

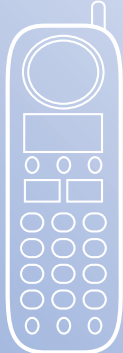
# Murata Products for Mobile Communications



*Innovator in Electronics*

The image shows a stylized world map with callout boxes listing Murata products for various regions. The callout boxes are as follows:

- Top Center:** GSM, DCS1800, 2.4GHz W-LAN, 5GHz W-LAN, GSM/DCS, W-CDMA, DECT, CT-2
- Left Side:** PCS(IS136), CDMA-800, ISM900, PCS(GSM), PCS(CDMA), 2.4GHz W-LAN, Triple Mode Cellular
- Right Side:** PDC800, CDMA-800/J, W-CDMA, 5GHz W-LAN, PDC1500, PHS, 2.4GHz W-LAN
- Bottom Center:** GSM, PHS, 2.4GHz W-LAN, 5GHz W-LAN, GSM/DCS, AMPS, DECT, GSM/DCS, CDMA-800, CT-2



# Meet the Needs Around the World

System		Triple Mode Cellular	GSM/DCS Dual Band	GSM	W-CDMA	CDMA-800	PDC800/1500	DECT	2.4GHz W-LAN	5GHz W-LAN	
Area		U.S.A.	Europe, Asia	Europe, Asia	Japan, Europe	Japan, Korea	Japan	Europe, Hong Kong	Global	Global	
Channel Multiplexing Method		CDMA/TDMA	TDMA	TDMA	CDMA	CDMA	TDMA	TDMA	SS	CSMA (OFDM)	
Frequency (MHz)		Tx Rx	AMPS:824-849 PCS:1820-1910 GSM:890-915 DCS1800:1710-1785 AMPS:869-894 PCS:1930-1990 GSM:935-960 DCS1800:1805-1880	890-915 935-960	1920-1980 2110-2170	887-925*1 832-870*1	940-960/1429-1453 810-830/1477-1501	1880-1900	2400-2483.5*2	5150-5350	
RF	SWITCHPLEXER®/ RF Diode Switches/ GIGAFIL® (Duplexers)/ Chip Multilayer Diplexers	KB Type LFD21/DP Series	LMSP65 Series LFD21/DP Series	LMSW43L Series KB Type	KB Type	DP Series (Siftable Type) /KB Type	DP Series		LMSW43C Series	LMSW43C Series	
	GIGAFIL® (BPF)	MB Series	MB Series	MB Series (BEF) DP Series	MB Series		MB Series	MB Series	MB Series	MB Series	
	SAW Filters	SAFC Series	SAFC Series	SAFC Series	SAFS Series	SAFS/SAFC Series	SAFS/SAFC Series				
	Chip Multilayer LC Filters (LPF)	LFL21/TC Series	LFL18/TC Series	LFL18/TC Series	LFL18/TC Series		LFL18/TC Series	LFL21/TC Series	LFL21/TC Series		
	Chip Multilayer LC Filters (BPF)	LFB32/SA, LFB32/SN Series	LFB32/SA, LFB32/SN Series	LFB32/SA Series	LFB31/SG Series	LFB32/SA Series	LFB31/SL, LFB32/SA Series	LFB31/SP Series	LFB32/SN, LFB31/SP Series	LFB31/SG Series	LFB31/SN Series
	Isolators/Circulators	CE040/053 Series	CE040/053 Series	CE053 Series	CE040 Series	CE053 Series	CE053/052 Series	CE073 Series CE07A Series			
	Chip Multilayer Hybrid Couplers (Directional Couplers)	LDC18 Series	LDC18 Series	LDC18 Series	LDC18 Series	LDC18 Series	LDC18/21 Series	LDC21 Series	LDC18 Series		
	Chip Multilayer Hybrid Baluns	LDB21 Series	LDB21 Series	LDB21 Series	LDB21 Series	LDB21 Series	LDB21 Series	LDB21 Series	LDB21 Series		
Mixer	Chip Multilayer Hybrid Couplers (3dB Hybrid · Hybrid Divider)	LDD21 Series	LDC32/LDD21 Series	LDC32 Series	LDD21 Series	LDD21 Series	LDC32/LDD21 Series	LDD21 Series			
	Microwave Oscillators (VCOs)	MQW Series	MQW/MQE9 Series	MQE9 Series	MQL Series	MQL Series	MQL Series		MQL Series		
	PLL Modules (HFQ~)	HFQW Series			HFQD Series	HFQC Series	HFQD Series		HFQS Series	HFQS Series	
1st IF	SAW Filters/ Chip Multilayer LC Filters	LFB32/SQ Series SAFC Series	SAFC Series	SAFC Series	SAFC Series	LFB32/SQ Series	SAFC Series	SAFU Series			
2nd IF	CERAFIL®	CFXCA Series	SFJCA Series SF ECS Series	SFJCA Series SF ECS Series			CFXCB Series				

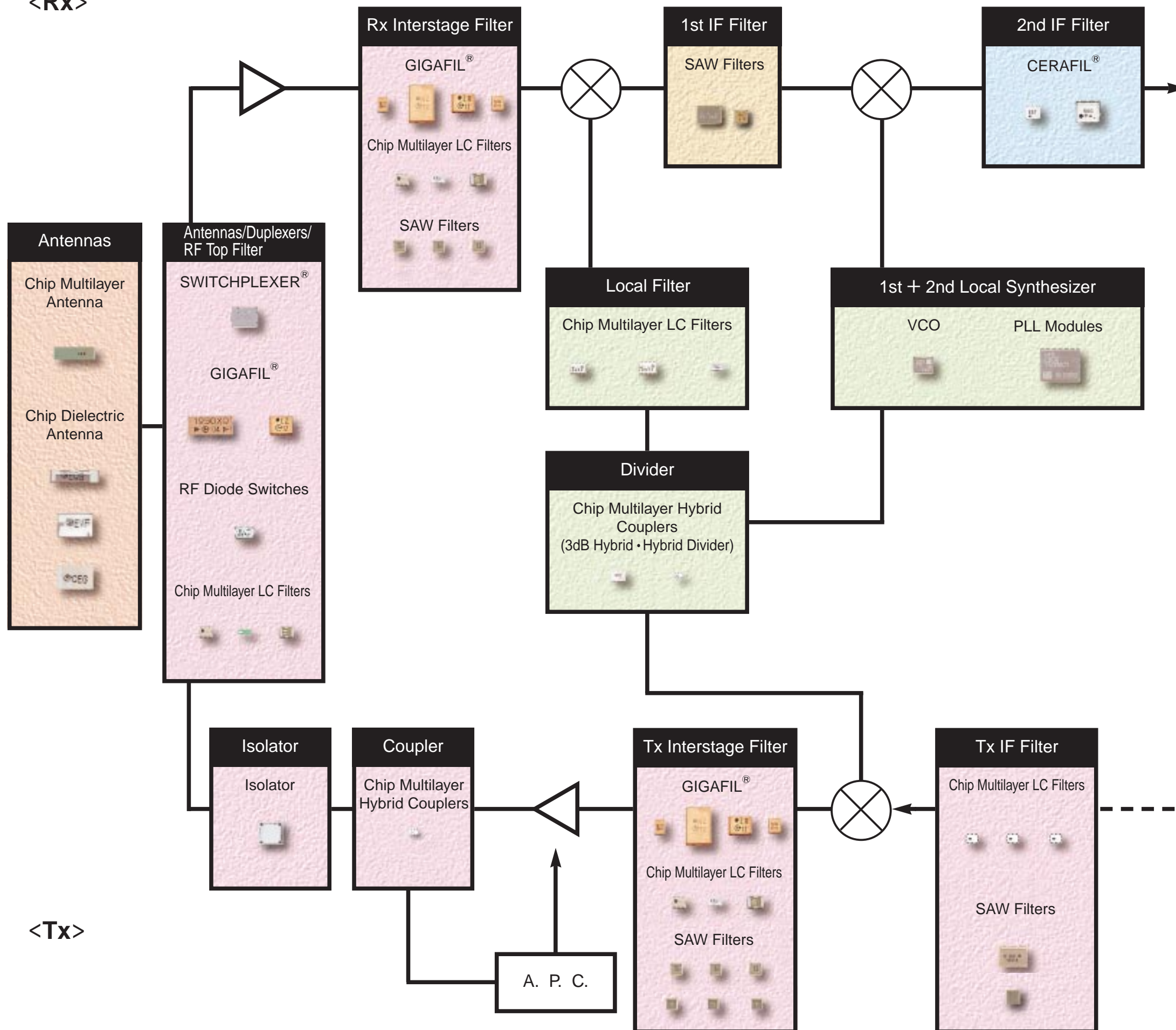
Actual Size : The sample units and data in this catalog are only reference, which contains some provisional specifications.

\*1 Frequency at Japan  
Frequency at Korea Tx:824-849/1710-1780  
Rx:869-894/1800-1870

\*2 except France, Spain

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

<Rx>



<Tx>

## Contents

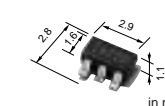
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All the Part Numbers given in the text and specification tables of this catalog are "Global Part Numbers" that will be adopted from June 2001. If you have any questions about adoption of the Global Part Numbers, inquire at your usual Murata sales office or distributor.

