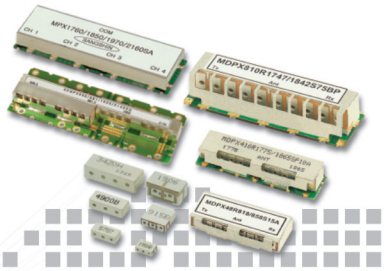
ISO 9001:2008 | ISO 14001:2004 | ISO/TS 16949:2009 | SQ Certification | SES-Tier2 Certification

SANGSHIN
ELECOM

DIELECTRIC RESONATOR FILTERS
MONO-BLOCK FILTERS
LC FILTERS
CAVITY FILTERS
ANTENNAS & ANTENNA MODULES
DIELECTRIC RESONATORS
VOLTAGE CONTROLLED OSCILLATOR(VCO)
SYNTHESIZER/PHASE LOCKED LOOP(PLL)



SANGSHIN ELECOM CO., LTD.

SANGSHIN

Company Vision

To be recognized for excellence in innovation & Technology

Company Profile

Brief History

1973 Korea Sangshin Electric Co., Ltd. established.
1974 Mica Capacitor production facility established.
1982 LC filter & Delay Line developed.
1982 Award received from the Ministry of Trade & Industry.
1987 Hybrid IC production line built.
1990 R&D Center & Ceramic Production facility established.
1991 Dielectric resonator filter developed.
1992 Voltage Controlled Oscillator for wireless communication developed.
1996 ISO-9002 certification received.
1996 Award received from the Ministry of Science & Technology.
1996 Certification for 100ppm (Quality Drive) received.
1999 Y2K certification received.
2000 Synthesizers / Phase Locked Loop(PLL) developed.
2000 GPS patch antenna developed.
2000 Chip Antenna for Bluetooth developed.
2001 Shanghai factory established.
2001 GPS module developed.
2002 Humidity Sensor developed.
2003 Company name change to Sangshin Elecom.
2003 QS9000 certified.
2005 ISO9001 certified.
2005 ISO14001 certified.
2006 ISO/TS 16949 certified.
2007 SQ certification awarded by HKMC.
2009 Metal antenna/PCB antenna developed.
2010 C/R(Fuel Level Card) developed for HKMC.
2012 Bluetooth module developed.
2014 GNSS module developed.

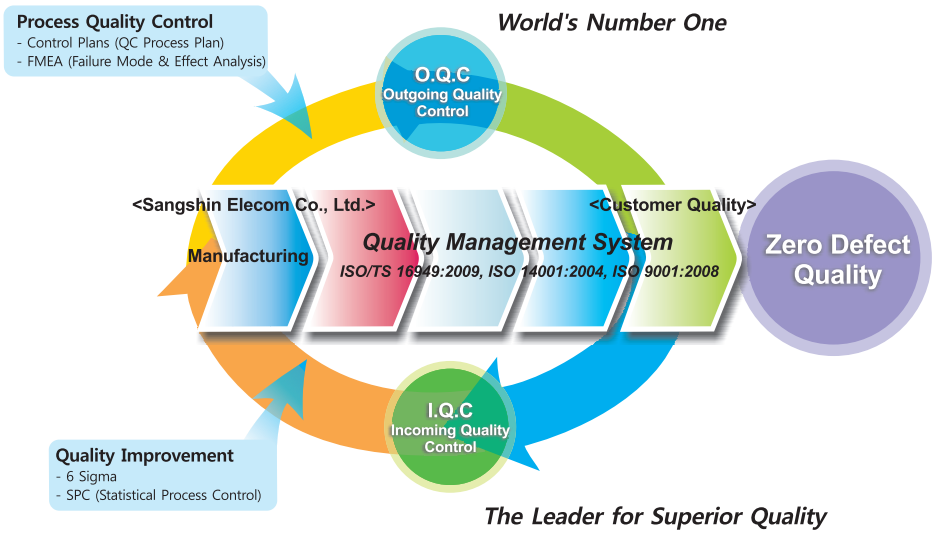
Contents

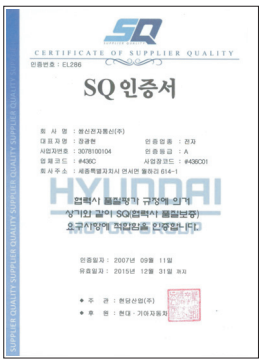
Sangshin Elecom Co., Ltd., as a leading manufacturer in the RF & Microwave industry, realizes the customer satisfaction by continuous new product developments based on accumulated techniques, experience, and creative concept.

