LFSN20 Series 	LFSG20 Series LFSN20 Series 
	Isolators/Circulators	CE073 Series 	CE073 Series 	CE053 Series 	CE053/052 Series 	CE053/052 Series 	CE052 Series 	CE052 Series 	CE073 Series CE07A Series 		
	Chip Multilayer Hybrid Couplers (Directional Couplers)	LDC15 Series 	LDC15 Series 	LDC15 Series 	LDC15 Series 	LDC15 Series 	LDC15 Series 	LDC15 Series 	LDC15 Series 	LDC15 Series 	LDC15 Series 
	Chip Multilayer Hybrid Baluns/ Chip Multilayer Dual Baluns	LDB15/25 Series 	LDB15 Series 	LDB15 Series 	LDB15 Series 	LDB15 Series 	LDB15 Series 	LDB15 Series 	LDB15 Series 	LDB15 Series 	LDB15 Series 
Mixer	Chip Multilayer Hybrid Couplers (3dB Hybrid · Hybrid Divider)	LDC25/LDD15 Series 	LDC25 Series 	LDD15 Series 	LDD15 Series 	LDC25/LDD15 Series 	LDD15 Series 	LDD15 Series 	LDD15 Series 	LDD15 Series 	
	Microwave Oscillators (VCOs)	MQW Series 	MQE9 Series 	MQK Series 	MQK/MQE9 Series 	MQL Series 	MQL Series 	MQL Series 	MQL Series 		
	PLL Modules (HFQ~)/ TCXO (HFQ~)			HFQC Series 	HFQC Series 	HFQD Series 	HFQC/HFQD Series 	HFQD Series 		HFQS Series 	
1st IF	SAW Filters	SAFC Series 	SAFC Series 	SAFC Series 	SAFC Series 	SAFC Series 	SAFC Series 	SAFC Series 	SAFU Series 		
2nd IF	CERAFIL®	CFSJC Series CFECS Series 	CFSJC Series CFECS Series 		CFUXC Series 	CFUXC Series 					

Actual Size : The sample units and data in this catalog are only reference, which contains some provisional specifications.

* except France, Spain

Murata's High Functional, down-sizing technology supports RF to IF Designing

<Rx>



<Tx>

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TOPICS

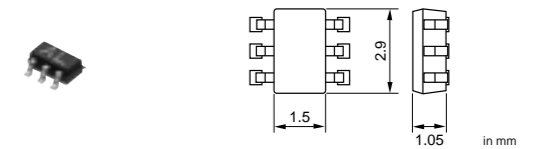
GaAs MMIC

XM2400LB-PM0601 ; LNA for ISM2400. Very small mount area is realized by the internal input/output matching circuit.

XM1900PA-PT2401 ; RF front-end MMIC for 1.9GHz band wireless communication. PA, LNA, and SW are integrated in one package.

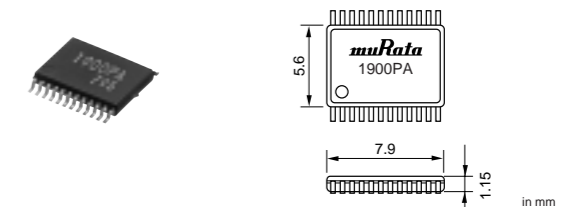
ALL the ICs operate by 3V single voltage supply, and operate in low current consumption.

XM2400LB-PM0601



Operation Frequency	2400-2500MHz
Current Consumption	4.5mA (Typ.)
Noise Figure	1.9dB (Typ.)
Small Signal Gain	15.5dB (Typ.)

XM1900PA-PT2401



Operation Frequency	1895-1918MHz
1dB Compression Point (PA)	20.5dBm (Typ.)
Power Gain (PA)	36dB (Typ.)
Noise Figure (LNA)	2.0dB (Typ.)
Insertion Loss (SW; Tx, Rx)	0.7dB (Typ.)

for GSM/DCS Dual Band (TDMA/FDD) Tx/GSM:890-915MHz, DCS1800:1710-1785MHz, Rx/GSM:935-960MHz, DCS1800:1805-1880MHz

RF / LO

Block	Products	Parts Numbers	Center Frequency F ₀ (MHz)	Band Width (MHz)	Insertion Loss (dB max.)	Ripple (dB max.)	VSWR (max.)	Attenuation (dB min.) () (MHz)	Size (mm) / Others		
Antennas/ Duplexers	GIGAFIL®	DFYJR897C1R84LHA	897.5	F _{T1} ±17.5	0.8 (0 to +35°C) 0.9 (-35 to +85°C)	0.3	1.7	15 (2×F _{T1}) 20 (3×F _{T1})	11×11×2.5		
			942.5	F _{R1} ±17.5	1.2 (0 to +35°C) 1.3 (-35 to +85°C)	0.3	2.0	—			
			1747.5	F _{T2} ±37.5	1.3 (0 to +35°C) 1.4 (-35 to +85°C)	0.3	1.7	30 (2×F _{T2}) 30 (3×F _{T2})			
			1842.5	F _{R2} ±37.5	3.2 (0 to +35°C) 3.6 (-35 to +85°C)	1.2	2.0	15 (1388-1742) 10 (1942-2000)			
	Multilayer Duplexers	LFDP15N0044A	1795.0 (F ₁)	F ₁ ±85.0	0.55	—	1.8	20.0 (F ₂) 16.0 (F ₁)	2.0×1.25×1.05 max. Power Capacity:3.0W		
			920.0 (F ₂)	F ₂ ±40.0	0.50	—					
	Switchplexers	LMC36-07A0505A	GSM Band	897.5	F _T ±17.5	1.2	—	2.0	25.0 (2×F _T) 25.0 (3×F _T)	6.7×5.0×2.0 max. Isolation:20.0dB min. Power Capacity: GSM Band: 35dBm DCS Band: 33dBm	
			942.5	F _R ±17.5	1.0	—					
			DCS Band	1747.5	F _T ±37.5	1.5	—	2.0	25.0 (2×F _T) 25.0 (3×F _T)		
			1842.5	F _R ±37.5	1.2	—					
Filters (Tx)	GIGAFIL®	DFC31R74P075LHA	1747.5	F ₀ ±37.5	3.5	2.0	3.0	5 (F ₀ ±57.5)	5.7×4.6×2		
			Multilayer LC Filters	LFTC15N19E0902B	902.5	F ₀ ±12.5	0.6	—	1.5	30.0 (2× (F ₀ ±12.5)) 30.0 (3× (F ₀ ±12.5))	2.0×1.25×1.05 max. Impedance:50Ω(Nominal) Power Capacity:3.0W
				LFA25-12B0902B	902.5	F ₀ ±12.5	3.0	1.0	2.2	15.0 (802-827) 15.0 (978-1003)	3.2×2.5×1.9 max. Impedance:50Ω(Nominal) Power Capacity:500mW
				LFSN25N15C1747B	1747.5	F ₀ ±37.5	2.5	1.0	2.2	20.0 (DC-1350) 30.0 (1350-1425) 25.0 (2300-5000)	3.2×2.5×1.6 max. Impedance:50Ω(Nominal) Power Capacity:500mW
Filters (Rx)	GIGAFIL®	DFC31R84P075LHA	1842.5	F ₀ ±37.5	3.5	2.0	3.0	5 (F ₀ ±57.5)	5.7×4.6×2		
			DFC31R84P075LHB	1842.5	F ₀ ±37.5	2.5 (0 to +35°C) 2.75 (-35 to +85°C)	1.0	2.0	15 (1338-1742) 10 (1942-2000)	5.7×4.6×2	
	Multilayer LC Filters	LFSA25-12B0947B	947.5	F ₀ ±12.5	3.0	1.3	2.2	9.0 (0.3-835) 8.0 (1000-1394) 11.0 (1394-1805) 14.0 (1805-1880)	3.2×2.5×1.9 max. Impedance:50Ω(Nominal) Power Capacity:500mW		
			LFSN25N18C1842B	1842.5	F ₀ ±37.5	2.5	1.0	2.0	52 (0-600) 52 (1375-1450) 37 (2905-1315)	3.2×2.5×1.6 max. Impedance:50Ω(Nominal) Power Capacity:500mW	
	SAW Filters	SAFC942.5T1842.5ML80T	942.5	F ₀ ±17.5	3.7	2.5	2.7	7 (905-915)	3.8×3.8×1.5 max. Input Output Impedance: 50Ω		
			1842.5	F ₀ ±37.5	4.2	2.5	2.7	7 (1705-1785)			