## TOPICS

### GaAs MMIC

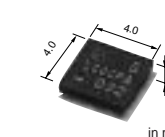
#### XM5060SA-PM0601



A small SW for 5.2 / 5.8GHz band. Low insertion loss and high isolation are realized with low voltage operation.

Operation Frequency	5.15-5.35GHz / 5.725-5.82GHz
Operation Voltage	3V
Insertion Loss	1.2dB@5.2GHz / 5.8GHz (Typ.)
Isolation (ANT-PORT1/2)	15dB@5.2GHz / 5.8GHz (Typ.)

#### XM5060PA-S02501



A high-gain PA that enables low voltage and low current consumption operation in 5.2 / 5.8GHz band. The package is small and thin leadless type.

Operation Frequency	5.2GHz/5.8GHz	
Operation Voltage	3V	
1dB Compression Point	22.5dBm (Typ.)	
Saturation Power	24.5dBm@5.2GHz/23.5dBm@5.8GHz (Typ.)	
Power Gain	5.2GHz	29.5dB@P1dB/21.0dB@Psat (Typ.)
	5.8GHz	26.5dB@P1dB/21.0dB@Psat (Typ.)
Current Consumption	5.2GHz	180mA@P1dB/220mA@Psat (Typ.)
	5.8GHz	150mA@P1dB/170mA@Psat (Typ.)

# for Triple Mode Cellular (CDMA/TDMA) Tx/AMPS:824-849MHz, CDMA:824-849MHz, PCS:1820-1910MHz,

Rx/AMPS:869-894MHz, CDMA:869-894MHz, PCS:1930-1990MHz

## RF / LO

Block	Products	Part Number	Center Frequency F <sub>0</sub> (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 <sup>®</sup>	DFYK91G88LEHAC	1880.0	F <sub>T</sub> ±30.0	3.4	2.6	1.8	40 (F <sub>R</sub> ±30.0)	24.7×8×3.9 max.
			1960.0	F <sub>R</sub> ±30.0	4.6	3.4	2.0	53 (F <sub>T</sub> ±30.0)	
	Multilayer Diplexers	LFD21859MDP1A049	1920.0 (F <sub>1</sub> )	F <sub>1</sub> ±70.0	0.45	—	1.7	19.0 (F <sub>2</sub> )	2.0×1.25×1.05 max. Power Capacity:3.0W
			859.0 (F <sub>2</sub> )	F <sub>2</sub> ±35.0	0.4	—		20.0 (F <sub>1</sub> )	
Filters(Tx)	GIGAFIL <sup>®</sup>	DFCB21G88LDJAA	1880.0	F <sub>0</sub> ±30.0	1.5	0.5	2.0	40 (1480)	4.8×4.3×3 max.
		DFCB31G88LDJAA	1880.0	F <sub>0</sub> ±30.0	2.4	1.0	2.0	45 (1480)	7.5×4.3×3 max.
		DFCB31G88LBJAA	1880.0	F <sub>0</sub> ±30.0	3.7	2.0	3.0	5 (1930)	5.7×4.4×2 max.
	Multilayer LC Filters	LFB321G88SN1A545	1880.0	F <sub>0</sub> ±30.0	2.9	1.0	2.0	40.0 (1400) 36.0 (1640)	3.2×2.5×1.6 max. Impedance:50Ω(Nominal) Power Capacity:500mW
		LFL211G92TC1A060	1920.0	F <sub>0</sub> ±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:3W
		LFB32836MSA1-747	836.5	F <sub>0</sub> ±12.5	3.0	1.0	2.2	19.5 (F <sub>0</sub> ±77.5)	3.2×2.5×1.9 max. Impedance:50Ω(Nominal) Power Capacity:500mW
	SAW Filters	SAWCD1G86QA0T00	1867.5 1897.5	F <sub>0</sub> ±17.5 F <sub>0</sub> ±12.5	3.2	2.0	2.0	32 (DPX Range)	3.0×3.0×1.15 max. (2 Filter in 1 Package)
		SAFCC1G88KA0T00	1880.0	F <sub>0</sub> ±30.0	4.5	3.0	2.5	8 (DPX Range)	3.0×3.0×1.15 max.
		SAFCC836MKA0T00	836.5	F <sub>0</sub> ±12.0	3.5	2.0	2.0	32 (DPX Range)	3.0×3.0×1.15 max.
Filters(Rx)	GIGAFIL <sup>®</sup>	DFCB21G96LDJAA	1960.0	F <sub>0</sub> ±30.0	1.5	0.5	2.0	40 (1560)	4.8×4.3×3 max.
		DFCB31G96LDJAA	1960.0	F <sub>0</sub> ±30.0	2.4	1.0	2.0	45 (1560)	7.5×4.3×3 max.
		DFCB31G96LBJAA	1960.0	F <sub>0</sub> ±30.0	3.7	2.0	3.0	5 (1910)	5.7×4.4×2 max.
	Multilayer LC Filters	LFB32881MSA1-781	881.5	F <sub>0</sub> ±12.5	3.2	1.0	2.2	20.0 (804) 20.0 (959)	3.2×2.5×1.9 max. Impedance:50Ω(Nominal) Power Capacity:500mW
		SAFCC1G96KA0T00	1960.0	F <sub>0</sub> ±30.0	4.5	3.0	2.5	15 (DPX Range)	3.0×3.0×1.15 max.
	SAW Filters	SAFSG881MAL0T00	881.5	F <sub>0</sub> ±12.0	3.8	2.0	2.2	35 (DPX Range)	2.5×2.0×1.1 max.

Block	Products	Part Number	Center Frequency F <sub>0</sub> (MHz)	Band Width (MHz)	Insertion Loss in BW (dB max.)	VSWR in BW (max.)	Size (mm) / Others
Couplers	Hybrid Couplers	LDC181G8819B-327	1880.0	F <sub>0</sub> ±30.0	0.27	1.3	1.6×0.8×0.7 max. Coupling:19.5dB±1.0
		LDC18836M20B-320	836.5	F <sub>0</sub> ±12.5	0.21	1.3	1.6×0.8×0.7 max. Coupling:20.6dB±1.0
Baluns	Hybrid Baluns	LDB211G9020C-001	1900.0	F <sub>0</sub> ±100	0.8	2.0	2.0×1.25×1.05 max. Unbalance Impedance:50Ω(Nominal) Balance Impedance:200Ω(Nominal)
		LDB21836M20C-001	836.5	F <sub>0</sub> ±12.5	1.0	2.0	2.0×1.25×1.05 max. Unbalance Impedance:50Ω(Nominal) Balance Impedance:200Ω(Nominal)
		LDB21881M05C-001	881.5	F <sub>0</sub> ±12.5	1.4	2.0	2.0×1.25×1.05 max. Unbalance Impedance:50Ω(Nominal) Balance Impedance:50Ω(Nominal)
Isolators	Isolators	CE0401G88DCB000TT1	1880.0	F <sub>0</sub> ±30.0	0.6	1.6	4×4×2.0 max. Isolation:14dB
		CE053836MDCB000TT1	836.5	F <sub>0</sub> ±12.5	0.65	1.5	5×5×2 max. Isolation:13dB

## Mixer

Block	Products	Part Number	Center Frequency F <sub>0</sub> (MHz)	Insertion Loss in BW (dB)	VSWR in BW (max.)	Amplitude Balance (dB max.)	Size (mm) / Others
Divider	Hybrid Divider	LDD21967M03A-068	697.0±13.0	3.4±0.4	1.5	—	2.0×1.25×1.05 max. Attenuation:12.0dB min. (2×(F <sub>0</sub> ±13.0)MHz), 22.0dB min. (3×(F <sub>0</sub> ±13.0)MHz)

Block	Products	Part Number	Frequency Range (MHz)	Supply Voltage (V)	Size (mm)
Synthesizer	VCO	MQW1 Series	954 to 980 +1720 to 1780	3.0	9.6×7.0×1.6
	PLL Modules	HFQW08 Series	954 to 980 +1720 to 1780	3.0	12.6×8.6×1.6

## IF

Block	Products	Part Number	Center Frequency F <sub>0</sub> (MHz)	Band Width (kHz) (from F <sub>0</sub> )	Insertion Loss at F <sub>0</sub> (dB max.)	Ripple in BW (dB max.)	GDT Deviation (μ sec. max.)	Attenuation (dB min.)	Size (mm) / Others
Tx IF Filters	SAW Filters	SAFCG130MCA0T00	130.38	±630	5.5	—	0.8 (F <sub>0</sub> ±630kHz)	40 (F <sub>0</sub> ±4.95MHz)	3.8×3.8×1.15 max. Balance Type Available
1st IF Filters	Multilayer LC Filters	LFB32130MSQ1A552	130.38	±0.65MHz	5.5	1.5 (in BW)	—	34.0 ((F <sub>0</sub> ±0.65)-45MHz) 18.0 ((F <sub>0</sub> ±0.65)+80MHz) 20.0 (2×(F <sub>0</sub> ±0.65)MHz) 27.0 (3×(F <sub>0</sub> ±0.65)MHz)	3.2×2.5×1.6 max. Balance Impedance (IN): 1000Ω (Nominal) Nominal Impedance (OUT): 50Ω (Nominal)
	SAW Filters	SAFCT85M3JB1X00	85.38	±12	5.5	1.5 (F <sub>0</sub> ±12kHz)	10 (F <sub>0</sub> ±10kHz)	20 (F <sub>0</sub> ±60kHz) 40 (F <sub>0</sub> ±120kHz)	7.0×5.0×1.8 max. Input Output Impedance: 870Ω/-1.8pF
2nd IF Filters	Ceramic Filters	CFXCA450KBFA-R1	450 (kHz)(F <sub>0</sub> )	±15 min. (6dB)	6.0	0.5 (F <sub>0</sub> ±10.0kHz)	15 (F <sub>0</sub> ±10.0kHz)	50 (F <sub>0</sub> ±100kHz)	6.5×6.5×2.0 Input Output Impedance: 2kΩ

