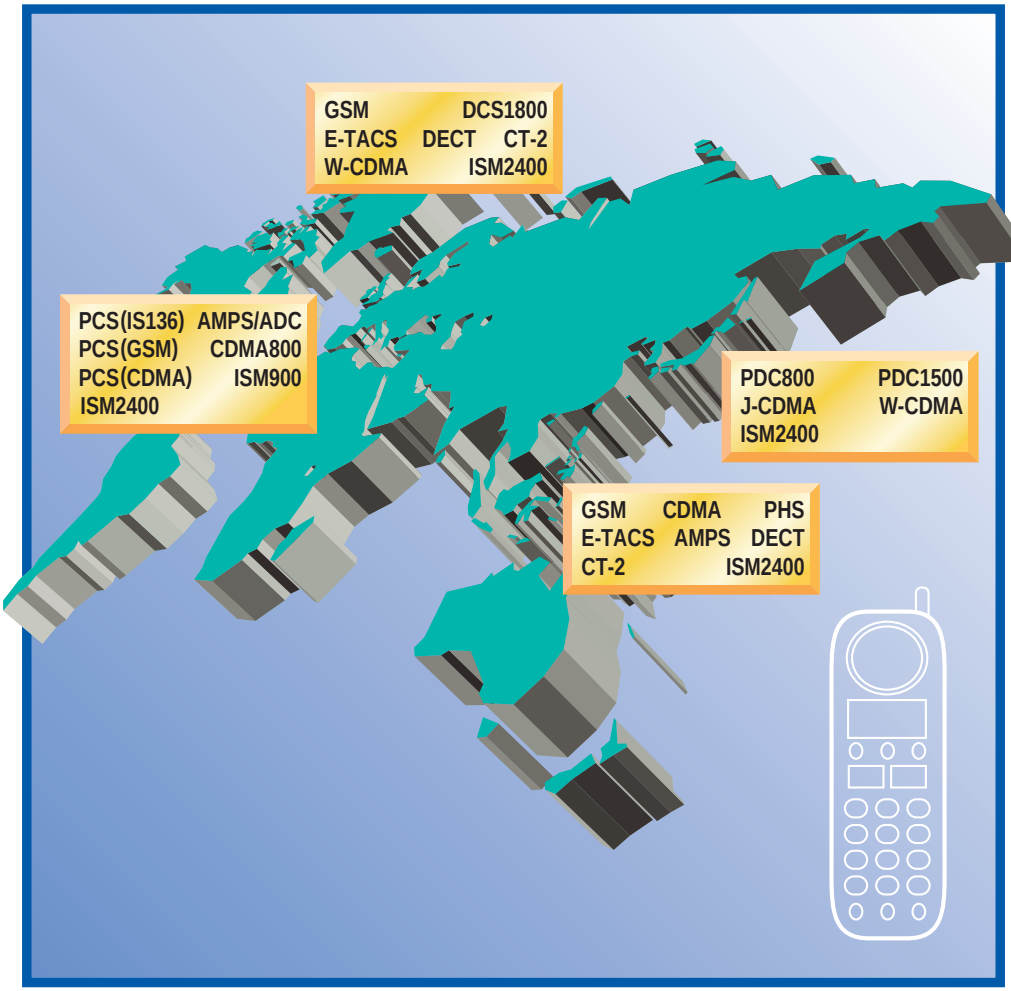
Murata Products for Mobile Communications