Block	Products	Parts Numbers	Center Frequency F ₀ (MHz)	Band Width (MHz)	Insertion Loss (dB max.)	VSWR (max.)	Size (mm) / Others
Couplers	Hybrid Couplers	LDC15B200J0897	897.5	F ₀ ±17.5	0.16	1.4	2.0×1.25×1.05 max. Coupling:20.0dB±1.0
		LDC15B120J1747	1747.5	F ₀ ±37.5	0.50	1.4	2.0×1.25×1.05 max. Coupling:12.8dB±1.0
	Couplers with Integrated LPF	LDC15H200J1747	1747.5	F ₀ ±37.5	0.45	1.4	2.0×1.25×1.05 max. Coupling:20.0dB±1.0 Attenuation:22.0dB min. (2×(F ₀ ±37.5)MHz), 17.0dB min. (3×(F ₀ ±37.5)MHz)
Baluns	Hybrid Baluns	LDB15C500A0942	942.5	F ₀ ±17.5	1.4	2.0	2.0×1.25×1.05 max. Unbalance Impedance:50Ω(Nominal) Balance Impedance:50Ω(Nominal)
		LDB15C500A1842	1842.5	F ₀ ±37.5	0.8	2.0	2.0×1.25×1.05 max. Unbalance Impedance:50Ω(Nominal) Balance Impedance:50Ω(Nominal)
	Dual Baluns	LDB25D500A0004A	947.5(F ₁) 1842.5(F ₂)	F ₁ ±12.5 F ₂ ±37.5	0.9 1.4	2.0	3.2×2.5×1.7 max. Unbalance Impedance:50Ω(Nominal) Balance Impedance:50Ω(Nominal)

Mixer

Block	Products	Parts Numbers	Center Frequency F ₀ (MHz)	Band Width (MHz)	Insertion Loss (dB max.)	VSWR (max.)	Amplitude Balance (dB max.)	Size (mm) / Others
Divider	3dB 90° Hybrid	LDC25B030F0900	900.0	F ₀ ±100	3.3±0.5	1.5	1.0	3.2×2.5×1.0 max. Phase Deviation:90°±3.0
	Hybrid Divider	LDD15A030D1660	1660.0	F ₀ ±13.5	3.4±0.4	1.5	1.0	2.0×1.25×1.05 max. Phase Deviation:0°±3° Attenuation:12.0dB min. (2×(F ₀ ±13.5)MHz), 22.0dB min. (3×(F ₀ ±13.5)MHz)

Block	Products	Parts Numbers	Frequency Range (MHz)	Supply Voltage (V)	Size (mm)
Synthesizer	Rx VCO	MQW1 Series	1150 to 1185+1575 to 1655	2.7	9.6×7.0×1.6
	Tx High Power VCO	MQW0 Series	880 to 915+1710 to 1785	2.7	9.8×8.0×1.6

IF

Block	Products	Parts Numbers	Center Frequency F ₀ (MHz)	Band Width (kHz)	Insertion Loss (dB max.)	Ripple (dB max.)	GDT Deviation (μsec. max.)	Attenuation (dB min.)	Size (mm) / Others
1st IF Filters	SAW Filters	SAFC246.000MC30X	246.0 (F ₀)	±80.0 (from F ₀)	5.0 (F ₀)	1.0	2.5 (F ₀ ± 80kHz)	25 (F ₀ ± 400kHz) 40 (F ₀ ± 600kHz)	9.1×4.8×1.8 max. Input Output Impedance: 420 Ω/-3.6pF
2nd IF Filters	CERAFIL®	CFSJC6.0MP1	6.00 (Fn)	±80 to ±115	7.5±2.0	3.0	5.0 (within Fn ± 80kHz)	12 (Fn ± 200kHz) 30 (Fn ± 400kHz)	8.5×5.9×1.7 Input Output Impedance: 500 Ω
		CFECS13.0ME22	13.00 (Fn)	±90 min. (1dB)	6.0	1.0 (within Fn ± 90kHz)	1.5 (within Fn ± 90kHz)	25 (Fn ± 400kHz) 35 (Fn ± 600kHz)	3.45×3.1×1.6 Input Output Impedance: 330 Ω

for GSM (TDMA/FDD) Tx:890–915MHz, Rx:935–960MHz

RF / LO

Block	Products	Parts Numbers	Center Frequency F ₀ (MHz)	Band Width (MHz)	Insertion Loss in BW (dB max.)	Ripple in BW (dB max.)	VSWR in BW (max.)	Attenuation (dB min.) (() MHz)	Size (mm) / Others
Antennas/ Duplexers	GIGAFIL [®]	DFG2R902CR947NHCB	902.5	F _T ±12.5	2.1	1.4	1.7	20 (F _R ±12.5)	14×7.6×4 max.
			947.5	F _R ±12.5	3.2	1.4	1.8	30 (F _T ±12.5)	
	RF Diode Switches	LMS30L0897H103	897.5	F _T ±17.5	0.9	—	2.0	25 ((F _T X2)±(BW/2X2)), 25 ((F _T X3)±(BW/2X3))	4.9×3.2×2.0 max. Isolation:20.0dB min. Power Capacity:35dBm
			942.5	F _R ±17.5	1.0	—	2.0		
Filters(Tx)	GIGAFIL [®]	DFC2R902P025HHB	902.5	F ₀ ±12.5	2.6	1.2	2.3	6.5 (F ₀ +32.5)	5.8×8.2×3.0 max.
			DFC2R902E025BHD	902.5	F ₀ ±12.5	1.0	0.6	2.0	10 (935–960)
	Multilayer LC Filters	LFTC15N19E0902B	902.5	F ₀ ±12.5	0.6	—	1.5	30.0 (2X(F ₀ ±12.5)), 30.0 (3X(F ₀ ±12.5))	2.0×1.25×1.05 max. Impedance:50Ω(Nominal) Power Capacity:3W
	SAW Filters	SAFC902.5MWC90T	902.5	F ₀ ±12.5	3.5	1.5	2.3	25 (935–960)	3.0×3.0×1.4 max. Input Output Impedance: 50Ω (Balance Type)
Filters(Rx)	GIGAFIL [®]	DFC2R947P025HHB	947.5	F ₀ ±12.5	2.6	1.2	2.3	9 (F ₀ –32.5)	5.8×8.2×3.0 max.
	Multilayer LC Filters	LFSA25-12B0947B	947.5	F ₀ ±12.5	3.0	1.3	2.2	9.0 (0.3–835) 8.0 (1000–1394) 11.0 (1394–1805) 14.0 (1805–1880)	3.2×2.5×1.9 max. Impedance:50Ω Power Capacity:500mW
	SAW Filters	SAFC947.5MWC90T	947.5	F ₀ ±12.5	3.5	1.5	2.3	30 (890–915)	3.0×3.0×1.4 max. Input Output Impedance: 50Ω (Balance Type)

Block	Products	Parts Numbers	Center Frequency F ₀ (MHz)	Band Width (MHz)	Insertion Loss in BW (dB max.)	VSWR in BW (max.)	Size (mm) / Others
Couplers	Hybrid Couplers	LDC15B200J0897	897.5	F ₀ ±17.5	0.18	1.4	2.0×1.25×1.05 max. Coupling:20.0dB±1.0
Baluns	Hybrid Baluns	LDB15C500A0942	942.5	F ₀ ±17.5	1.4	2.0	2.0×1.25×1.05 max. Unbalance Impedance:50Ω(Nominal) Balance Impedance:50Ω(Nominal)
Isolators	Isolators	CE073R902DCB	902.5	F ₀ ±12.5	0.7	1.6	7×7×2.5 max. Isolation:13dB

Mixer

Block	Products	Parts Numbers	Center Frequency F ₀ (MHz)	Insertion Loss in BW (dB)	VSWR in BW (max.)	Amplitude Balance (dB max.)	Size (mm) / Others
Divider	3dB 90° Hybrid	LDC25B030F0900	800–1000	3.3±0.5	1.5	1.0	3.2×2.5×1.0 max. Phase Deviation:90°±3.0

Block	Products	Parts Numbers	Frequency Range (MHz)	Supply Voltage (V)	Size (mm)
Synthesizer	VCO	MQE900 Series	1130–1212	4.0	7.8×6.0×2.0 max.