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

DCS1800:1805-1880MHz

## RF / LO

Block	Products	Part Number	Center Frequency F <sub>0</sub> (MHz)	Band Width (MHz)	Insertion Loss (dB max.)	Ripple (dB max.)	VSWR (max.)	Attenuation (dB min.) ( ) MHz	Size (mm) / Others	
Antennas/ Duplexers	Multilayer Duplexers	LFD21920MDP1A048	1795.0 (F <sub>1</sub> )	F <sub>1</sub> ±85.0	0.55	—	1.8	20.0 (F <sub>2</sub> )	2.0×1.25×1.05 max. Power Capacity:3.0W	
			920.0 (F <sub>2</sub> )	F <sub>2</sub> ±40.0	0.50	—		16.0 (F <sub>1</sub> )		
	SWITCHPLEXER®	LMSP65AA-011	GSM Band 897.5	F <sub>T</sub> ±17.5	1.2	—	2.0	25.0 (2×F <sub>T</sub> )	6.7×5.0×2.0 max. Isolation:20.0dB min. Power Capacity: GSM Band: 35dBm DCS Band: 33dBm	
			942.5	F <sub>R</sub> ±17.5	1.0	—		25.0 (3×F <sub>T</sub> )		
DCS Band	1747.5	F <sub>T</sub> ±37.5	1.5	—	2.0	25.0 (2×F <sub>T</sub> )				
		1842.5	F <sub>R</sub> ±37.5	1.2		—	25.0 (3×F <sub>T</sub> )			
Filters (Tx)	Multilayer LC Filters	GIGAFIL®	DFCB31G74LBJAA	1747.5	F <sub>0</sub> ±37.5	3.5	2.0	3.0	5 (F <sub>0</sub> ±57.5)	5.7×4.6×2
			LFL18897MTC1A074	897.5	F <sub>0</sub> ±17.5	0.4	—	1.7	20.0 (2× (F <sub>0</sub> ±17.5)) 15.0 (3× (F <sub>0</sub> ±17.5))	1.6×0.8×0.7 max. Impedance:50Ω(Nominal) Power Capacity:3.0W
		LFB32902MSA1A536	902.5	F <sub>0</sub> ±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	
		LFB321G74SN1-770	1747.5	F <sub>0</sub> ±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®	DFCB31G84LBJAA	1842.5	F <sub>0</sub> ±37.5	3.5	2.0	3.0	5 (F <sub>0</sub> ±57.5)	5.7×4.6×2	
		DFCB31G84LBJAB	1842.5	F <sub>0</sub> ±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	LFB32947MSA1A537	947.5	F <sub>0</sub> ±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	
		LFB321G84SN1A541	1842.5	F <sub>0</sub> ±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	SAWCJ942MQA0T00	942.5	F <sub>0</sub> ±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 <sub>0</sub> ±37.5	4.2	2.5	2.7	7 (1705-1785)		

Block	Products	Part Number	Center Frequency F <sub>0</sub> (MHz)	Band Width (MHz)	Insertion Loss (dB max.)	VSWR (max.)	Size (mm) / Others
Couplers	Hybrid Couplers	LDC18897M14B-322	897.5	F <sub>0</sub> ±17.5	0.37	1.4	1.6×0.8×0.7 max. Coupling:14.0dB±1.0
		LDC181G7420B-327	1747.5	F <sub>0</sub> ±37.5	0.26	1.4	1.6×0.8×0.7 max. Coupling:20.0dB±1.0
	Couplers with Integrated LPF	LDC211G7420H-055	1747.5	F <sub>0</sub> ±37.5	0.45	1.4	2.0×1.25×1.05 max. Coupling:20.0dB±1.0 Attenuation:22.0dB min. (2×(F <sub>0</sub> ±37.5)MHz), 17.0dB min. (3×(F <sub>0</sub> ±37.5)MHz)
Baluns	Hybrid Baluns	LDB21942M05C-001	942.5	F <sub>0</sub> ±17.5	1.4	2.0	2.0×1.25×1.05 max. Unbalance Impedance:50Ω(Nominal) Balance Impedance:50Ω(Nominal)
		LDB211G8405C-001	1842.5	F <sub>0</sub> ±37.5	0.8	2.0	2.0×1.25×1.05 max. Unbalance Impedance:50Ω(Nominal) Balance Impedance:50Ω(Nominal)
Isolators	Isolators	CE053897MDCB000TT1	897.5	F <sub>0</sub> ±17.5	0.75	1.6	5.0×5.0×2.0 max. Isolation:12dB min.
		CE0401G74DCB000TT1	1747.5	F <sub>0</sub> ±37.5	0.7	1.6	4.0×4.0×2.0 max. Isolation:13dB min.

## Mixer

Block	Products	Part Number	Center Frequency F <sub>0</sub> (MHz)	Band Width (MHz)	Insertion Loss (dB max.)	VSWR (max.)	Amplitude Balance (dB max.)	Size (mm) / Others
Divider	3dB Hybrid	LDC32900M03B-703	900.0	F <sub>0</sub> ±100	3.3±0.5	1.5	1.0	3.2×2.5×1.0 max. Phase Deviation:90°±3.0
	Hybrid Divider	LDD211G6603A-096	1660.0	F <sub>0</sub> ±13.5	3.4±0.4	1.5	1.0	2.0×1.25×1.05 max. Attenuation:12.0dB min. (2×(F <sub>0</sub> ±13.5)MHz), 22.0dB min. (3×(F <sub>0</sub> ±13.5)MHz)

Block	Products	Part Number	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
		MQE95 Series	1285 to 1361+1445 to 1520	2.7	7.8×5.8×1.6
	Tx High Power VCO	MQW1 Series	880 to 915+1710 to 1785	2.7	9.6×7.0×1.6

## IF

Block	Products	Part Number	Center Frequency F <sub>0</sub> (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	SAFCJ225MRA0X01R11	225.0 (F <sub>0</sub> )	±80.0 (from F <sub>0</sub> )	9.0 (F <sub>0</sub> ) *	1.5	2.0 (F <sub>0</sub> ± 80kHz)	30 (F <sub>0</sub> ± 400kHz) 40 (F <sub>0</sub> ± 600kHz)	3.8×3.8×1.5 max. Input Output Impedance: input:700 Ω//—1.3pF output:760 Ω//—1.1pF
2nd IF Filters	CERAFIL®	SFJCA6M00UF00-R1	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
		SFECS13M0SF0023-R0	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

\* include matching circuit

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

## RF / LO

Block	Products	Part Number	Center Frequency F <sub>0</sub> (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 <sup>®</sup>	DFYG6902MLEJAA	902.5	F <sub>T</sub> ±12.5	2.1	1.4	1.7	20 (F <sub>R</sub> ±12.5)	14×7.6×4 max.
			947.5	F <sub>R</sub> ±12.5	3.2	1.4	1.8	30 (F <sub>T</sub> ±12.5)	
	RF Diode Switches	LMSW43LA-206	897.5	F <sub>T</sub> ±17.5	0.9	—	2.0	25 ((F <sub>T</sub> ×2)±(BW/2×2)), 25 ((F <sub>T</sub> ×3)±(BW/2×3))	4.9×3.2×2.0 max. Isolation:20.0dB min. Power Capacity:35dBm
			942.5	F <sub>R</sub> ±17.5	1.0	—	2.0		
Filters(Tx)	GIGAFIL <sup>®</sup>	DFCB2902MLDJAA	902.5	F <sub>0</sub> ±12.5	2.6	1.2	2.3	6.5 (F <sub>0</sub> +32.5)	5.8×8.2×3.0 max.
	Multilayer LC Filters	LFL18897MTC1A074	897.5	F <sub>0</sub> ±17.5	0.4	—	1.7	20.0 (2×(F <sub>0</sub> ±17.5)), 15.0 (3×(F <sub>0</sub> ±17.5))	1.6×0.8×0.7 max. Impedance:50Ω(Nominal) Power Capacity:3W
	SAW Filters	SAFCC897MKA0T00	897.5	F <sub>0</sub> ±17.5	3.2	1.8	2.2	20 (935–960)	3.0×3.0×1.15 max. Input Output Impedance: 50Ω
Filters(Rx)	GIGAFIL <sup>®</sup>	DFCB2947MLDJAA	947.5	F <sub>0</sub> ±12.5	2.6	1.2	2.3	9 (F <sub>0</sub> –32.5)	5.8×8.2×3.0 max.
	Multilayer LC Filters	LFB32947MSA1A537	947.5	F <sub>0</sub> ±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	SAFCC942MAM0T00	942.5	F <sub>0</sub> ±17.5	4.2	2.5	2.4	14 (905–915)	3.0×3.0×1.15 max. Input Output Impedance: 50Ω

Block	Products	Part Number	Center Frequency F <sub>0</sub> (MHz)	Band Width (MHz)	Insertion Loss in BW (dB max.)	VSWR in BW (max.)	Size (mm) / Others
Couplers	Hybrid Couplers	LDC18897M14B-322	897.5	F <sub>0</sub> ±17.5	0.18	1.4	2.0×1.25×1.05 max. Coupling:20.0dB±1.0
Baluns	Hybrid Baluns	LDB21942M05C-001	942.5	F <sub>0</sub> ±17.5	1.4	2.0	2.0×1.25×1.05 max. Unbalance Impedance:50Ω(Nominal) Balance Impedance:50Ω(Nominal)
Isolators	Isolators	CE053897MDCB000TT1	897.5	F <sub>0</sub> ±17.5	0.75	1.6	5.0×5.0×2.0 max. Isolation:12dB min.