The quality management is certainly established to grow into a top global company, and for this, all executives and staffers take active part in its successful implementation.

In order to ensure the quality and price competitiveness, we continue to expand our production facilities and establish the business superiority system.

Quality Management / Quality System





Core Value / Environmental Policy

Sangshin Elecom is the first manufacturer of dielectric filters in Korea. We go upon the global market and professes the
strong intent of challenge, enterprising attitude and the passion that can make the impossibility possible in ubiquitous surroundings.

As an innovative leader creating growth power, we go over the present IT techniques and create tomorrow's technology.
We are doing the best to provide the value and listen closely to the customers.

We have been actively practicing the environmental policy since 2003 and do comply with the related regulations as well as customer requirements and continuously expand green workshops which eventually contributes to customers.

Filter

Features

- High Q Factor
- Available in 2-14 Poles
- Available with 2mm - 12mm Resonator Sizes
- Wide Frequency Range (10KHz-8GHz)
- Low Insertion Loss
- Custom Designs Available
- Operating Temperature Range (-45°C to + 85°C)
- Notch Filters Available
- Tape and Reel Available

Applications

- Cellular phone
- Cordless phone
- PCS
- TRS
- GPS
- GSM
- Wireless LAN
- DMB/DAB
- WCDMA
- WIBRO/WIMAX
- RFID
- CATV
- LTE

Dielectric Resonator Filter

Description

Sangshin's dielectric resonator filters are designed with multiple High Q quarter wavelength resonators maximizing the characteristic of material. It provides optimal performance while maintaining the cost and size advantages.

Part Numbering

Band Pass Filter Series	Duplexer Series	BEF Series
BP ■■R ■■■■ S ■■ A	DPX ■■R ■■■■ / ■■■■ S ■■ A	BEF ■■R ■■■■ S ■■ A

Mono Block Filter

Description

The Monoblock package uses one blocked body which enables cost effectiveness as well as keeping the benefits of Dielectric Resonator filters.

Part Numbering

Band Pass Filter Series	Duplexer Series	BEF Series
MBP ■■R ■■■■ S ■■ A	MDPX ■■R ■■■■ / ■■■■ S ■■ A	MBEF ■■R ■■■■ S ■■ A

LC Filters

Description

Sangshin's LC filters are designed with lumped elements optimized to provide high performance and cost effective solutions in the 100KHz to 400MHz range.
It offers low insertion loss as well as high frequency selectivity across the available frequency ranges.

Part Numbering

Band Pass Filter Series	Duplexer Series	BEF Series
BPF ■■■ MS ■■ A	DPX ■■■ / ■■■ MS ■■ A	BEF ■■■MS ■■ A

Cavity Filters

Description

Sangshin's Cavity filters consist of High Q resonators surrounded by silver plated aluminum and brass–copper filter housing. The resonator layout is optimized to provide the lowest insertion loss and the highest level of selectivity that can be realized. It is the prime choice for an overall superior performance and power handling.

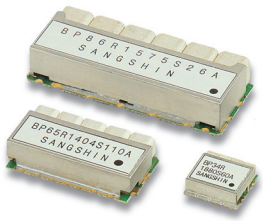
Part Numbering

Band Pass Filter Series	Duplexer Series	BEF Series
CABPF ■MR ■■■■ S ■■ A	CADPX ■MR ■■■■ / ■■■■ S ■■ A	BEF ■■R ■■■■ S ■■ A

Dielectric Resonator Filters

Band Pass Filters

Configuration



Filter specifications can be customized to customer requirements.