IF

Block	Products	Parts Numbers	Center Frequency (MHz)	Band Width (kHz)	Insertion Loss (dB max.)	Ripple in BW (dB max.)	GDT Deviation (μ sec. max.)	Attenuation (dB min.)	Size (mm) / Others
1st IF Filters	SAW Filters	SAFC246.000MC30X	246.0 (F ₀)	±80.0 (from F ₀)	5.0 (F ₀)	1.0	2.5 (F ₀ ±80kHz)	25 (F ₀ ±400kHz) 40 (F ₀ ±600kHz)	9.1×4.8×1.8 max. Input Output Impedance: 420Ω//–3.6pF
2nd IF Filters	CERAFIL [®]	CFEVCV13.0ME21	13.000 (F _n)	F _n ±90 min. (2dB BW)	6.0 (Minimum Point)	1.0 (within F _n ±90kHz)	1.5 (F _n ±90kHz)	25 (F _n ±400kHz) 35 (F _n ±600kHz)	6.9×2.9×1.5 Input Output Impedance: 330Ω
		CFECS13.0ME22	13.000 (F _n)	F _n ±90 min. (1dB BW)	6.0 (Minimum Point)	1.0 (within F _n ±90kHz)	1.5 (F _n ±90kHz)	25 (F _n ±400kHz) 35 (F _n ±600kHz)	3.45×3.1×1.6 Input Output Impedance: 330Ω

for PCS (CDMA1900) (CDMA/FDD) Tx:1850–1910MHz, Rx:1930–1990MHz

RF / LO

Block	Products	Parts Numbers	Center Frequency F ₀ (MHz)	Band Width (MHz)	Insertion Loss in BW (dB max.)	Ripple in BW (dB max.)	VSWR in BW (max.)	Attenuation (dB min.) () MHz	Size (mm) / Others
Antennas/ Duplexers	GIGAFIL [®]	DFTK1R881C1R96HHC	1880.0	F _T ± 30.0	3.5	2.5	2.0	35 (F _R ±30.0)	28.1×8.5×4.9
			1960.0	F _R ± 30.0	4.4	3.0	2.2	45 (F _T ±30.0)	
Filters(Tx)	GIGAFIL [®]	DFC21R88P060HHA	1880.0	F ₀ ± 30.0	1.5	0.5	2.0	40 (1480)	4.8×4.3×3 max.
		DFC31R88P060HHA	1880.0	F ₀ ± 30.0	2.4	1.0	2.0	45 (1480)	7.5×4.3×3 max.
		DFC31R88P060LHA	1880.0	F ₀ ± 30.0	3.7	2.0	3.0	5 (1930)	5.7×4.4×2 max.
	Multilayer LC Filters	LFSN30N15C1880B	1880.0	F ₀ ± 30.0	2.2	1.0	2.0	40.0 (1400) 40.0 (1640)	4.5×3.2×1.6 max. Impedance:50Ω(Nominal) Power Capacity:500mW
		LFTC15N19E1920B	1920.0	F ₀ ± 70.0	0.7	—	1.8	24.0 (3335–3700) 30.0 (3700–3820) 25.0 (3820–6000)	2.0×1.25×1.05 max. Impedance:50Ω(Nominal) Power Capacity:1W
	SAW Filters	SAFC1867.5T1897.5ML80T	1867.5 1897.5	F ₀ ± 17.5 F ₀ ± 12.5	2.8	1.8	1.8	30 (DPX Range)	3.8×3.8×1.5 max. (2 Filter in 1 Package)
Filters(Rx)	GIGAFIL [®]	DFC21R96P060HHA	1960.0	F ₀ ± 30.0	1.5	0.5	2.0	40 (1560)	4.8×4.3×3 max.
		DFC31R96P060HHA	1960.0	F ₀ ± 30.0	2.4	1.0	2.0	45 (1560)	7.5×4.3×3 max.
		DFC31R96P060LHA	1960.0	F ₀ ± 30.0	3.7	2.0	3.0	5 (1910)	5.7×4.4×2 max.
	Multilayer LC Filters	LFSN30N15C1960B	1960.0	F ₀ ±30.0	2.5	1.0	2.0	39.0 (1520) 16.0 (1740)	4.5×3.2×1.6max. Impedance:50Ω(Nominal) Power Capacity:500mW

Block	Products	Parts Numbers	Center Frequency F ₀ (MHz)	Band Width (MHz)	Insertion Loss in BW (dB max.)	VSWR in BW (max.)	Size (mm) / Others
Couplers	Hybrid Couplers	LDC15B140J1880	1880.0	F ₀ ±30.0	0.32	1.4	2.0×1.25×1.05 max. Coupling:14.4dB±1.0
Baluns	Hybrid Baluns	LDB15C201A1900	1900.0	F ₀ ±100	0.8	2.0	2.0×1.25×1.05 max. Unbalance Impedance:50Ω(Nominal) Balance Impedance:200Ω(Nominal)
Isolators	Isolators	CE0521R88DCB	1880.0	F ₀ ±30.0	0.6	1.6	5×5×2.0 max. Isolation:15dB

Mixer

Block	Products	Parts Numbers	Center Frequency F ₀ (MHz)	Insertion Loss in BW (dB)	VSWR in BW (max.)	Amplitude Balance (dB max.)	Size (mm) / Others
Divider	Hybrid Divider	LDD15A030D1750	1750.0±30.0	3.4±0.5	1.5	—	2.0×1.25×1.05 max. Phase Deviation:0° ±3° Attenuation:10.0dB min. (2×(F ₀ ±30.0)MHz), 20.0dB min. (3×(F ₀ ±30.0)MHz)

Block	Products	Parts Numbers	Frequency Range (MHz)	Supply Voltage (V)	Size (mm)
Synthesizer	VCO	MQK Series	1720–1780	2.95	5.5×4.8×1.6
	PLL Modules	HFQC Series	1719–1779	3.0	9.8×8.0×1.8

IF

Block	Products	Parts Numbers	Center Frequency F ₀ (MHz)	Band Width (kHz) (from F ₀)	Insertion Loss at F ₀ (dB max.)	Ripple in BW (dB max.)	GDT Deviation (μ sec. max.)	Attenuation (dB min.)	Size (mm) / Others
1st IF Filters	SAW Filters	SAFC85.380ME35X	85.38	±13	5.5	1.5 (F ₀ ±13kHz)	10 (F ₀ ±10kHz)	25 (F ₀ ±60kHz) 40 (F ₀ ±120kHz)	9.1×4.8×1.9 max. Input Output Impedance: 870Ω/–1.7pF
		SAFC210.38MWJIS0X	210.38	±630	8.5	1.0 (F ₀ ±300kHz)	2.5°rms	33 (F ₀ ±1.25MHz)	13.3×5.0×2.1 max. Balance Type Available

for AMPS/ADC (CDMA/FDD, TDMA/FDD, FDMA/FDD) Tx:824–849MHz, Rx:869–894MHz

RF / LO

Block	Products	Parts Numbers	Center Frequency F ₀ (MHz)	Band Width (MHz)	Insertion Loss in BW (dB max.)	Ripple in BW (dB max.)	VSWR in BW (max.)	Attenuation (dB min.) (() MHz)	Size (mm) / Others
Antennas/ Duplexers	GIGAFIL [®]	DFYGR836CR881NHB	836.5	F _T ±12.5	2.6	1.75	1.7	42 (F _R ±12.5)	21×8.2×4
			881.5	F _R ±12.5	4.5	2.30	1.8	56 (F _T ±12.5)	
		DFY2R836CR881GHD	836.5 (F _T)	F _T ±12.5	2.4	1.7	1.7	36 (F _R ±12.5)	19×11×3.6 max.
			881.5 (F _R)	F _R ±12.5	4.3	1.7	1.8	50 (F _T ±12.5)	
Filters(Tx)	GIGAFIL [®]	DFC2R836P025HHD	836.5	25	2.6	1.2	2.3	6.5 (869–894)	5.8×8.2×3 max.
								DFC3R836P025HHD	
	Multilayer LC Filters	LFSA25-12B0836B	836.5	F ₀ ±12.5	3.0	1.0	2.2	20.0 (F ₀ ±77.5)	3.2×2.5×1.9 max. Impedance:50Ω (Nominal) Power Capacity:500mW
								SAW Filters	

Block	Products	Parts Numbers	Center Frequency F ₀ (MHz)	Band Width (MHz)	Insertion Loss in BW (dB max.)	VSWR in BW (max.)	Size (mm) / Others
Couplers	Hybrid Couplers	LDC15B200J0836	836.5	F ₀ ±12.5	0.17	1.4	2.0×1.25×1.05 max. Coupling:20.6dB±1.0
Baluns	Hybrid Baluns	LDB15C201A0836	836.5	F ₀ ±12.5	1.0	2.0	2.0×1.25×1.05 max. Unbalance Impedance:50Ω (Nominal) Balance Impedance:200Ω (Nominal)
Isolators	Isolators	CE053R836DCB	836.5	25	0.65	1.5	5×5×2.0 max. / Isolation:13dB

Mixer

Block	Products	Parts Numbers	Center Frequency F ₀ (MHz)	Insertion Loss in BW (dB)	VSWR in BW (max.)	Amplitude Balance (dB max.)	Size (mm) / Others
Divider	Hybrid Divider	LDD15A030D0967	967.0±13.0	3.4±0.5	1.5	—	2.0×1.25×1.05 max. Phase Deviation:0°±3° Attenuation:12.0dB min. (2×(F ₀ ±13.0)MHz), 22.0dB min. (3×(F ₀ ±13.0)MHz)

Block	Products	Parts Numbers	Frequency Range (MHz)	Supply Voltage (V)	Size (mm)
Synthesizer	VCO	MQK Series	954–980	2.9	5.5×4.8×1.6
		MQE900 Series	824–849	2.7	7.8×5.8×1.8
	PLL Modules	HFQC Series	954–980	3.0	9.8×8.0×1.8