## Mixer

Block	Products	Part Number	Center Frequency F <sub>0</sub> (MHz)	Insertion Loss in BW (dB)	VSWR in BW (max.)	Amplitude Balance (dB max.)	Size (mm) / Others
Divider	3dB 90° Hybrid	LDC32900M03B-703	800–1000	3.3±0.5	1.5	1.0	3.2×2.5×1.0 max. Phase Deviation:90°±3.0

Block	Products	Part Number	Frequency Range (MHz)	Supply Voltage (V)	Size (mm)
Synthesizer	VCO	MQE900 Series	880–915	3.0	7.8×5.8×1.8 max.

## IF

Block	Products	Part Number	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	SAFCJ225MRA0X01R11	225.0 (F <sub>0</sub> )	±80.0 (from F <sub>0</sub> )	9.0 (F <sub>0</sub> ) *	1.5	2.0 (F <sub>0</sub> ±80kHz)	30 (F <sub>0</sub> ±400kHz) 40 (F <sub>0</sub> ±600kHz)	3.8×3.8×1.5 max. Input Output Impedance: input:700Ω//–1.3pF output:760Ω//–1.1pF
2nd IF Filters	CERAFIL <sup>®</sup>	SFECV13M0SF0021-R0	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
		SFECS13M0SF0023-R0	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

\* include matching circuit

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

## RF / LO

Block	Products	Part Number	Center Frequency F <sub>0</sub> (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®	DFYK61G95LBNBB	1950	F <sub>T</sub> ±30	1.5	1.0	1.9	47 (F <sub>R</sub> ±30)	12.55×5.3×2 max.
			2140	F <sub>R</sub> ±30	2.4	1.0	2.0	49 (F <sub>T</sub> ±30)	
Top Filters	GIGAFIL®	DFCB22G14LBJAA	2140	F <sub>R</sub> ±30	2.7	1.2	2.0	26 (F <sub>T</sub> ±30)	4.4×4.0×2 max.
	Multilayer LC Filters	LFL18/TC Series	*	*	*	*	*	*	*
Interstage Filters	Multilayer LC Filters	LFB311G95SGA3HA564	1950.0	F <sub>0</sub> ±30.0	3.5	1.5	2.0	20.0 (2110–2170) 25.0 (2490–2550) 35.0 (3060–3120)	3.2×1.6×1.3 max. Impedance:50Ω(Nominal) Power Capacity:500mW
		LFB312G14SGA2HA565	2140.0	F <sub>0</sub> ±30.0	4.0	1.5	2.0	19.0 (1920–1980) 24.0 (2870–2930) 24.0 (2490–2550)	3.2×1.6×1.3 max. Impedance:50Ω(Nominal) Power Capacity:500mW
	GIGAFIL®	DFCB31G95LBJAA	1950	F <sub>T</sub> ±30	3.5	1.5	2.0	35 (F <sub>R</sub> ±30)	5.7×4.4×2 max.
		DFCB32G14LBJAA	2140	F <sub>R</sub> ±30	3.7	1.5	3.0	30 (F <sub>T</sub> ±30)	5.7×4.4×2 max.
	SAW Filters	SAFS1950 Series	1950	F <sub>0</sub> ±30	*	*	*	*	2.5×2.0×1.1 max.
		SAFS2140 Series	2140	F <sub>0</sub> ±30	*	*	*	*	2.5×2.0×1.1 max.

Block	Products	Part Number	Center Frequency F <sub>0</sub> (MHz)	Band Width (MHz)	Insertion Loss in BW (dB max.)	VSWR in BW (max.)	Size (mm) / Others
Couplers	Hybrid Couplers	LDC181G9519B-327	1950.0	F <sub>0</sub> ±30.0	0.27	1.3	1.6×0.8×0.7 max. / Coupling:19.3dB±1.0
Baluns	Hybrid Baluns	LDB211G9005C-001	1900.0	F <sub>0</sub> ±100.0	0.8	2.0	2.0×1.25×1.05 max. Unbalance Impedance:50Ω(Nominal) Balance Impedance:50Ω(Nominal)
		LDB211G9010C-001	1900.0	F <sub>0</sub> ±100.0	0.8	2.0	2.0×1.25×1.05 max. Unbalance Impedance:50Ω(Nominal) Balance Impedance:100Ω(Nominal)
		LDB211G9020C-001	1900.0	F <sub>0</sub> ±100.0	0.8	2.0	2.0×1.25×1.05 max. Unbalance Impedance:50Ω(Nominal) Balance Impedance:200Ω(Nominal)
		LDB212G1005C-001	2100.0	F <sub>0</sub> ±100.0	0.9	2.0	2.0×1.25×1.05 max. Unbalance Impedance:50Ω(Nominal) Balance Impedance:50Ω(Nominal)
		LDB212G1010C-001	2100.0	F <sub>0</sub> ±100.0	1.0	2.0	2.0×1.25×1.05 max. Unbalance Impedance:50Ω(Nominal) Balance Impedance:100Ω(Nominal)
		LDB212G1020C-001	2100.0	F <sub>0</sub> ±100.0	0.9	2.0	2.0×1.25×1.05 max. Unbalance Impedance:50Ω(Nominal) Balance Impedance:200Ω(Nominal)
Isolators	Isolators	CE0401G95DCB001TT1	1950	F <sub>T</sub> ±30	0.6	1.6	4×4×2 max. Isolation:14dB

## Mixer

Block	Products	Part Number	Center Frequency F <sub>0</sub> (MHz)	Insertion Loss in BW (dB)	VSWR in BW (max.)	Size (mm) / Others
Divider	Hybrid Divider	LDD212G3303A-099	2330.0±30.0	3.4±0.4	1.5	2.0×1.25×1.05 max. Attenuation:11.0dB min. (2×(F <sub>0</sub> ±30.0)MHz), 21.0dB min. (3×(F <sub>0</sub> ±30.0)MHz)
		LDD212G5203A-153	2520.0±30.0	3.4±0.4	1.5	2.0×1.25×1.05 max. Attenuation:11.0dB min. (2×(F <sub>0</sub> ±30.0)MHz), 21.0dB min. (3×(F <sub>0</sub> ±30.0)MHz)

Block	Products	Part Number	Frequency Range (MHz)	Supply Voltage (V)	Size (mm)
Synthesizer	VCO	MQL Series	2300–2360	2.2	5.0×4.0×1.6
	PLL Modules	HFQD08 Series	2300–2360+760	PLL(3.0) VCO(2.7)	12.6×8.6×1.8

## IF

Block	Products	Part Number	Center Frequency F <sub>0</sub> (MHz)	Band Width (kHz)	Insertion Loss (dB max.)	Ripple in BW (dB max.)	GDT Deviation (μsec. max.)	Attenuation (dB min.)	Size (mm) / Others
Tx IF Filters	SAW Filters	SAFC Series	380/570	*	*	*	*	*	3.0×3.0×1.15 max.

\* Please contact nearest sales representatives for details.

# for CDMA-800 ( CDMA ) Tx:887-925MHz, Rx:832-870MHz ( Japan )

## Tx:824-849/1710-1780MHz, Rx:869-894/1800-1870MHz ( Korea )

### RF / LO

Block	Products	Part Number	Center Frequency F <sub>0</sub> (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®	DFYM4851MGBPAG	894 (F <sub>T</sub> -L)	F <sub>T</sub> -L±7	2.6	1.2	1.8	— (F <sub>R</sub> -L±7)	14×11×3 max. ON:F <sub>T</sub> -L/F <sub>R</sub> -L OFF:F <sub>T</sub> -H/F <sub>R</sub> -H ON:2mA max.
			920 (F <sub>T</sub> -H)	F <sub>T</sub> -H±5	2.5	0.8	1.8	— (F <sub>R</sub> -H±5)	
			839 (F <sub>R</sub> -L)	F <sub>R</sub> -L±7	4.3	1.4	1.8	48 (F <sub>T</sub> -L±7)	
			865 (F <sub>R</sub> -H)	F <sub>R</sub> -H±5	3.7	1.2	1.8	48 (F <sub>T</sub> -H±5)	
		DFYK7836MLDJAA	836.5	F <sub>T</sub> ±12.5	3.0	2.0	1.8	38 (F <sub>R</sub> ±12.5)	15.48×9.2×3 max.
			881.5	F <sub>R</sub> ±12.5	3.9	2.1	1.8	51 (F <sub>T</sub> ±12.5)	
Filters(Tx)	Multilayer LC Filters	LFB32906MSA1A539	906.0	F <sub>0</sub> ±19.0	3.5	1.2	2.2	20.0 (F <sub>0</sub> -90.0)	3.2×2.5×1.9 max. Impedance:50Ω(Nominal) Power Capacity:500mW
	SAW Filters	SAFCC906MKA0T00	906	F <sub>0</sub> ±19	4.5	2.8	2.8	30 (832-870)	3.0×3.0×1.15 max. Input Output Impedance: 50Ω
Filters(Rx)	Multilayer LC Filters	LFB32851MSA1A540	851.0	F <sub>0</sub> ±19.0	3.5	1.2	2.2	20.0 (F <sub>0</sub> -90.0)	3.2×2.5×1.9 max. Impedance:50Ω(Nominal) Power Capacity:500mW
	SAW Filters	SAFCC851MKB0T00	851	F <sub>0</sub> ±19	3.5	2.5	2.2	22 (887-925)	3.0×3.0×1.15 max.