muRata

Innovator in Electronics



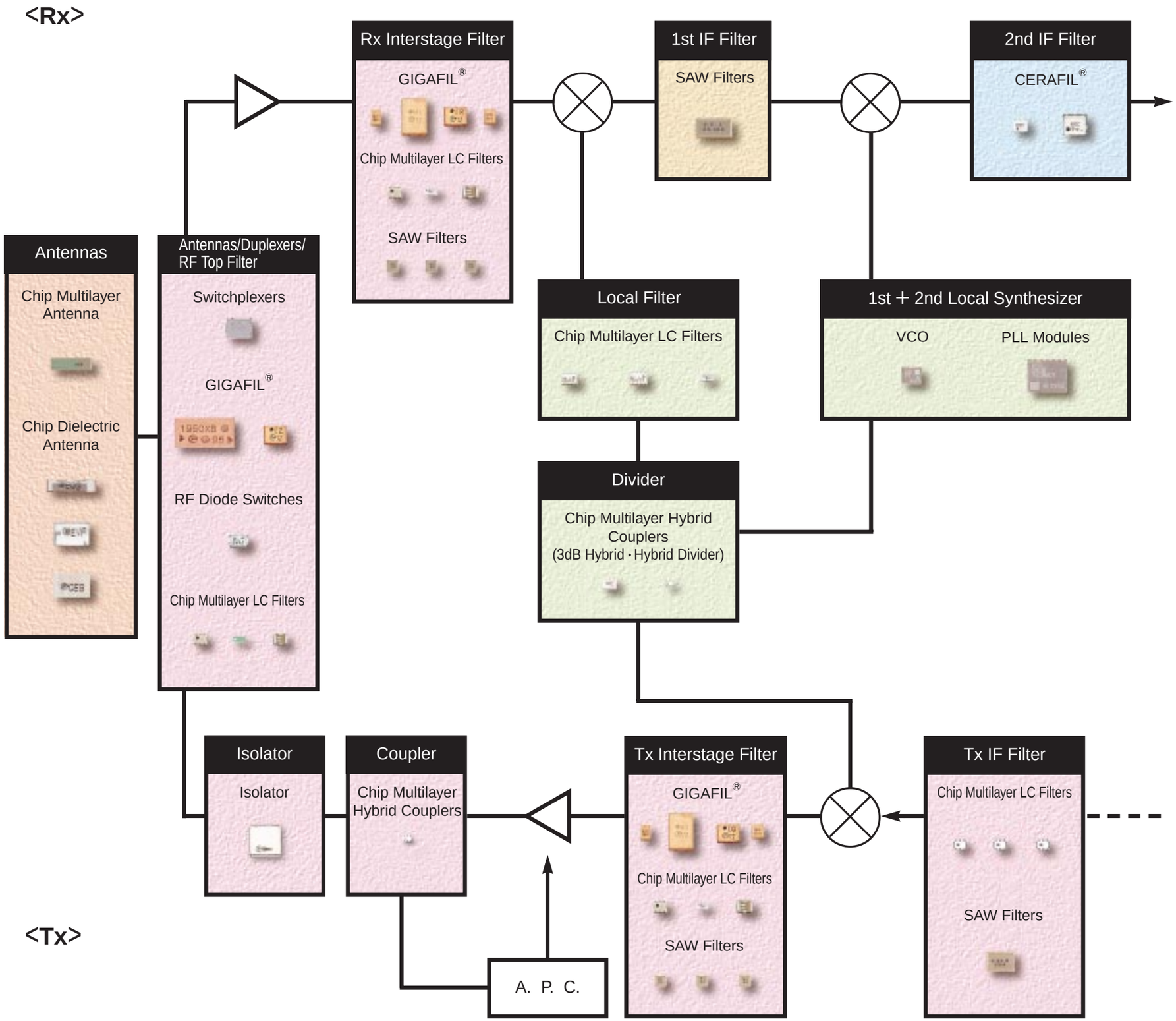
Meet the Needs Around the World

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	GSM:890–915 DCS1800:1710–1785	890–915	1850–1910	824–849	940–960 / 1429–1453	887–925	1920–1980	1880–1900	Europe, U.S.A:2400–2483.5*
	Rx	GSM:935–960 DCS1800:1805–1880	935–960	1930–1990	869–894	810–830 / 1477–1501	832–870	2110–2170		Japan:2471–2497
RF	Switchplexers/ RF Diode Switches/ GIGAFIL® (Duplexers)/ Chip Multilayer Diplexers	LMC36-07A05 Series DP Series LFDP15 Series	LMS30 Series KB Type	KB Type	GB Type DP Series	LMS36A Series DP Series	DP Series (Siftable Type)	KB Type	LMS33L Series	LMS30C Series
	GIGAFIL® (BPF)	MB Series	MB Series (BEF) DP 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		
	Chip Multilayer LC Filters (LPF)	LFTC15 Series	LFTC15 Series	LFTC15 Series		LFTC15/10 Series		LFTC10 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 LFSP20 Series	LFSE25 Series LFSP20 Series	LFSN25 Series LFSP20 Series LFSG20 Series LFJ30-04 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
	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
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	
	Microwave Oscillators (VCOs)	MQW Series	MQE9 Series	MQK Series	MQK/MQE9 Series	MQL Series	MQL Series	MQL Series		
	PLL Modules (HFQ～) / TCXO (HFX～)			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



Contents

TOPICS

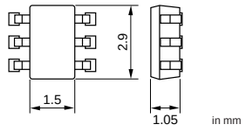
GaAs MMIC

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.

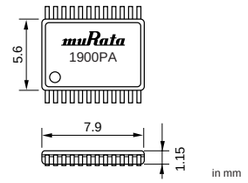
ALL the ICs operate by 3V single voltage supply, and operate in low current consumption.