IF

Block	Products	Parts Numbers	Center Frequency	Band Width (kHz)	Insertion Loss at F ₀ (dB max.)	Ripple in BW (dB max.)	GDT Deviation (μ sec. max.)	Attenuation (dB min.)	Size (mm) / Others
1st IF Filters	SAW Filters	SAFC85.380ME35X	85.38MHz (F ₀)	±13 (from F ₀)	5.5	1.5 (F ₀ ±13kHz)	10 (F ₀ ±10kHz)	25 (F ₀ ±60kHz) 40 (F ₀ ±120kHz)	9.1×4.8×1.9 max. Input Output Impedance: 870Ω/-1.7pF
2nd IF Filters	CERAFIL [®]	CFUXC450B400H	450.0kHz (F _n)	F _n ±15.0 kHz min. (6dB BW)	5.0 (at F _n)	0.5 (within F _n) (±12kHz)	25 (within F _n) (±12kHz)	47 (within F _n) (±100kHz)	6.5×6.5×1.7 Input Output Impedance: 2.0kΩ

for PDC800 (TDMA/FDD) Tx:940–960MHz, Rx:810–830MHz

RF / LO

Block	Products	Parts Numbers	Center Frequency F ₀ (MHz)	Band Width (MHz)	Insertion Loss in BW (dB max.)	Ripple in BW (dB max.)	VSWR in BW (max.)	Attenuation (dB min.) () (MHz)	Size (mm) / Others
Antennas/ Duplexers	GIGAFIL®	DFY2R820CR950KHB	950.0	F _T ±10.0	0.5	0.3	1.7	20 (F _R ±10.0)	8×13.5×2.5 max.
			820.0	F _R ±10.0	1.8	0.5	1.8	27(F _T ±10.0)	
	RF Diode Switches	LMS36A0874H003	937.5	F _T ±22.5	Tx→ANT1:0.8 ANT1→Rx:0.9 ANT2→Rx:0.85	—	2.0	25.0 (2×F _T)	6.7×5.0×2.0 max. Isolation:20dB min. Power Capacity:35dBm
			847.5	F _R ±37.5			2.0	20.0 (3×F _T)	
Filters(Tx)	Multilayer LC Filters	LFTC10N19C0924B	924.5	F ₀ ±33.5	0.45	—	1.7	20.0 (2×(F ₀ ±33.5)) 15.0 (3×(F ₀ ±33.5))	1.6×0.8×0.70 max. Impedance:50Ω(Nominal) Power Capacity:1W
	SAW Filters	SAFC950MC90T	950.0	F ₀ ±10.0	3.5	1.5	2.5	48 (810–830)	3.0×3.0×1.4 max. Input Output Impedance: 50Ω
Filters(Rx)	GIGAFIL®	DFC2R820P020HHB	820.0	20.0	2.0	0.7	2.0	20 (940–960)	5.8×8.2×3 max.
	Multilayer LC Filters	LFSC25N26B0848B	847.5	F ₀ ±37.5	1.5	0.7	2.0	25.0 (550–583) 17.0 (610–625)	3.2×2.5×1.65 max. Impedance:50Ω(Nominal) Power Capacity:500mW
	SAW Filters	SAFC820MD90T	820.0	F ₀ ±10.0	2.2	1.3	2.5	30 (940–960)	3.0×3.0×1.4 max. Input Output Impedance: 50Ω
LO Filters	Multilayer LC Filters	LFL30-15C0717B075	717.5	F ₀ ±37.5	4.2	2.3	2.5	19 (810–885) 40 (925–960)	4.5×3.2×2.1 max. Impedance:50Ω(Nominal) Power Capacity:500mW

Block	Products	Parts Numbers	Center Frequency F ₀ (MHz)	Band Width (MHz)	Insertion Loss in BW (dB max.)	VSWR in BW (max.)	Size (mm) / Others
Couplers	Hybrid Couplers	LDC15B190K0924	924.5	F ₀ ±35.5	0.17	1.4	2.0×1.25×1.05 max. Coupling:19.8dB±1.2
	Couplers With LPF	LDC15H190L0926	926.5	F ₀ ±33.5	0.45	1.3	2.0×1.25×1.05 max. Coupling:19.3dB±1.3 Attenuation:23.0dB min. (2×(F ₀ ±33.5)MHz), 15.0dB min. (3×(F ₀ ±33.5)MHz)
Baluns	Hybrid Baluns	LDB15C500A0924	924.5	F ₀ ±35.5	1.3	2.0	2.0×1.25×1.05 max. Unbalance Impedance:50Ω(Nominal) Balance Impedance:50Ω(Nominal)
Isolators	Isolators/ Circulators	CE053R950CCB	950.0	20	0.65	1.6	5×5×2 max. Isolation:12dB

Mixer

Block	Products	Parts Numbers	Center Frequency F ₀ (MHz)	Insertion Loss in BW (dB)	VSWR in BW (max.)	Amplitude Balance (dB max.)	Size (mm) / Others
Divider	3dB 90° Hybrid	LDC25B030F0900	800–1000	3.3±0.5	1.5	1.0	3.2×2.5×1.0 max. Phase Deviation:90°±3.0

Block	Products	Parts Numbers	Frequency Range (MHz)	Supply Voltage (V)	Size (mm)
Synthesizer	VCO	MQL Series	680–755	2.2	5.0×4.0×1.6

IF

Block	Products	Parts Numbers	Center Frequency (MHz)	Band Width (kHz)	Insertion Loss (dB max.)	Ripple in BW (dB max.)	GDT Deviation (μ sec. max.)	Attenuation (dB min.)	Size (mm) / Others
1st IF Filters	SAW Filters	SAFC130.000MA1G0X	130.000 (F ₀) (MHz)	±16 (from F ₀)	5.5 (at Minimum Loss Point)	0.5 (F ₀ ±10.5kHz)	5.0 (F ₀ ±10.5kHz)	22 (F ₀ ±100kHz) 72 (F ₀ –885kHz to –925kHz)	6.0×3.5×1.65 max. Input Output Impedance: 740Ω//–1.1pF
2nd IF Filters	CERAFIL®	CFUXC450C311H	450 (F _n) (kHz)	F _n ±9.0– 12.0kHz (3dB BW)	6.0 (at F _n)	0.5 (within F _n) (±10.5kHz)	27.0 (within F _n) (±10.5kHz)	47 (within F _n) (±100kHz)	6.0×5.2×1.9 Input Output Impedance: 2.0kΩ

for PDC1500 (TDMA/FDD) Tx:1429–1453MHz, Rx:1477–1501MHz

RF / LO

Block	Products	Parts Numbers	Center Frequency F ₀ (MHz)	Band Width (MHz)	Insertion Loss in BW (dB max.)	Ripple in BW (dB max.)	VSWR in BW (max.)	Attenuation (dB min.) () (MHz)	Size (mm) / Others
Antennas/ Duplexers	RF Diode Switches	LMS36A1441H203	1441.0	F _T ±12.0	Tx→ANT1:0.8 ANT1→Rx:0.9	—	2.0	25.0 (2×F _T)	6.7×5.0×2.0 max. Isolation:20.0dB min. Power Capacity:35dBm
			1489.0	F _R ±12.0	ANT2→Rx:0.8		2.0	25.0 (3×F _T)	
Filters(Tx)	Multilayer LC Filters	LFSA25-14B1441B	1441.0	F ₀ ±12.0	3.0	1.5	2.2	25.0 (1607–1631)	3.2×2.5×1.9 max. Impedance:50Ω(Nominal) Power Capacity:500mW
		LFTC15N19E1441B	1441.0	F ₀ ±12.0	0.47	—	1.5	31.0 (2×F ₀) 26.0 (3×F ₀)	2.0×1.25×1.05 max. Impedance:50Ω(Nominal) Power Capacity:3W
	SAW Filters	SAFS1441MC1B0T	1441	F ₀ ±12.0	2.7	1.5	2.3	15 (1477–1501)	2.5×2.0×1.1 max. Input Output Impedance: 50Ω
Filters(Rx)	GIGAFIL [®]	DFC21R48P024LHA	1489.0	24	1.4	0.5	2.0	10 (1607–1631)	3.8×5.2×2.0max.
	Multilayer LC Filters	LFSG20N16B1489B	1489.0	F ₀ ±12.0	1.3	0.3	2.0	25.0 ((F ₀ +256.9)±12)	3.2×1.6×1.3max. Impedance:50Ω(Nominal) Power Capacity:500mW
	SAW Filters	SAFS1489MC1B0T	1489	F ₀ ±12.0	2.7	1.5	2.3	35 (1607–1631)	2.5×2.0×1.1 max. Input Output Impedance: 50Ω
LO Filters	Multilayer LC Filters	LFSA25-13B1619B	1619.0	F ₀ ±12.0	2.8	0.8	2.0	20.0 (1477–1501)	3.2×2.5×1.9 max. Impedance:50Ω(Nominal) Power Capacity:500mW

Block	Products	Parts Numbers	Center Frequency F ₀ (MHz)	Band Width (MHz)	Insertion Loss in BW (dB max.)	VSWR in BW (max.)	Size (mm) / Others
Couplers	Hybrid Couplers	LDC15B160J1441	1441.0	F ₀ ±12.0	0.26	1.4	2.0×1.25×1.05 max. Coupling:16.3dB ± 1.0
Baluns	Hybrid Baluns	LDB15C201A1600	1600.0	F ₀ ±100	0.8	2.0	2.0×1.25×1.05 max. Unbalance Impedance:50Ω(Nominal) Balance Impedance:200Ω(Nominal)
Isolators	Isolators/ Circulators	CE0521R44CCB	1441.0	24	0.6	1.5	5×5×2 max. Isolation:14dB