Block	Products	Part Number	Center Frequency F <sub>0</sub> (MHz)	Band Width (MHz)	Insertion Loss in BW (dB max.)	VSWR in BW (max.)	Size (mm) / Others
Couplers	Hybrid Couplers	LDC18906M17B-325	906.0	F <sub>0</sub> ±19.0	0.25	1.4	1.6×0.8×0.7 max. Coupling:17.9dB±1.0
Baluns	Hybrid Baluns	LDB21906M20C-001	906.0	F <sub>0</sub> ±19.0	1.3	2.0	2.0×1.25×1.05 max. Unbalance Impedance:50Ω(Nominal) Balance Impedance:200Ω(Nominal)
Isolators	Isolators	CE053906MDCB000T1	906	F <sub>0</sub> ±19	0.7	1.6	5×5×2 max. Isolation:11dB
		CE053836MDCB000TT1	836.5	F <sub>0</sub> ±12.5	0.65	1.5	5×5×2 max. Isolation:13dB

### Mixer

Block	Products	Part Number	Center Frequency F <sub>0</sub> (MHz)	Insertion Loss in BW (dB)	VSWR in BW (max.)	Amplitude Balance (dB max.)	Size (mm) / Others
Divider	Hybrid Divider	LDD21740M03A-077	740.0±19.0	3.4±0.4	1.5	—	2.0×1.25×1.05 max. Attenuation:12.0dB min. (2×(F <sub>0</sub> ±19.0)MHz), 22.0dB min. (3×(F <sub>0</sub> ±19.0)MHz)
	BPF with Integrated Divider	LFD32740MDB1A552	740.0±20.0	6.5	2.2	—	3.2×2.5×1.9 max. Attenuation:20.0dB min. (832-870MHz), 14.0dB min. (608-650MHz) 20.0dB min. (2×(F <sub>0</sub> ±20)MHz) 10.0dB min. (3×(F <sub>0</sub> ±20)MHz)

Block	Products	Part Number	Frequency Range (MHz)	Supply Voltage (V)	Size (mm)
Synthesizer	VCO	MQL Series	720-760 / 954-980 *	3.0	5.0×4.0×1.6
	PLL Modules	HFQC Series	720-760 / 954-980 *	3.0	9.8×8.0×1.8

\* Korea

### IF

Block	Products	Part Number	Center Frequency F <sub>0</sub> (MHz)	Insertion Loss at F <sub>0</sub> (dB max.)	Ripple in BW (dB max.)	GDT Deviation (μ sec. max.)	Attenuation (dB min.)	Size (mm) / Others
1st IF Filters	Multilayer LC Filters	LFB32166MSQ1A532	166.85±0.65	4.5 (in BW)	1.0	—	30.0 (111.2-112.5MHz) 20.0 (2×(F <sub>0</sub> ±0.65MHz) 28.0 (3×(F <sub>0</sub> ±0.65MHz)	3.2×2.5×1.6 max. Balance Impedance (IN): 1000Ω (Nominal) Nominal Impedance (OUT): 50Ω (Nominal)



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

## RF / LO

Block	Products	Part Number	Center Frequency F <sub>0</sub> (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®	DFYH3820MGBJAA	950.0	F <sub>T</sub> ±10.0	0.5	0.3	1.7	20 (F <sub>R</sub> ±10.0)	8×13.5×2.5 max.
			820.0	F <sub>R</sub> ±10.0	1.8	0.5	1.8	27(F <sub>T</sub> ±10.0)	
Filters(Tx)	Multilayer LC Filters	LFL18924MTC1A052	924.5	F <sub>0</sub> ±33.5	0.45	—	1.7	20.0 (2×(F <sub>0</sub> ±33.5)) 15.0 (3×(F <sub>0</sub> ±33.5))	1.6×0.8×0.70 max. Impedance:50Ω(Nominal) Power Capacity:3W
	SAW Filters	SAWCD895MAA0T00	895.5	F <sub>0</sub> ±2.5	4.0	2.1	2.5	9 (870–885)	3.0×3.0×1.15 max.
			942.5	F <sub>0</sub> ±17.5	3.5	2.3	3.2	25 (810–843)	
Filters(Rx)	GIGAFIL®	DFCB2820MLDJAB	820.0	20.0	2.0	0.7	2.0	20 (940–960)	5.8×8.2×3 max.
	Multilayer LC Filters	LFB31847MSL1-979	847.5	F <sub>0</sub> ±37.5	1.4	0.7	2.0	25.0 (550–583) 25.0 (610–625)	3.2×1.6×1.2 max. Impedance:50Ω(Nominal) Power Capacity:500mW
	SAW Filters	SAWCD826MAA0T00	826.5	F <sub>0</sub> ±16.5	2.7	1.6	2.6	46 (549–583)	3.0×3.0×1.15 max.
			877.5	F <sub>0</sub> ±2.5	2.7	1.3	2.6	50 (609–625)	
LO Filters	Multilayer LC Filters	LFB32717MSA1-938	717.5	F <sub>0</sub> ±37.5	3.5	2.0	3.3	15.0 (810–830) 20.0 (2×(F <sub>0</sub> ±37.5))	3.2×2.5×1.9 max. Impedance:50Ω(Nominal) Power Capacity:500mW

Block	Products	Part Number	Center Frequency F <sub>0</sub> (MHz)	Band Width (MHz)	Insertion Loss in BW (dB max.)	VSWR in BW (max.)	Size (mm) / Others
Couplers	Hybrid Couplers	LDC18924M19B-320	924.5	F <sub>0</sub> ±35.5	0.2	1.2	1.6×0.8×0.7 max. Coupling:19.8dB±1.0
	Couplers With LPF	LDC21926M19H-094	926.5	F <sub>0</sub> ±33.5	0.45	1.3	2.0×1.25×1.05 max. Coupling:19.3dB±1.3 Attenuation:23.0dB min. (2×(F <sub>0</sub> ±33.5)MHz), 15.0dB min. (3×(F <sub>0</sub> ±33.5)MHz)
Baluns	Hybrid Baluns	LDB21924M05C-001	924.5	F <sub>0</sub> ±35.5	1.3	2.0	2.0×1.25×1.05 max. Unbalance Impedance:50Ω(Nominal) Balance Impedance:50Ω(Nominal)
Isolators	Isolators/ Circulators	CE053950MCCB000TT1	950.0	F <sub>0</sub> ±10	0.65	1.6	5×5×2 max. Isolation:12dB

## Mixer

Block	Products	Part Number	Center Frequency F <sub>0</sub> (MHz)	Insertion Loss in BW (dB)	VSWR in BW (max.)	Amplitude Balance (dB max.)	Size (mm) / Others
Divider	3dB Hybrid	LDC32900M03B-703	800–1000	3.3±0.5	1.5	1.0	3.2×2.5×1.0 max. Phase Deviation:90°±3.0
	Hybrid Divider	LDD21718M03A-060	718.0±38.0	3.4±0.4	1.5	—	2.0×1.25×1.05 max. Attenuation:12.0dB min. (2×(F <sub>0</sub> ±38.0)MHz), 22.0dB min. (3×(F <sub>0</sub> ±38.0)MHz)

Block	Products	Part Number	Frequency Range (MHz)	Supply Voltage (V)	Size (mm)
Synthesizer	VCO	MQL Series	680–755	2.3	5.0×4.0×1.6

## IF

Block	Products	Part Number	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	SAFCQ130MJC0X00	130.000 (F <sub>0</sub> ) (MHz)	±12 (from F <sub>0</sub> )	6.0 (at Minimum Loss Point)	0.5 (F <sub>0</sub> ±10.5kHz)	6.0 (F <sub>0</sub> ±10.5kHz)	25 (F <sub>0</sub> ±100kHz) 72 (F <sub>0</sub> –885kHz to –925kHz)	6.0×3.5×1.65 max. Input Output Impedance: 740Ω/–1.0pF
2nd IF Filters	CERAFIL®	CFXCB450KCA001-R1	450 (F <sub>n</sub> ) (kHz)	F <sub>n</sub> ±9.0–12.0kHz (3dB BW)	6.0 (at F <sub>n</sub> )	0.5 (within F <sub>n</sub> ) (±10.5kHz)	27.0 (within F <sub>n</sub> ) (±10.5kHz)	47 (within F <sub>n</sub> ) (±100kHz)	6.0×5.2×1.9 Input Output Impedance: 2.0kΩ