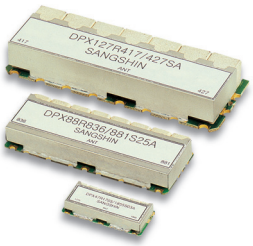
Specification Examples

Part No.	Fc [MHz]	BW [MHz]	I.L [dB]	VSWR	Attenuation [dB]	Dim. [W x L x H]
BP32R1575S02A	1575.42	2	1.2 max.	2.0 max.	14 min. @ Fc ±140 MHz	7x13.5x4.5
BP33R881S30A	881.5	25	2.5 max.	1.6 max.	53 min. @ 779 MHz	10x15x4.5
BP34R2442S84A	2442	84	2.5 max.	1.7 max.	40 min. @ Fc ±400 MHz	13x12x4.5
BP37R500S100B	500	100	3.0 max.	1.5 max.	20 min. @ 428 MHz	22x20x4.8
BP43R3200S30A	3200	30	4.0 max.	1.5 max	30 min. @ Fc ±150 MHz	13x12x5.5
BP45R2140S20B	2140	20	4.5 max.	1.5 max.	50 min. @ Fc ±70 MHz	23x16x5.5
BP46R900S200B	900	200	3.0 max.	1.7 max.	50 min. @ 1200~1400 MHz	27x16x5.5
BP47R1975S250C	1975	250	3.0 max.	1.5 max.	53 min. @ 2260~2510 MHz	31x13x5.5
BP55R1855S30B	1855	30	3.0 max.	1.5 max.	60 min. @ 1695 MHz	26x16x6.5
BP62R392S05A	392.5	5	2.0 max.	1.7 max.	13 min. @ Fc ±25 MHz	15x29x7.5
BP63R3530S60B	3530	60	2.5 max.	1.5 max.	37 min. @ 2910~3235 MHz	20x13x7.5
BP64R836S30A	836.5	30	3.0 max.	1.7 max.	19 min. @ Fc ±32.5 MHz	26x14x7.5
BP65R1404S110A	1404	110	2.5 max.	1.5 max.	40 min. @ Fc ±200 MHz	32x17x7.5
BP66R1960S60A	1960	60	3.5 max.	2.0 max.	30 min. @ 1850~1910MHz	38.5x19x7.5
BP68R813S15A	813.5	15	8.0 max.	3.0 max.	5 min. @ Fc ±7.5 MHz	50x20x8
BP84R836S25A	836.5	25	3.0 max.	1.8 max.	35 min. @ 869~894 MHz	34x25x10
BP86R1227S26A	1227	26	3.0 max.	1.5 max.	60 min. @ Fc ±80 MHz	50x20x10

Fc: Center Frequency, I.L: Insertion Loss

Duplexers

Configuration



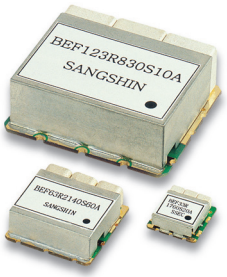
Specification Examples

Part No.	Fc [MHz]		BW [MHz]	I.L [dB]	VSWR	Isolation [dB]	Dim. [W x L x H]
DPX127R417/427SA	CH1	416.75	3.5	2.8 max.	1.5 max.	40 min. @ CH2	88x33x15
	CH2	426.75	3.5	2.8 max.	1.5 max.	40 min. @ CH1	
DPX88R836/881S25A	CH1	836.5	25	2.0 max.	1.4 max.	55 min. @ CH2	65x28x9.5
	CH2	881.5	25	2.0 max.	1.4 max.	55 min. @ CH1	
DPX88R902/947S25A	CH1	902.5	25	2.0 max.	1.4 max.	55 min. @ CH2	65x28x9.5
	CH2	947.5	25	2.0 max.	1.4 max.	55 min. @ CH1	
DPX44R1227/1575S10B	CH1	1227	10	3.5 max.	2.0 max.	30 min. @ 1378 MHz	19x15x5.5
	CH2	1575	10	3.5 max.	2.0 max.	30 min. @ 1475 MHz	
DPX37R1480/1950S60E	CH1	1480	60	2.5 max.	1.5 max.	35 min. @ CH2	23x14x4.3
	CH2	1950	60	1.8 max.	1.5 max.	50 min. @ CH1	
DPX36R1765/1855SB	CH1	1765	30	2.0 max.	1.7 max.	50 min. @ CH2	20x11x4.5
	CH2	1855	30	3.0 max.	2.0 max.	42 min. @ CH1	
DPX36R1950/2140S60A	CH1	1950	60	2.5 max.	1.8 max.	40 min. @ CH2	20x14x4.5
	CH2	2140	60	2.5 max.	1.8 max.	48 min. @ CH1	