Mixer

Block	Products	Parts Numbers	Center Frequency F ₀ (MHz)	Insertion Loss in BW (dB)	VSWR in BW (max.)	Amplitude Balance (dB max.)	Size (mm) / Others
Divider	Hybrid Divider	LDD15A030D1619	1619.0±12.0	3.4±0.4	1.5	—	2.0×1.25×1.05 max. Phase Deviation:0°±3° Attenuation:12.0dB min. (2×(F ₀ ±12.0)MHz), 22.0dB min. (3×(F ₀ ±12.0)MHz)

Block	Products	Parts Numbers	Frequency Range (MHz)	Supply Voltage (V)	Size (mm)
Synthesizer	VCO	MQL Series	1607.0–1631.0	2.2	5.0×4.0×1.6
	PLL Modules	HFQD Series	1607.0–1631.0+129/178	2.8	9.8×8.0×1.8

IF

Block	Products	Parts Numbers	Center Frequency F ₀	Band Width (kHz)	Insertion Loss (dB max.)	Ripple in BW (dB max.)	GDT Deviation (μ sec. max.)	Attenuation (dB min.)	Size (mm) / Others
1st IF Filters	SAW Filters	SAFC130.000MA1G0X	130.000 (MHz)	±16 (from F ₀)	5.5 (at Minimum Loss Point)	0.5 (F ₀ ±10.5kHz)	5.0 (F ₀ ±10.5kHz)	22 (F ₀ ±100kHz) 40 (F ₀ ±200kHz) 72 (F ₀ –885kHz to –925kHz)	6.0×3.5×1.65 max. Input Output Impedance: 740Ω//–1.1pF
	Multilayer LC Filters	LFK30-04E0178L001	178.0 (MHz)	F ₀ ±0.5MHz	1.5 (at F ₀)	—	—	30.0 (2×F ₀ MHz) 25.0 (3×F ₀ MHz)	4.5×3.2×2.3 max. Impedance:50Ω(Nominal) Power Capacity:1W
2nd IF Filters	CERAFIL [®]	CFUXC450C311H	450 (Fn) (kHz)	F _n ±9.0– 12.0kHz (3dB BW)	6.0 (at F _n)	0.5 (within F _n) (±10.5kHz)	27.0 (within F _n) (±10.5kHz)	47 (within F _n) (±100kHz)	6.0×5.2×1.9 Input Output Impedance: 2.0kΩ

for J-CDMA (CDMA/FDD) Tx:887-925MHz, Rx:832-870MHz

RF / LO

Block	Products	Parts Numbers	Center Frequency F ₀ (MHz)	Band Width (MHz)	Insertion Loss in BW (dB max.)	Ripple in BW (dB max.)	VSWR in BW (max.)	Attenuation (dB min.) () (MHz)	Size (mm) / Others
Antennas/ Duplexers	GIGAFIL [®]	DFYMR851CR906KHGB	894 (F _T -L)	F _T -L±7	1.8	0.7	1.8	30 (F _R -L±7)	18×15×4 max. ON:F _T -L/F _R -L OFF:F _T -H/F _R -H ON:6mA max.
			920 (F _T -H)	F _T -H±5	1.7	0.7	1.8	30 (F _R -H±5)	
			839 (F _R -L)	F _R -L±7	4.1	1.2	1.8	51 (F _T -L±7)	
			865 (F _R -H)	F _R -H±5	3.6	1.0	1.8	51 (F _T -H±5)	
Filters(Tx)	Multilayer LC Filters	LFSA25-12B0906B	906.0	F ₀ ±12.5	3.5	1.0	2.2	20.0 (F ₀ ±90.0)	3.2×2.5×1.9 max. Impedance:50Ω(Nominal) Power Capacity:500mW
	SAW Filters	SAFC906ML90T	906	F ₀ ±19	4.5	2.8	2.8	30 (832-870)	3.0×3.0×1.4 max. Input Output Impedance: 50Ω
Filters(Rx)	Multilayer LC Filters	LFSA25-12B0851B	851.0	F ₀ ±12.5	3.5	1.0	2.2	20.0 (F ₀ ±90.0)	3.2×2.5×1.9 max. Impedance:50Ω(Nominal) Power Capacity:500mW
	SAW Filters	SAFC851ML90T	851	F ₀ ±19	4.5	3.0	2.8	22 (887-925)	3.0×3.0×1.4 max.

Block	Products	Parts Numbers	Center Frequency F ₀ (MHz)	Band Width (MHz)	Insertion Loss in BW (dB max.)	VSWR in BW (max.)	Size (mm) / Others
Couplers	Hybrid Couplers	LDC15B200J0836	836.5	F ₀ ±12.5	0.17	1.4	2.0×1.25×1.05 max. Coupling:20.6dB±1.0
Baluns	Hybrid Baluns	LDB15C201A0836	836.5	F ₀ ±12.5	1.0	2.0	2.0×1.25×1.05 max. Unbalance Impedance:50Ω(Nominal) Balance Impedance:200Ω(Nominal)
Isolators	Isolators	CE053R906DCB	906	38	0.7	1.6	5×5×2 max. Isolation:11dB

Mixer

Block	Products	Parts Numbers	Center Frequency F ₀ (MHz)	Insertion Loss in BW (dB)	VSWR in BW (max.)	Amplitude Balance (dB max.)	Size (mm) / Others
Divider	Hybrid Divider	LDD15A030D0967	967.0±13.0	3.4±0.4	1.5	—	2.0×1.25×1.05 max. Phase Deviation:0°±3° Attenuation:12.0dB min. (2×(F ₀ ±13.0)MHz), 22.0dB min. (3×(F ₀ ±13.0)MHz)

Block	Products	Parts Numbers	Frequency Range (MHz)	Supply Voltage (V)	Size (mm)
Synthesizer	VCO	MQL Series	720-760	3.0	5.0×4.0×1.6
	PLL Modules	HFQC Series	720-760	3.0	9.8×8.0×1.8

IF

Block	Products	Parts Numbers	Center Frequency F ₀ (MHz)	Band Width (kHz)	Insertion Loss at F ₀ (dB max.)	Ripple in BW (dB max.)	GDT Deviation (μ sec. max.)	Attenuation (dB min.)	Size (mm) / Others
1st IF Filters	SAW Filters	SAFC111.850MWJ21X	111.850	±630	14.0	1.5 (F ₀ ±300kHz)	10 (F ₀ ±630kHz)	33 (F ₀ ±900kHz)	19.0×6.5×2.05 max. Impedance: 1.2kΩ/217nH (Input) 1.2kΩ/198nH (Output)

for W-CDMA (CDMA/FDD) Tx:1920–1980MHz, Rx:2110–2170MHz

RF / LO

Block	Products	Parts Numbers	Center Frequency F ₀ (MHz)	Band Width (MHz)	Insertion Loss in BW (dB max.)	Ripple in BW (dB max.)	VSWR in BW (max.)	Attenuation (dB min.) (() MHz)	Size (mm) / Others
Antennas/ Duplexer	GIGAFIL [®]	DFYKIR95C2R14LHA	1950	F _T ±30	1.5	0.5	1.8	45 (F _R ±30)	14.6×7.4×2 max.
			2140	F _R ±30	2.3	1.0	1.9	50 (F _T ±30)	
Top Filters	SAW Filters	SAFC Series	*	*	*	*	*	*	*
	GIGAFIL [®]	DFC22R14P060LHB	2140	F _R ±30	2.7	1.2	2.0	26 (F _T ±30)	4.4×4.0×2 max.
	Multilayer LC Filters	LFSP 20 Series	*	*	*	*	*	*	*
		LFTC 10 Series	*	*	*	*	*	*	*
Interstage Filters	Multilayer LC Filters	LFSG 20/25 Series	*	*	*	*	*	*	*
	GIGAFIL [®]	DFC31R95P060LHD	1950	F _T ±30	3.5	1.5	2.0	35 (F _R ±30)	5.7×4.4×2 max.
		DFC32R14P060LHA	2140	F _R ±30	3.7	1.5	3.0	30 (F _T ±30)	5.7×4.4×2 max.
	SAW Filters	SAFC Series	*	*	*	*	*	*	*

Block	Products	Parts Numbers	Center Frequency F ₀ (MHz)	Band Width (MHz)	Insertion Loss in BW (dB max.)	VSWR in BW (max.)	Size (mm) / Others
Couplers	Hybrid Couplers	LDC15 Series	*	*	*	*	*
Baluns	Hybrid Baluns	LDB15 Series	*	*	*	*	*
Isolators	Isolators	CE0521R95DCB	1950	F _T ±30	0.6	1.6	5×5×2 max. Isolation:14dB