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

## RF / LO

Block	Products	Part Number	Center Frequency F <sub>0</sub> (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
Filters(Tx)	Multilayer LC Filters	LFB321G44SA1A538	1441.0	F <sub>0</sub> ±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
		LFL181G44TCA065	1441.0	F <sub>0</sub> ±12.0	0.4	—	1.8	20.0 (2×(F <sub>0</sub> ±12.0)) 20.0 (3×(F <sub>0</sub> ±12.0))	1.6×0.8×0.7 max. Impedance:50Ω(Nominal) Power Capacity:3W
	SAW Filters	SAFSF1G44AA0T00	1441	F <sub>0</sub> ±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 <sup>®</sup>	DFCB21G48LBJAA	1489.0	24	1.4	0.5	2.0	10 (1607–1631)	3.8×5.2×2.0max.
	Multilayer LC Filters	LFB311G48SG1-985	1489.0	F <sub>0</sub> ±12.0	1.3	0.3	2.0	25.0 ((F <sub>0</sub> +256.9)±12)	3.2×1.6×1.3max. Impedance:50Ω(Nominal) Power Capacity:500mW
	SAW Filters	SAFSF1G48AB0T00	1489	F <sub>0</sub> ±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	LFB321G61SA1A555	1619.0	F <sub>0</sub> ±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	Part Number	Center Frequency F <sub>0</sub> (MHz)	Band Width (MHz)	Insertion Loss in BW (dB max.)	VSWR in BW (max.)	Size (mm) / Others
Couplers	Hybrid Couplers	LDC181G4414B-325	1441.0	F <sub>0</sub> ±12.0	0.42	1.4	1.6×0.8×0.7 max. Coupling:14.1dB ± 1.0
Baluns	Hybrid Baluns	LDB211G6020C-001	1600.0	F <sub>0</sub> ±100	0.8	2.0	2.0×1.25×1.05 max. Unbalance Impedance:50Ω(Nominal) Balance Impedance:200Ω(Nominal)
Isolators	Isolators/ Circulators	CE0521G44CCB000TT1	1441.0	24	0.6	1.5	5×5×2 max. Isolation:14dB

## Mixer

Block	Products	Part Number	Center Frequency F <sub>0</sub> (MHz)	Insertion Loss in BW (dB)	VSWR in BW (max.)	Amplitude Balance (dB max.)	Size (mm) / Others
Divider	Hybrid Divider	LDD211G6103A-095	1619.0±12.0	3.4±0.4	1.5	—	2.0×1.25×1.05 max. Attenuation:12.0dB min. (2×(F <sub>0</sub> ±12.0)MHz), 22.0dB min. (3×(F <sub>0</sub> ±12.0)MHz)

Block	Products	Part Number	Frequency Range (MHz)	Supply Voltage (V)	Size (mm)
Synthesizer	VCO	MQL Series	1607.0–1631.0	2.5	5.0×4.0×1.6
	PLL Modules	HFQD80 Series	1607.0–1631.0+129/178	PLL (2.9) VCO (2.2)	9.8×8.0×1.8

## IF

Block	Products	Part Number	Center Frequency F <sub>0</sub>	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	SAFCQ130MJC0X00	130.000 (MHz)	±12 (from F <sub>0</sub> )	6.0 (at Minimum Loss Point)	0.5 (F <sub>0</sub> ±10.5kHz)	6.0 (F <sub>0</sub> ±10.5kHz)	25 (F <sub>0</sub> ±100kHz) 40 (F <sub>0</sub> ±200kHz) 72 (F <sub>0</sub> –885kHz to –925kHz)	6.0×3.5×1.65 max. Input Output Impedance: 740Ω/–1.0pF
	Multilayer LC Filters	LFL43178MAK1-494	178.0 (MHz)	F <sub>0</sub> ±0.5MHz	1.5 (at F <sub>0</sub> )	—	—	30.0 (2×F <sub>0</sub> MHz) 25.0 (3×F <sub>0</sub> MHz)	4.5×3.2×2.3 max. Impedance:50Ω(Nominal) Power Capacity:1W
2nd IF Filters	CERAFIL <sup>®</sup>	CFXCB450KCF A001-R1	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 DECT (TDMA) Tx:1880–1900MHz

## RF / LO

Block	Products	Part Number	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
Top Filters	GIGAFIL®	DFCB21G89LDHAA	1890.0	$F_0 \pm 10$	0.9	0.5	2.0	27 (1655–1679)	5.7×7.4×3 max.
		DFCB21G89LDJAA	1890.0	20	2.0	0.5	2.0	45 (1660–1680)	4.8×3.9×3 max.
		DFCB21G89LBJAB	1890.0	20	1.7	0.5	2.0	35 (1660–1680)	4.4×4.3×2 max.
	Multilayer LC Filters	LFB311G89SP2A542	1890.0	$F_0 \pm 10$	0.85	0.5	2.0	27.0 ( $F_0 - (463.1 \pm 10)$ ) 20.0 (900) 20.0 (100)	3.2×1.6×1.4 max. Impedance:50Ω(Nominal) Power Capacity:500mW
		LFL211G89TC1A015	1890.0	$F_0 \pm 10.0$	0.47	—	1.5	30.0 ( $2 \times (F_0 \pm 10)$ ), 25.0 ( $3 \times (F_0 \pm 10)$ )	2.0×1.25×1.05 max. Impedance:50Ω(Nominal) Power Capacity:3W
Interstage Filters	GIGAFIL®	DFCB21G89LDJAA	1890.0	$F_0 \pm 10.0$	2.0	0.5	2.0	45 (1660–1680)	4.8×3.9×3 max.
		DFCB21G89LBJAA	1890.0	20	2.0	0.5	2.0	40.0 (1660–1680)	4.4×4.3×2 max.

Block	Products	Part Number	Center Frequency $F_0$ (MHz)	Band Width (MHz)	Insertion Loss in BW (dB max.)	VSWR in BW (max.)	Size (mm) / Others
Couplers	Hybrid Couplers	LDC211G8914B-027	1890.0	$F_0 \pm 10.0$	0.32	1.4	2.0×1.25×1.05 max. Coupling:14.4dB±1.0
Baluns	Hybrid Baluns	LDB211G9020C-001	1900.0	$F_0 \pm 100$	0.8	2.0	2.0×1.25×1.05 max. Unbalance Impedance:50Ω(Nominal) Balance Impedance:50Ω(Nominal)
Isolators	Isolators/ Circulators	CE0731G89CCB000T1	1890.0	20	0.6	1.5	7×7×2.5 max. Isolation:15dB
		CE07A1G89CCB000TT1	1890.0	20	0.9	1.5	7×7×3 max. Isolation:15dB

## Mixer

Block	Products	Part Number	Center Frequency $F_0$ (MHz)	Insertion Loss in BW (dB)	VSWR in BW (max.)	Amplitude Balance (dB max.)	Size (mm) / Others
Divider	Hybrid Divider	LDD211G7503A-067	1750.0±30.0	3.4±0.4	1.5	—	2.0×1.25×1.05max. Attenuation:12.0dB min. ( $2 \times (F_0 \pm 30.0)$ MHz), 22.0dB min. ( $3 \times (F_0 \pm 30.0)$ MHz)

## IF

Block	Products	Part Number	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	SAFUW110MCA0T00	110.592	±576	4.5	0.7 ( $F_0 \pm 576$ kHz)	10 ( $F_0 \pm 1.150$ MHz) 30 ( $F_0 \pm 1.728$ MHz)	11.4×5.0×2.0 max. Input Output Impedance: 300Ω//1.2μH

# for 2.4GHz W-LAN (SS) 2400–2483.5MHz\*

\* except France, Spain

## RF / LO

Block	Products	Part Number	Center Frequency F <sub>0</sub> (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
<b>Antenna Switches</b>	RF Diode Switches	<b>LMSW43CA-209</b>	2450.0	F <sub>0</sub> ±50.0	Tx: 0.85	—	2.0	—	4.9×3.2×2.0 max. Power Capacity:27dBm
					Rx: 1.2	—			
<b>Top Filters</b>	GIGAFIL <sup>®</sup>	<b>DFCB22G45LBJAA</b>	2450.0	F <sub>0</sub> ±50	2.0	1.0	2.0	40 (F <sub>0</sub> –500)	4.5×4×2 max.
	Multilayer LC Filters	<b>LFB322G45SN1A504</b>	2450.0	F <sub>0</sub> ±50.0	1.8	0.5	2.0	48.0 (902–928) 50.0 (1500–1550)	3.2×2.5×1.5 max. Impedance:50Ω (Nominal) Power Capacity:500mW
		<b>LFB312G45SP2A502</b>	2450.0	F <sub>0</sub> ±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
		<b>LFL212G45TC1A007</b>	2450.0	F <sub>0</sub> ±50.0	0.6	—	1.5	30.0 (2×(F <sub>0</sub> ±50)) 25.0 (3×(F <sub>0</sub> ±50))	2.0×1.25×1.05 max. Impedance:50Ω (Nominal) Power Capacity:3W
<b>Interstage Filters</b>	Multilayer LC Filters	<b>LFB322G45SN1-947</b>	2450.0	F <sub>0</sub> ±50.0	2.5	1.5	2.2	40.0 (1950) 16.0 (2200) 24.0 (2×F <sub>0</sub> )	3.2×2.5×1.6 max. Impedance:50Ω (Nominal) Power Capacity:500mW
		<b>LFB312G45SG2A509</b>	2450.0	F <sub>0</sub> ±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 <sup>®</sup>	<b>DFCB32G45LBJAA</b>	2450.0	F <sub>0</sub> ±50	3.2	1.5	2.0	45 (F <sub>0</sub> –500)	5.6×3.8×2 max.
<b>Couplers</b>	Hybrid Couplers	<b>LDC182G4517B-327</b>	2450.0	F <sub>0</sub> ±50.0	0.31	1.4		1.6×0.8×0.7 max. Coupling:17.65dB±1.0	
<b>Baluns</b>	Hybrid Baluns	<b>LDB212G4010C-001</b>	2400.0	F <sub>0</sub> ±100.0	0.9	2.1		2.0×1.25×1.05 max. Unbalance Impedance:50Ω(Nominal) Balance Impedance:100Ω(Nominal)	