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 Diplexers	**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
		LFSA25-12B0902B		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)	F_1 ±12.5	0.9	2.0	3.2×2.5×1.7 max. Unbalance Impedance:50Ω(Nominal) Balance Impedance:50Ω(Nominal)
			1842.5(F_2)	F_2 ±37.5	1.4		

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)	6.6×13.5×3.9 max.
	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: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.
	Mutilayer 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®	**CFECV13.0ME21**	13.000 (Fn)	Fn ±90 min. (2dB BW)	6.0 (Minimum Point)	1.0 (within Fn ±90kHz)	1.5 (Fn ±90kHz)	25 (Fn ±400kHz) 35 (Fn ±600kHz)	6.9×2.9×1.5 Input Output Impedance: 330Ω
		CFECS13.0ME22	13.000 (Fn)	Fn ±90 min. (1dB BW)	6.0 (Minimum Point)	1.0 (within Fn ±90kHz)	1.5 (Fn ±90kHz)	25 (Fn ±400kHz) 35 (Fn ±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	836.5	25	3	1	2	12 (869–894)	8.3×8.2×3 max.
	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	**SAFC836.5MC90T**	836.5	F_0 ±12.5	3.8	1.8	2.0	25 (869–894)	3.0×3.0×1.4 max. Input Output Impedance: 50Ω
Filters(Rx)	GIGAFIL®	**DFC2R881P025HHD**	881.5	25	2.6	1.2	2.3	9 (824–849)	5.8×8.2×3.0 max.
		DFC3R881P025HHD	881.5	25	3.0	1.0	2.0	15 (824–849)	8.3×8.2×3 max.
	Multilayer LC Filters	**LFSA25-12B0881B**	881.5	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	**SAFC881.5MC90T**	881.5	F_0 ±12.5	3.5	1.5	2.0	30 (824–849)	3.0×3.0×1.4 max. Input Output Impedance: 50Ω

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 (Fn)	Fn ±15.0 kHz min. (6dB BW)	5.0 (at Fn)	0.5 (within Fn ±12kHz)	25 (within Fn ±12kHz)	47 (within Fn ±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	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 (Fn) (kHz)	Fn±9.0− 12.0kHz (3dB BW)	6.0 (at Fn)	0.5 (within Fn ±10.5kHz)	27.0 (within Fn ±10.5kHz)	47 (within Fn ±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 ANT2→Rx:0.8	—	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:35dBm
			1489.0	F_R ±12.0			2.0		
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)	Fn ±9.0–12.0kHz (3dB BW)	6.0 (at Fn)	0.5 (within Fn ±10.5kHz)	27.0 (within Fn ±10.5kHz)	47 (within Fn ±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 ($2\times F_T$,$3\times F_T$)	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 ($2\times(F_0$ ±10)), 25.0 ($3\times(F_0$ ±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. ($2\times(F_0$±30.0)MHz), 22.0dB min. ($3\times(F_0$±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 Impedunce: 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 Rx: 1.2	− −	2.0	−	4.9×3.2×2.0 max. Power Capacity:27dBm
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.

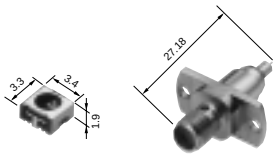
Block	Products	Parts Numbers	Center Frequency F_0 (MHz)	Band Width (MHz)	Insertion Loss in BW (dB max.)	VSWR in BW (max.)	Size (mm) / Others
Couplers	Hybrid Couplers	**LDC15B150J2450**	2450.0	F_0 ±50.0	0.35	1.2	2.0×1.25×1.05 max. Coupling:15.8dB±1.0
Baluns	Hybrid Baluns	**LDB15C101A2400**	2400.0	F_0 ±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

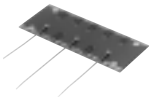
Murata Products for Mobile Communications

Microwave Coaxial Connectors



SWC Type

FSC Type

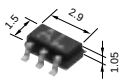


GSC Type

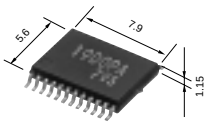
in mm

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



XM2400LB-PM0601

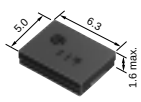


XM1900PA-PT2401

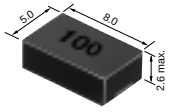
in mm

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_P_{1dB}=20.5dBm PA_G_P=36dB LNA_F=2.0dB SW_IL=0.7dB

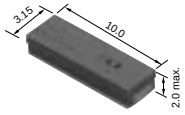
Antennas



LDA36 Type



LDA40 Type



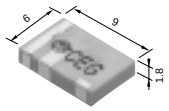
LDA42 Type

in mm

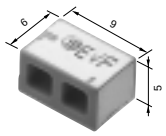
● Chip Multilayer Antennas

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

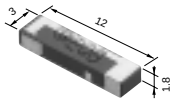
● Frequency is changed with layout patterning of PCB.
Please consult with us for appropriate design.