Mixer

Block	Products	Parts Numbers	Center Frequency F ₀ (MHz)	Insertion Loss in BW (dB)	VSWR in BW (max.)	Amplitude Balance (dB max.)	Size (mm) / Others
Divider	Hybrid Divider	LDD15 Series	*	*	*	*	*

Block	Products	Parts Numbers	Frequency Range (MHz)	Supply Voltage (V)	Size (mm)
Synthesizer	VCO	MQL Series	2300–2360	2.2	5.0×4.0×1.6
	PLL Modules	HFQD Series	2300–2360+380	PLL(3.0) VCO(2.7)	12.6×8.6×1.8

IF

Block	Products	Parts Numbers	Center Frequency F ₀ (MHz)	Band Width (kHz)	Insertion Loss (dB max.)	Ripple in BW (dB max.)	GDT Deviation (μsec. max.)	Attenuation (dB min.)	Size (mm) / Others
1st IF Filters	SAW Filters	SAFC Series	*	*	*	*	*	*	*

* Please contact nearest sales representatives for details.

for DECT (TDMA/TDD) Tx:1880-1900MHz

RF / LO

Block	Products	Parts Numbers	Center Frequency F ₀ (MHz)	Band Width (MHz)	Insertion Loss in BW (dB max.)	Ripple in BW (dB max.)	VSWR in BW (max.)	Attenuation (dB min.) () MHz	Size (mm) / Others
Antenna Switches	RF Diode Switches	LMS33L1890L001	F _T 1890.0	F _T ±10.0	0.8	—	2.0	25.0 (2×F _T ,3×F _T)	5.4×4.0×2.3 max. Isolation:20.0dB min. Power Capacity:27dBm
			F _R 1890.0	F _R ±10.0	0.7	—	2.0		
Top Filters	GIGAFIL®	DFC21R89P020HHH	1890.0	F ₀ ±10	0.9	0.5	2.0	27 (1655-1679)	5.7×7.4×3 max.
		DFC21R89P020HHE	1890.0	20	2.0	0.5	2.0	45 (1660-1680)	4.8×3.9×3 max.
		DFC21R89P020HHG	1890.0	20	1.75	0.5	2.0	53 (1660-1680)	7.4×7.6×4 max.
		DFC21R89P020LHCA	1890.0	20	1.7	0.5	2.0	35 (1660-1680)	4.4×4.3×2 max.
	Multilayer LC Filters	LFSP20N28B1890B	1890.0	F ₀ ±10	0.85	0.5	2.0	27.0 (F ₀ -(463.1±10)) 20.0 (900) 20.0 (100)	3.2×1.6×1.4 max. Impedance:50Ω(Nominal) Power Capacity:500mW
		LFTC15N19E1890B	1890.0	F ₀ ±10.0	0.47	—	1.5	30.0 (2×(F ₀ ±10)), 25.0 (3×(F ₀ ±10))	2.0×1.25×1.05 max. Impedance:50Ω(Nominal) Power Capacity:3W
Interstage Filters	Multilayer LC Filters	LFSE25N25C1890B	1890.0	F ₀ ±10	2.5	0.5	2.0	40.0 (F ₀ -240) 40.0 (F ₀ -480) 15.0 (F ₀ +240)	3.2×2.5×1.6 max. Impedance:50Ω(Nominal) Power Capacity:500mW
	GIGAFIL®	DFC21R89P020HHE	1890.0	F ₀ ±10.0	2.0	0.5	2.0	45 (1660-1680)	4.8×3.9×3 max.
		DFC21R89P020LHC	1890.0	20	2.0	0.5	2.0	40.0 (1660-1680)	4.4×4.3×2 max.

Block	Products	Parts Numbers	Center Frequency F ₀ (MHz)	Band Width (MHz)	Insertion Loss in BW (dB max.)	VSWR in BW (max.)	Size (mm) / Others
Couplers	Hybrid Couplers	LDC15B140J1890	1890.0	F ₀ ±10.0	0.32	1.4	2.0×1.25×1.05 max. Coupling:14.4dB±1.0
Baluns	Hybrid Baluns	LDB15C201A1900	1900	F ₀ ±100	0.8	2.0	2.0×1.25×1.05 max. Unbalance Impedance:50Ω(Nominal) Balance Impedance:50Ω(Nominal)
Isolators	Isolators/ Circulators	CE0731R89CCB	1890.0	20	0.6	1.5	7×7×2.5 max. Isolation:15dB
		CE07A1R89CCB	1890.0	20	0.9	1.5	7×7×3 max. Isolation:15dB

Mixer

Block	Products	Parts Numbers	Center Frequency F ₀ (MHz)	Insertion Loss in BW (dB)	VSWR in BW (max.)	Amplitude Balance (dB max.)	Size (mm) / Others
Divider	Hybrid Divider	LDD15A030D1750	1750.0±30.0	3.4±0.4	1.5	—	2.0×1.25×1.05max. Phase Deviation:0°±3° Attenuation:12.0dB min. (2×(F ₀ ±30.0)MHz), 22.0dB min. (3×(F ₀ ±30.0)MHz)

IF

Block	Products	Parts Numbers	Center Frequency F ₀ (MHz)	Band Width (kHz) (from F ₀)	Insertion Loss at F ₀ (dB max.)	GDT Deviation (μsec. max.)	Attenuation (dB min.)	Size (mm) / Others
1st IF Filters	SAW Filters	SAFU110.6MSA40T	110.592	±576	4.5	0.7 (F ₀ ±576kHz)	10 (F ₀ ±1.150MHz) 30 (F ₀ ±1.728MHz)	11.4×5.0×2.0 max. Input Output Impedance: 300Ω//1.2μH

for ISM2400 (SS/TDD) Europe, USA:2400–2483.5MHz* Japan:2471–2497MHz

* except France, Spain

RF / LO

Block	Products	Parts Numbers	Center Frequency F ₀ (MHz)	Band Width (MHz)	Insertion Loss in BW (dB max.)	Ripple in BW (dB max.)	VSWR in BW (max.)	Attenuation (dB min.) (() MHz)	Size (mm) / Others
Antenna Switches	RF Diode Switches	LMS30C2450L003	2450.0	F ₀ ±50.0	Tx: 0.85	—	2.0	—	4.9×3.2×2.0 max. Power Capacity:27dBm
					Rx: 1.2	—			
Top Filters	GIGAFIL [®]	DFC22R45P100LHA	2450.0	F ₀ ±50	2.0	1.0	2.0	40 (F ₀ —500)	4.5×4×2 max.
	Multilayer LC Filters	LFSN25N19C2450B	2450.0	F ₀ ±50.0	1.8	0.5	2.0	48.0 (902—928) 50.0 (1500—1550)	3.2×2.5×1.6 max. Impedance:50Ω (Nominal) Power Capacity:500mW
		LFSP20N28B2450B	2450.0	F ₀ ±50.0	1.4	0.6	2.0	20.0 (902—928) 33.0 (1500—1550)	3.2×1.6×1.4 max. Impedance:50Ω (Nominal) Power Capacity:500mW
		LFTC15N19E2450B	2450.0	F ₀ ±50.0	0.6	—	1.5	30.0 (2×(F ₀ ±50)) 25.0 (3×(F ₀ ±50))	2.0×1.25×1.05 max. Impedance:50Ω (Nominal) Power Capacity:1W
Interstage Filters	Multilayer LC Filters	LFJ30-04B2450B0100	2450.0	F ₀ ±50.0	3.0	1.5	2.2	36.0 (1700—1800) 19.0 (2050—2150) 13.0 (2700—3000)	4.5×3.2×2.0 max. Impedance:50Ω (Nominal) Power Capacity:500mW
		LFSN25N16C2450B	2450.0	F ₀ ±50.0	2.7	1.5	2.2	35.0 (1950) 16.0 (2200) 24.0 (2×F ₀)	3.2×2.5×1.6 max. Impedance:50Ω (Nominal) Power Capacity:500mW
		LFSG20N27C2450B	2450.0	F ₀ ±50.0	2.0	0.8	2.0	38.0 (902—928) 15.0 (2100—2200)	3.2×1.6×1.4 max. Impedance:50Ω (Nominal) Power Capacity:500mW
	GIGAFIL [®]	DFC22R45P100LHA	2450.0	F ₀ ±50	2.0	1.0	2.0	40 (F ₀ —500)	4.5×4×2 max.