## Mixer

Block	Products	Part Number	Frequency Range (MHz)	Supply Voltage (V)	Size (mm)
<b>Synthesizer</b>	VCO	<b>MQL Series</b>	2400–2500	3.0	5.0×4.0×1.6
	PLL Modules	<b>HFQS80 Series</b>	2400–2500	3.0	9.8×8.0×1.8

# for 5GHz W-LAN CSMA (OFDM) 5150–5350MHz

## RF / LO

Block	Products	Part Number	Center Frequency F <sub>0</sub> (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
<b>Antenna Switches</b>	RF Diode Switches	<b>LMSW43C</b>	*	*	*	*	*	*	*
<b>Top Filters</b>	GIGAFIL <sup>®</sup>	<b>DFCB25G25LBHAA</b>	5250.0	F <sub>0</sub> ±100	2.0	1.0	2.0	15 (F <sub>0</sub> –375)	4.2×3.4×2 max.
	Multilayer LC Filters	<b>LFB31/SN Series</b>	*	*	*	*	*	*	*
<b>Interstage Filters</b>	Multilayer LC Filters	<b>LFB31/SN Series</b>	*	*	*	*	*	*	*
	GIGAFIL <sup>®</sup>	<b>DFCB35G25LBHAB</b>	5250.0	F <sub>0</sub> ±100	3.0	1.6	2.0	30 (F <sub>0</sub> –375)	6.2×3.4×2 max.
<b>LO Filters</b>	Multilayer LC Filters	<b>LFB31/SN Series</b>	*	*	*	*	*	*	*

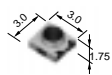
## Mixer

Block	Products	Part Number	Frequency Range (MHz)	Supply Voltage (V)	Size (mm)
<b>Synthesizer</b>	PLL Modules	<b>HFQS14 Series</b>	4650–4750	3.0	11.4×10.0×2.2 max.

\* Please contact nearest sales representatives for details.

# Murata Products for Mobile Communications

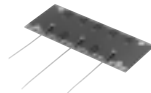
## Microwave Coaxial Connectors



SWD Type



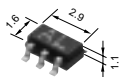
FSC Type



GSC Type in mm

Type	Rated Voltage (V)	Rated Frequency (GHz)	Impedance (Ω)	VSWR max. (f:GHz)
<b>GSC</b>	250	DC-6	50	1.3
<b>SWD</b>	250	DC-6	50	1.3
<b>FSC</b>	250	DC-3	50	1.3

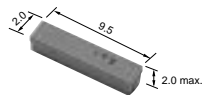
## GaAs MMIC



XM2400LB-PM0601 in mm

Part Number	Application	Characteristics
<b>XM2400LB-PM0601</b>	LNA for 2.4GHz frequency band	F=1.9dB, G=15.5dB VSWR (in/out)=1.8

## Antennas

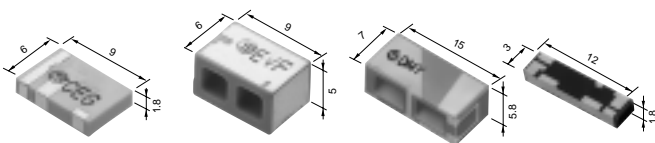


LDA92xxx20 Type in mm

### ● Chip Multilayer Antennas

Part Number	Frequency Range
<b>LDA92xxx20 Type</b>	1.0GHz-2.5GHz

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



ANCL ANCG1 ANCG2 ANCK in mm

### ● Chip Dielectric Antennas

Part Number	Center Frequency (MHz)	Band Width (MHz)	VSWR (max.)
<b>ANCL11G90SAA039TT1</b>	1906.5	25.0	2
<b>ANCL11G89SAA038TT1</b>	1890.0	20.0	
<b>ANCG11G48SAA012TT1</b>	1489.0	24.0	3
<b>ANCK1915MSAA037TT1</b>	915	26.0	
<b>ANCG22G45SAA001TT1</b>	2450	100	2

## Dielectric Resonators (RESOMICS®)



DRD Type



DRT Type

### ● TE Mode

Material	ε <sub>r</sub>	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

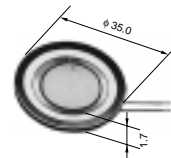


DRR silver plated type

### ● TEM Mode

Electrode	Material	ε <sub>r</sub>	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®)



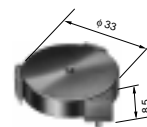
in mm

Part Number	Frequency Range	Capacitance	Input Voltage
<b>USB35EW-0701B</b>	600Hz-20kHz	340nF±35% at 120Hz	4Vrms max. (W/N JIS Filters)

## Piezoelectric Diaphragms

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

## Piezoelectric Ringers (PIEZORINGER®)



in mm

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

## Monolithic Ceramic Capacitors



### ● GRP03 Series Temperature Compensation size 0.6×0.3mm

TC	5C
Rated Voltage (V)	DC25
Capacitance (pF)	1—100

### ● GRP03 Series High Dielectric Constant size 0.6×0.3mm

TC	R7	R6
Rated Voltage (V)	DC16	DC6.3
Capacitance (pF)	100—1000	1500—10000

### ● GRP15 Series Temperature Compensation size 1.0×0.5mm

TC	5C	6C	1X
Rated Voltage (V)	DC50	DC25	DC50
Capacitance (pF)	0.5—150	180—270	47—180

### ● GRP15 Series High Dielectric Constant size 1.0×0.5mm

TC	R7			
Rated Voltage (V)	DC50	DC25	DC16	DC10
Capacitance (pF)	220—4700	6800—10000	15000, 22000	33000—47000

TC	R6			
Rated Voltage (V)	DC10			
Capacitance (pF)	68000—100000			

TC	F5		
Rated Voltage (V)	DC50	DC25	DC16
Capacitance (pF)	2200—10000	22000	100000

### ● High-Cap. Series Capacitance (μF)

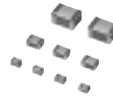
Part Number	TC Rated Voltage (V) Size (mm)	R7			R6		
		DC50	DC25	DC16	DC16	DC10	DC6.3
GRM18	1.6×0.8	—	—	—	—	—	1.0
GRM21	2.0×1.25	—	—	1.0	—	—	2.2 3.3 4.7
GRM31	3.2×1.6	—	1.0	—	2.2	4.7	10
GRM32	3.2×2.5	1.0	—	2.2-4.7	—	10	—

Part Number	TC Rated Voltage (V) Size (mm)	F5			
		DC50	DC25	DC16	DC10
GRM18	1.6×0.8	—	—	—	1.0
GRM21	2.0×1.25	—	1.0-2.2	1.0-2.2	4.7
GRM31	3.2×1.6	—	1.0	4.7	10
GRM32	3.2×2.5	1.0	—	—	—

### ● Low Dissipation GJ615 size 1.0×0.5mm

TC	5C
Rated Voltage (V)	DC50
Capacitance (pF)	0.5—20

## High Frequency Monolithic Ceramic Capacitors



### ● High-Frequency Series Capacitance (pF)

Part Number	TC Rated Voltage (V) Size (mm)	5C		
		200	100	50
ERA11	1.25×1.00	0.5—13	9—22	16—51
ERA21	2.00×1.25	0.5—51	39—91	75—160
ERA32	3.2×2.50	0.5—160	180—510	560—1000

### ● High Power / High Frequency Series Capacitance (pF)

Part Number	TC Rated Voltage (V) Size (mm)	5C				
		500	300	200	100	50
ERE1D	1.4×1.4	—	—	—	—	0.5—100
ERE22	2.8×2.8	0.5—100	110—200	220—470	510—680	750—1000

### ● High Frequency / HiQ Type GQM Series Capacitance (pF)

Part Number	TC Rated Voltage (V) Size (mm)	5C	
		100	50
GQM18	1.6×0.8	0.5—6.8	7.5—24
GQM21	2.0×1.25	0.5—18	22—47