ANCLC



ANCGC



ANCKC

in mm

● 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®)

DRD Type

DRT Type

● 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

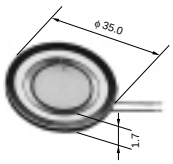
DRR copper plated type

DRR silver plated type

● 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®)



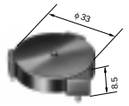
in mm

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

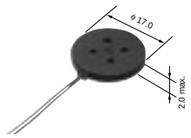
Piezoelectric Ringers (PIEZORINGER®)



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	DC25
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	DC25	DC16	DC10
Capacitance (pF)	220—3900	4700—6800	8200, 10000	27000—47000

TC	X5R	
Rated Voltage (V)	DC16	DC10
Capacitance (pF)	12000—22000	56000—100000

TC	Y5V		
Rated Voltage (V)	DC50	DC25	DC16
Capacitance (pF)	2200—15000	22000	33000—100000

● High-Cap. Series

Capacitance (μF)

Parts Number	TC / Rated Voltage (V) / Size (mm)	X7R			X5R		
		DC50	DC25	DC16	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	10
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	C0G
Rated Voltage (V)	DC50
Capacitance (pF)	0.5—20

High Frequency Monolithic Ceramic Capacitors

● High-Frequency Series

Capacitance (pF)

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

Capacitance (pF)

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

Capacitance (pF)

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

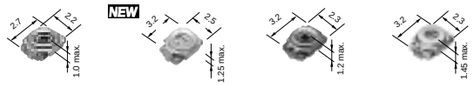
TC	B	F	YFD
Capacitance (pF)	2.0—1200	27—3000	36—4300

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

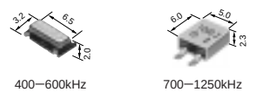


TZS02 Series TZVY2 Series TZVX2 Series TZV02 Series

in mm

Series	Maximum Capacitance (pF)			
	Temp. Coeff. (ppm/°C)			
	NP0 (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®)

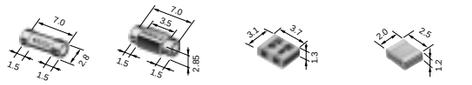


400—600kHz 700—1250kHz

in mm

● 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%



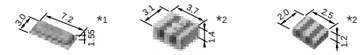
CSAC□MGC CSAC□MGCM CSACV□MTJ/MXJ CSACW□MX

in mm

● 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.



CSTCC□MG *1 CSTCV□MTJ/MXJ *2 CSTCW□MX *2

in mm

● 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.

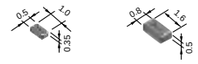
Chip Coils

LQG10A LQG11A

in mm

● Monolithic Type

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

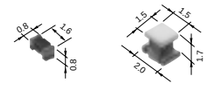


LQP10A LQP11A

in mm

● 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



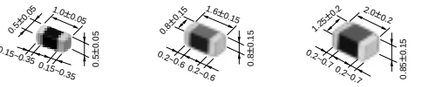
LQW1608A LQN21A

in mm

● 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



NTH5G10P Series NTH5G16P Series NTH5G20P Series

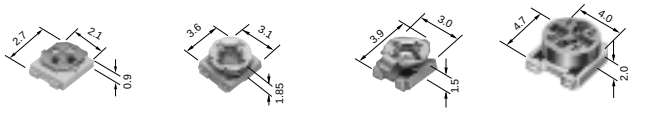
in mm

● 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



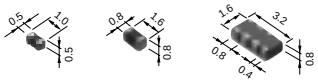
POZ2/3 Series (Carbon element)

RVG3/4 Series (Cermet element)

in mm

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.)

Chip Ferrite Beads (EMIFIL®)



BLM10 BLM11 BLA3216

in mm

● **BLM10 Series**

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

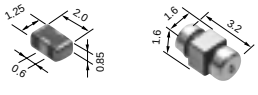
● **BLM11 Series**

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 NFM60R

in mm

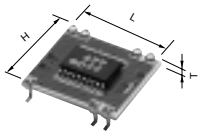
● **NFM2012P Series for Large Current**

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

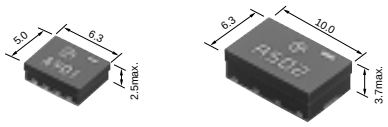
High Frequency Active Filter



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 Multilayer Delay Line



LDH36 LDH46

in mm

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.

MEMO

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   ① Aircraft equipment
   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
   ⑩ Application of similar complexity and/or reliability requirements to the applications listed in the above
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