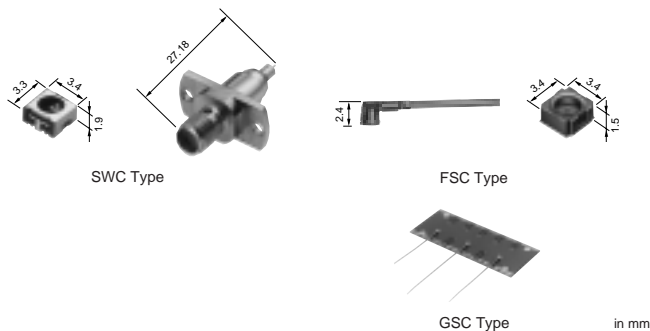
Block	Products	Parts Numbers	Center Frequency F ₀ (MHz)	Band Width (MHz)	Insertion Loss in BW (dB max.)	VSWR in BW (max.)	Size (mm) / Others
Couplers	Hybrid Couplers	LDC15B150J2450	2450.0	F ₀ ±50.0	0.35	1.2	2.0×1.25×1.05 max. Coupling:15.8dB±1.0
Baluns	Hybrid Baluns	LDB15C101A2400	2400.0	F ₀ ±100.0	0.9	2.1	2.0×1.25×1.05 max. Unbalance Impedance:50Ω(Nominal) Balance Impedance:100Ω(Nominal)

Mixer

Block	Products	Parts Numbers	Frequency Range (MHz)	Supply Voltage (V)	Size (mm)
Synthesizer	PLL Modules	HFQS Series	2489	3.0	9.8×8.0×1.8

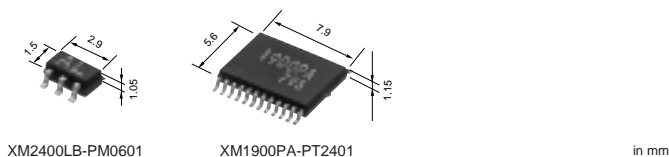
Murata Products for Mobile Communications

Microwave Coaxial Connectors



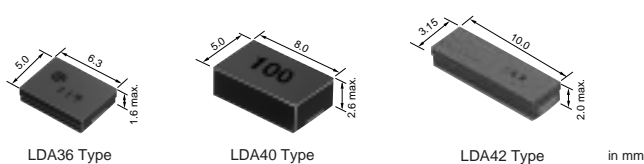
Type	Rated Voltage (V)	Rated Frequency (GHz)	Impedance (Ω)	VSWR max. (f:GHz)
GSC	250	DC-6	50	1.3
SWC	250	DC-3	50	1.2
FSC	250	DC-3	50	1.3

GaAs MMIC



Parts Number	Application	Characteristics
XM2400LB-PM0601	LNA for 2.4GHz frequency band	F=1.9dB, G=15.5dB VSWR (in/out)=1.8
XM1900PA-PT2401	1.9GHz RF Front-End (PA+LNA+SW)	PA_P1dB=20.5dBm PA_GP=36dB LNA_F=2.0dB SW_IL=0.7dB

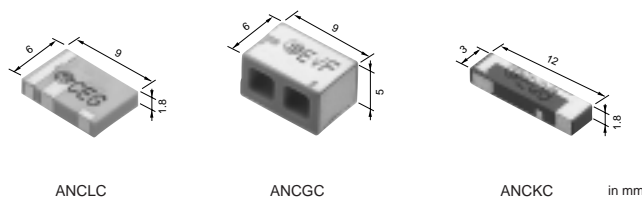
Antennas



Chip Multilayer Antennas

Parts Number	Frequency Range
LDA40D TYPE	470MHz-1.5GHz
LDA36D TYPE	1.5GHz-2.5GHz
LDA42D TYPE	900MHz-2.5GHz

● Frequency is changed with layout patterning of PCB. Please consult with us for appropriate design.



Chip Dielectric Antennas

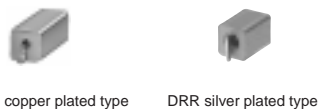
Parts Number	Center Frequency (MHz)	Band Width (MHz)	VSWR (max.)
ANCLC1R90J025AAA	1906.5	25.0	2
ANCLC1R89J020AAA	1890.0	20.0	
ANCGC1R48U024AAC	1489.0	24.0	3
ANCKC1R48U024AAA	1489.0	24.0	
ANCKCR819U018AAA	819.0	18.0	

Dielectric Resonators (RESOMICS®)



TE Mode

Material	ε _r	Frequency Range (GHz)
F Series	24	10.0-25.1
E Series	24	8.4-25.1
B Series	28	4.8-25.9
R Series	30	4.6-24.2
V Series	34	2.9-13.2
M Series	38	1.5-12.4
U Series	38	1.5-12.4



TEM Mode

Electrode	Material	ε _r	Frequency Range (MHz)
Copper	P	21.4±0.2	1000-5000
	K	92±1	440-3000
Silver	U	38±1	680-4800

Piezoelectric Speakers (CERAMITONE®)

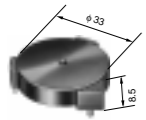


Parts Number	Frequency Range	Capacitance	Input Voltage
VSB35EW-0701B	600Hz-20kHz	340nF±35% at 120Hz	4Vrms max. (W/N JIS Filters)

Piezoelectric Diaphragms

Parts Number	Resonant Frequency (kHz)	Resonant Impedance (Ω max.)	Capacitance (nF, at 1kHz)	Input Voltage (Vp-p max.)
7BB-20-6	6.3±0.6	300	10±30%	30

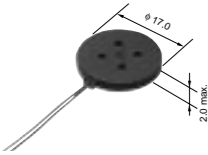
Piezoelectric Ringers (PIEZORINGER®)



in mm

Parts Number	Rating	Sound Pressure (dB min.)	Capacitance (pF at 120Hz)	Input Voltage (max.)
PKM33EP-1202C	1.2kHz/1Vrms Sine/10cm	64	40000±30%	40Vp-p

Piezoelectric Receivers (CERAMIPHONE®)



in mm

Parts Number	Sound Pressure	Capacitance (nF at 120Hz)
PKD17EW-01R	107±3dB	60±30%

Monolithic Ceramic Capacitors



● GRM33 Series Temperature Compensation size 0.6×0.3mm

TC	C0G
Rated Voltage (V)	DC25
Capacitance (pF)	1-100

● GRM33 Series High Dielectric Constant size 0.6×0.3mm

TC	X7R
Rated Voltage (V)	DC16
Capacitance (pF)	100-1000

● GRM36 Series Temperature Compensation size 1.0×0.5mm

TC	C0G	C0H	SL
Rated Voltage (V)	DC50	DC25	DC50
Capacitance (pF)	0.5-160	180-270	43-200
			220-390

● GRM36 Series High Dielectric Constant size 1.0×0.5mm

TC	X7R
Rated Voltage (V)	DC50
Capacitance (pF)	220-3900
	4700-6800
	8200, 10000
	27000-47000

TC	X5R
Rated Voltage (V)	DC16
Capacitance (pF)	12000-22000
	56000-100000

TC	Y5V
Rated Voltage (V)	DC50
Capacitance (pF)	2200-15000
	22000
	33000-100000

● High-Cap. Series

Parts Number	TC Rated Voltage (V) Size (mm)	X7R				X5R	
		DC50	DC25	DC16	DC10	DC6.3	
GRM39	1.6×0.8	-	-	-	-	1.0	
GRM40	2.0×1.25	-	-	1.0	-	2.2	
GRM42-6	3.2×1.6	-	1.0	-	2.2	4.7	
GRM42-2	3.2×2.5	1.0	-	2.2-4.7	-	10	

Parts Number	TC Rated Voltage (V) Size (mm)	Y5V			
		DC50	DC25	DC16	DC10
GRM39	1.6×0.8	-	-	-	1.0
GRM40	2.0×1.25	-	-	1.0-2.2	3.3-4.7
GRM42-6	3.2×1.6	-	1.0	4.7	10
GRM42-2	3.2×2.5	1.0	-	-	-

● High-Power Type GRM615 Series size 1.0×0.5mm

TC	COG
Rated Voltage (V)	DC50
Capacitance (pF)	0.5-20

High Frequency Monolithic Ceramic Capacitors



● High-Frequency Series

Parts Number	TC Rated Voltage (V) Size (mm)	C0G		
		200	100	50
GRH706	1.25×1.00	0.5-13	9-22	16-51
GRH708	2.00×1.25	0.5-51	39-91	75-160
GRH710	3.2×2.50	0.5-160	180-510	560-1000

● High Power / High Frequency Series

Parts Number	TC Rated Voltage (V) Size (mm)	C0G				
		500	300	200	100	50
GRH110	1.4×1.4	-	-	-	-	0.5-100
GRH111	2.8×2.8	0.5-100	110-200	220-470	510-680	750-1000

● High Frequency / HiQ Type GRQ Series

Parts Number	TC Rated Voltage (V) Size (mm)	C0G	
		100	50
GRQ706	1.6×0.8	0.5-6.8	7.5-24
GRQ708	2.0×1.25	0.5-18	22-47

High Frequency Microchip Capacitors

● CLB Series

TC	CG	UH	XL
Capacitance (pF)	0.1-16	0.3-56	0.8-110

TC	B	F	YFD
Capacitance (pF)	2.0-1200	27-3000	36-4300

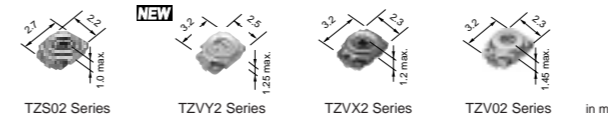
Medium-Voltage Chip Monolithic Ceramic Capacitor