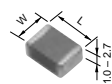
## High Frequency Microchip Capacitors

### ● CLB Series

TC	5C	6U	7K
Capacitance (pF)	0.1—16	0.3—56	0.8—110

TC	B5	F9	W1
Capacitance (pF)	2.0—1200	27—3000	36—4300

## Chip Monolithic Ceramic Capacitor (Medium-Voltage)

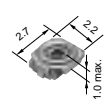


in mm

### ● GRM 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

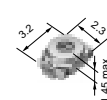
## Chip Trimmer Capacitors



TZS2 Series



TZY2 Series



TZV2 Series

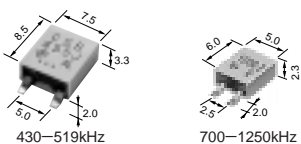


TZB4 Series

in mm

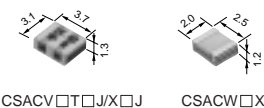
Series	Maximum Capacitance (pF)			
	Temp. Coeff. (ppm/°C)			
	NP0 (0)	N750 (−750)	N1000 (−1000)	N1200 (−1200)
TZS2	6, 10	20	—	—
TZY2	2.5, 3, 6, 10	20, 25	45	—
TZV2	2.5, 3, 6, 10	20	—	—
TZC3	3, 6	10	—	20, 30
TZB4	3, 6, 10, 25	20, 50	—	30, 40

## Ceramic Resonators (CERALOCK®)



### ● CSBFB Series (430–519kHz, 700–1250kHz)

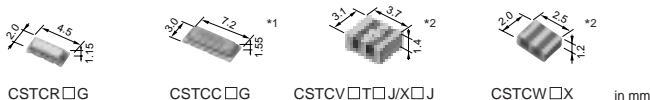
Series	Frequency Range (kHz)	Frequency Accuracy (25°C)	Stability in Temperature (-20°C to +80°C)
CSBFB □ J	430-519, 700-1250	±0.5%	±0.3%



### ● CSACV/CSACW Series (10.01–70.00MHz)

Series	Frequency Range (MHz)	Frequency Accuracy (25°C)	Stability in Temperature (-20°C to +80°C)
CSACV □ T □ J	10.01-13.49	±0.5%	±0.5%
CSACV □ X □ J	13.50-19.99	±0.5%	±0.3%
CSACW □ X	20.00-70.00	±0.5%	±0.2%

● Thickness varies with frequency.



### ● Built-in Capacitor CSTCR/CSTCC/CSTCV/CSTCW Series (2.00–70.00MHz)

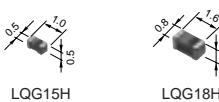
Series	Frequency Range (MHz)	Frequency Accuracy (25°C)	Stability in Temperature (-20°C to +80°C)
CSTCR □ G	4.00-7.99	±0.5%	±0.3%
CSTCC □ G	2.00-3.99, 8.00-10.00	±0.5%	±0.3%*3
CSTCV □ T □ J	10.01-13.49	±0.5%	±0.4%
CSTCV □ X □ J	13.50-19.99	±0.5%	±0.3%
CSTCW □ X	20.00-70.00	±0.5%	±0.2%

\*1 Thickness varies with frequency.

\*2 Thickness varies with frequency and built-in capacitances.

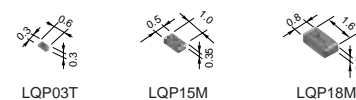
\*3 Stability in temperature varies with built-in capacitances.

## Chip Coils



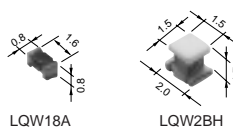
### ● Monolithic Type

Series	Inductance (nH)	Q (min.) at 100MHz	Allowable Current (mA)
LQG15H	1.2-33	8	200
LQG18H	1.2-100	12	300



### ● Film Type

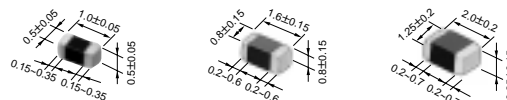
Series	Inductance (nH)	Q (min.) at 500MHz	Allowable Current (mA)
LQP03T	0.6-15	11	90-420
LQP15M	1.0-33	13	60-400
LQP18M	1.3-100	17	50-300



### ● Winding Type

Series	Inductance (nH)	Q (min.)	Allowable Current (mA)
LQW18A	2.2-220	16-40	120-850
LQW2BH	3.3-470	10-40	160-1320

## Chip NTC Thermistors

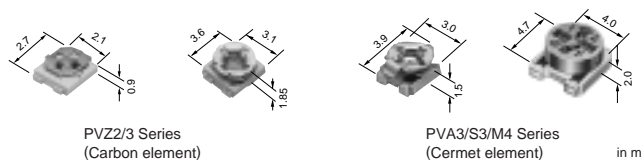


### ● NCP Series

Type	Resistance (25°C)	Rated Electric Power (mW)
NCP15	100Ω-470kΩ	100
NCP18	100Ω-470kΩ	100
NCP21	220Ω-100kΩ	200

● Resistance Tolerance : ±5%, ±10%

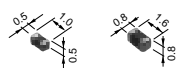
## Trimmer Potentiometers



Series	Power Rating (W)	Resistance Range	TCR (ppm/°C)
PVZ2	0.1 (50°C)	500Ω-1MΩ	±500
PVZ3		200Ω-2MΩ	
PVA3/S3	0.1 (70°C)	100Ω-2MΩ	±250
PVM4 □ □ □ □ A01		200Ω-2MΩ	
PVM4 □ □ □ □ B01	0.25 (70°C)	100Ω-2MΩ	±100 (200Ω-50kΩ) ±150 (100Ω, 100kΩ min.)



## Chip Ferrite Beads (EMIFIL®)



BLM15 BLM18

in mm

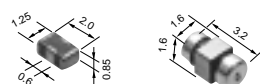
### ● BLM15 Series

Series	Impedance (Typ.) at 100MHz (Ω)	Rated Current (mA)
<b>BLM15A</b>	10-1000	50-500
<b>BLM15B</b>	75-1000	50-100

### ● BLM18 Series

Series	Impedance (Typ.) at 100MHz (Ω)	Rated Current (mA)
<b>BLM18R</b>	120-1000	100-200
<b>BLM18P</b>	30-60	500-1000
<b>BLM18A</b>	120-1000	100-200
<b>BLM18B</b>	5-2500	50-700
<b>BLM18HG</b>	470-1000	100-200
<b>BLM18HD</b>	470-1000	50-100
<b>BLM18HK</b>	330-1000	50-200

## Built-in Capacitor Chip EMIFIL®



NFM21P NFE31P

in mm

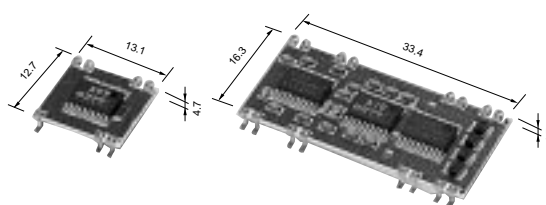
### ● NFM21P Series for Large Current

Series	Capacitance	Rated Voltage (Vdc)	Rated Current (Adc)
<b>NFM21P</b>	0.1-1μF	10-25	2-4

### ● NFE31P Series for Large Current T-type

Series	Capacitance (pF)	Rated Voltage (Vdc)	Rated Current (A)	Temperature Range (°C)
<b>NFE31P</b>	22-2200	25	6	-40 to +85

## High Frequency Active Filter



Part Number	Application	Filter Characteristics	Dimensions (mm)		
			L	H	T
<b>AFM834YL1M90K1</b>	W-CDMA Base Station	Dual 1.9MHz LPF	33.4	16.3	4.7
<b>AFL78YL615KK1</b>	CDMA-800 Base Station	615kHz LPF	13.1	12.7	4.7

## Chip Multilayer Delay Line

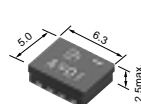


LDH21

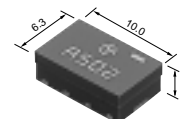
in mm

### ● For Hand Set

Series	Application	Delay Time
<b>LDH21</b>	Phase Adjustment	30-1200ps



LDH65



LDHA2

in mm

### ● For Base Station

Series	Application	Delay Time
<b>LDH65</b>	Base Station	0.1-1.0ns
<b>LDHA2</b>	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 PHAA4645-1G50E03



### For Use

The measurement of antenna propagation characteristics of mobile communication equipment.

### 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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⟨For customers outside Japan⟩

Murata products should not be used or sold for use in the development, production, stockpiling or utilization of any conventional weapons or mass-destructive weapons (nuclear weapons, chemical or biological weapons, or missiles), or any other weapons.

⟨For customers in Japan⟩

For products which are controlled items subject to the "Foreign Exchange and Foreign Trade Law" of Japan, the export license specified by the law is required for export.

**2. Please contact our sales representatives or product engineers before using our products listed in this catalog for the applications listed below which require especially high reliability for the prevention of defects which might directly cause damage to the third party's life, body or property, or when intending to use one of our products for other applications than specified in this catalog.**

- 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

**3. Product specifications in this catalog are as of November 2000. They are subject to change or our products in it may be discontinued without advance notice. Please check with our sales representatives or product engineers before your ordering. If there are any questions, please contact our sales representatives or product engineers.****4. The parts numbers and specifications listed in this catalog are for information only. You are requested to approve our product specification or to transact the approval sheet for product specification, before your ordering.****5. Please note that unless otherwise specified, we shall assume no responsibility whatsoever for any conflict or dispute that may occur in connection with the effect of our and/or third party's intellectual property rights and other related rights in consideration of your using our products and/or information described or contained in our catalogs. In this connection, no representation shall be made to the effect that any third parties are authorized to use the rights mentioned above under licenses without our consent.****6. None of ozone depleting substances (ODS) under the Montreal Protocol is used in manufacturing process of us.**

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