● GHM1500 Series (for Base Station)

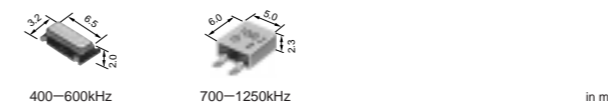
Temp. Char.	B	
DC Rated Voltage (V)	250	630
Capacitance (pF)	1000-470000	1000-220000
Chip Size L×W	2.0×1.25-5.7×5.0mm	3.2×1.6-5.7×5.0mm

Chip Trimmer Capacitors



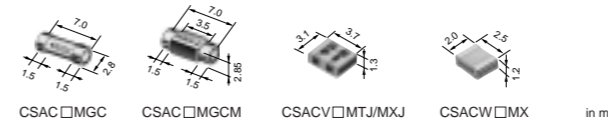
Series	Temp. Coeff. (ppm/°C)			
	NPO (0)	N750 (-750)	N1000 (-1000)	N1200 (-1200)
TZS02	6, 10	20	-	-
TZVY2	3, 6, 10	20, 25	45	-
TZV02, TZVX2	2.5, 3, 6, 10	20	-	-
TZC03	3, 6	10	-	20, 30
TZBX4	3, 6, 10, 25	20, 50	-	30, 40

Ceramic Resonators (CERALOCK®)



● CSKCC/CSBF Series (400-600kHz, 700-1250kHz)

Series	Frequency Range (kHz)	Frequency Accuracy (25°C)	Stability in Temperature (-20°C to +80°C)
CSKCC□E	400-600	±0.5%	±0.5%
CSBF□J	700-1250	±0.5%	±0.3%



● CSAC/CSACV/CSACW Series (1.80-60.00MHz)

Series	Frequency Range (MHz)	Frequency Accuracy (25°C)	Stability in Temperature (-20°C to +80°C)
CSAC□MGC/MGCM	1.80-6.00	±0.5%	±0.3%
CSACV□MTJ	6.01-13.0	±0.5%	±0.5%
CSACV□MXJ	13.50-15.99	±0.5%	±0.3%
CSACW□MX	16.00-60.00	±0.5%	±0.2%

● Thickness varies with frequency.



● Built-in Capacitor CSTCC/CSTCV/CSTCW Series (2.00-60.00MHz)

Series	Frequency Range (MHz)	Frequency Accuracy (25°C)	Stability in Temperature (-20°C to +80°C)
CSTCC□MG	2.00-10.00	±0.5%	±0.3%*3
CSTCV□MTJ	10.01-13.0	±0.5%	±0.4%
CSTCV□MXJ040	13.50-15.99	±0.5%	±0.3%
CSTCW□MX	16.00-60.00	±0.5%	±0.2%

*1 Thickness varies with frequency.
*2 Thickness varies with frequency and built-in capacitances.
*3 Stability in temperature varies with built-in capacitances.

Chip Coils



● Monolithic Type

Series	Inductance (nH)	Q (min.) at 100MHz	Allowable Current (mA)
LQG10A	1.2-33	8	200
LQG11A	1.2-100	12	300



● Thin-film Type

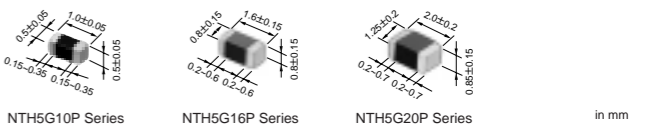
Series	Inductance (nH)	Q (min.) at 500MHz	Allowable Current (mA)
LQP10A	10-33	13	60-400
LQP11A	1.3-100	17	50-300



● Winding Type

Series	Inductance (nH)	Q (min.)	Allowable Current (mA)
LQW1608A	3.6-220	25-40	120-850
LQN21A	3.3-470	15-40	160-910

Chip NTC Thermistors

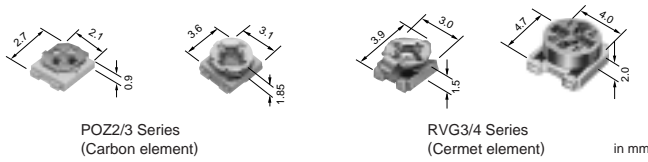


● NTH5G Series

Type	Resistance (25°C)	Rated Electric Power (mW)
NTH5G10P	220Ω-470kΩ	100
NTH5G16P	220Ω-470kΩ	100
NTH5G20P	220Ω-100kΩ	200

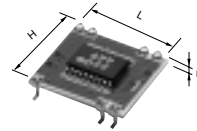
● Resistance Tolerance : ±5%, ±10%

Trimmer Potentiometers



Series	Power Rating (W)	Resistance Range	TCR (ppm/°C)
POZ2	0.1 (50°C)	500Ω–1MΩ	±500
POZ3		200Ω–2MΩ	
RVG3	0.1 (70°C)	100Ω–2MΩ	±250
RVG4M08		200Ω–2MΩ	
RVG4M58	0.25 (70°C)	100Ω–2MΩ	±100 (200Ω–50kΩ) ±150 (100Ω, 100kΩ min.)

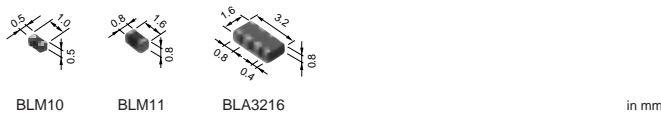
High Frequency Active Filter



Part Number	Application	Filter Characteristics	Dimensions (mm)		
			L	H	T
*AFL713YL2500KK1	CDMA Base Station	2.5MHz LPF	13.1	12.7	4.7
*AFL713YL5MK1	CDMA Base Station	5MHz LPF	13.1	12.7	4.7
AFL78YL615KK1	CDMA Base Station	615kHz LPF	13.1	12.7	4.7
AFE32YL315KA1	CDMA Base Station	315kHz Equalizer	13.1	12.7	4.7

* Under development.

Chip Ferrite Beads (EMIFIL®)



● BLM10 Series

Series	Impedance (Typ.) at 100MHz (Ω)	Rated Current (mA)
BLM10A	10–1000	50–500
BLM10B	75–1000	50–100

● BLM11 Series

Series	Impedance (Typ.) at 100MHz (Ω)	Rated Current (mA)
BLM11P	30–60	500–1000
BLM11A	120–1000	100–200
BLM11B	5–2500	50–700
BLM11HA	470–1000	100–200
BLM11HB	470–1000	50–100

● Chip Ferrite Beads Arrays BLA3216 Series

Series	Impedance (Typ.) at 100MHz (Ω)	Rated Current (mA)	Circuit
BLA3216A	30–1000	50–200	4
BLA3216B	120–600	100–150	

Built-in Capacitor Chip EMIFIL®



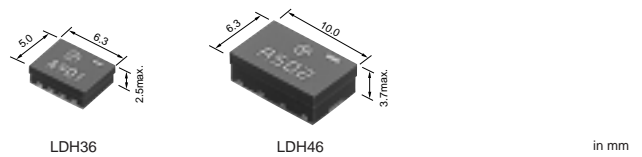
● NFM2012P Series for Large Current

Series	Capacitance	Rated Voltage (Vdc)	Rated Current (Adc)
NFM2012P	0.1–1μF	10–16	2–4

● NFM60R Series for Large Current T-type

Series	Capacitance (pF)	Rated Voltage (Vdc)	Rated Current (A)	Temperature Range (°C)
NFM60R	22–2200	25	6	–40 to +85

Chip Multilayer Delay Line



Series	Application	Delay Time
LDH36	Base Station	0.1–1.0ns
LDH46	Base Station	0.5–5.0ns

Equivalent electrical and
magnetic characteristics to a human.

DRY PHANTOM

Enables the measurement of antenna propagation characteristics under the same conditions as human use.

The Dry Phantom, which is made of newly developed complex dielectric materials, has the same electrical characteristics as a human. The Dry Phantom is manufactured using Murata's original and advanced technology of material and ceramic processing. Compared with conventional sol-gel or sodium chloride water types, the Dry Phantom has better stability and is more easily handled.

DRY PHANTOM

PHA-H07-46045-0150-003



Electric Characteristics

- Relative Dielectric Constant
46±7 (at 25°C 1.5GHz)
- Loss Tangent
0.45±0.15 (at 25°C 1.5GHz)

Features

- 1** The same dielectric characteristics as a human. Manufactured using newly developed complex dielectric materials containing Murata ceramic powder, polymer and carbon powder.
- 2** Enables measurements to be easily made. Stable conditions similar to the human body which has reflection, absorption and dissipation of electromagnetic waves.
- 3** Very good long term stability due to the solid dry material.
- 4** Easily handled and stored compared with conventional sol-gel or water types.

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- ② Aerospace equipment
- ③ Undersea equipment
- ④ Power plant equipment
- ⑤ Medical equipment
- ⑥ Transportation equipment (vehicles, trains, ships, etc.)
- ⑦ Traffic signal equipment
- ⑧ Disaster prevention / crime prevention equipment
- ⑨ Data-processing equipment
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