Fc : Center Frequency, I.L: Insertion Loss

Band Elimination Filters

Configuration



Specification Examples

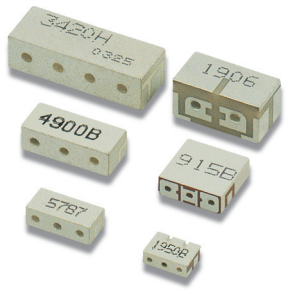
Part No.	BW1 [MHz]	BW2 [MHz]	I.L BW1 [dB]	I.L BW2 [dB]	Attenuation [dB]	Dim. [W x L x H]
BEF123R830S10A	825~835		1.4 max.		20 min. @ 818.5 MHz	39x23.5x14.5
BEF33R1850S20A	1840~1860		1.0 max.		20 min. @ 1750 ~ 1770 MHz	11x11.5x4.5
BEF52R873S06B	5~750	750~852	0.5 max.	1.5 max.	26 min @ 870 ~ 876 MHz	12x16x6.5
BEF63R1950S60A	880~960	1805~1880	1.0 max.	1.0 max.	15 min. @1920 ~ 1980 MHz	20x20x7.5
BEF63R2140S60A	2060	2220	3.0 max.	3.0 max.	20 min. @ 2110 ~ 2170 MHz	20x20x7.5
MBEF43R1575S02A	960	1710	1.0 max.	1.0 max.	25 min. @ 1575.42 MHz	11.3x7.1x3.65
MBEF43R2332S25A	700~2170	2496~2690	1.0 max.	1.0 max.	33 min. @ 2320 ~ 2345 MHz	11.3x4.55x3.65

Fc: Center Frequency, I.L: Insertion Loss

Mono Block Filters

Band Pass Filters

Configuration



Filter specifications can be customized to customer requirements.

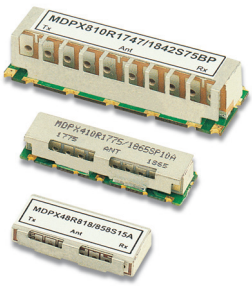
Specification Examples

Part No.	Fc [MHz]	BW [MHz]	I.L [dB]	VSWR	Attenuation [dB]	Dim. [W x L x H]
MBP22R1575S03A	1575	3	3.2 max.	2.0 max.	15 min. @ Fc ± 50 MHz	3.8X5.2X2
MBP32R902S25B	902.5	25	2.6 max.	2.0 max.	6.5 min. @ Fc ± 32.5 MHz	5.6X8.5X2.9
MBP33R1880S60B	1880	60	2.4 max.	2.0 max.	10 min. @ Fc ± 100 MHz	4.6X4X2.9
MBP33R1960S60B	1960	60	2.4 max.	2.0 max.	10 min. @ Fc ± 100 MHz	7.6X3.8X2.9
MBP33R5250S200B	5250	200	2.5 max.	2.0 max.	40 min. @ 5650 MHz	8.2X4.2X3.0
MBP33R5825S200B	5825	200	2.5 max.	2.0 max.	40 min. @ 5425 MHz	8.2X3.85X3.0
MBP44R1850S20A	1850	20	3.0 max.	2.0 max.	50 min. @ Fc + 80 MHz	14.8X8.3X3.8
MBP44R1N1747S75A	1747	75	3.5 max.	1.7 max.	20 min. @ Fc –57.5 MHz	13X6.5X3.9
MBP44R1N1842S75A	1842	75	3.5 max.	1.7 max.	25 min. @ Fc –57.5 MHz	13X6.3X3.9
MBP56RC2N1880SP60A	1880	60	4.0 max.	1.5 max.	15 min. @ 1920 MHz	30X12X7.2
MBP56RC2N1960SP60A	1960	60	4.0 max.	1.5 max.	15 min. @ 1920 MHz	30X12X7.2
MBP810RC836SP25A	836.5	25	3.5 max.	1.5 max.	38 min. @ 859 MHz	42X17X9.5
MBP810RC881SP25A	881.5	25	3.5 max.	1.5 max.	38 min. @ 859 MHz	42X17X9.5
MBP810RC1880SP60A	1880	60	3.5 max.	1.5 max.	18 min. @ 1920 MHz	42X12X8.8
MBP810RC1960SP60A	1960	60	3.5 max.	1.5 max.	18 min. @ 1920 MHz	42X12X8.8

Fc : Center Frequency, I.L: Insertion Loss

Duplexers

Configuration



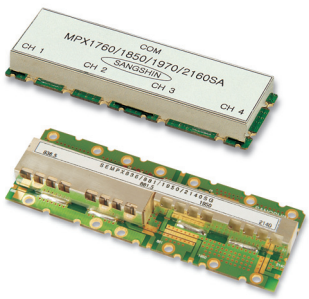
Specification Examples

Part No.		Fc [MHz]	BW [MHz]	I.L [dB]	VSWR	Isolation [dB]	Dim. [W x L x H]
MDPX37R 1950/2140S60A	CH1	1950	60	2.5 max.	2.0 max.	40 min. @ CH2	13.8x6.5x2.8
	CH2	2140	60	3.0 max.	2.0 max.	50 min. @ CH1	
MDPX48R 836/881S25A	CH1	836	25	2.5 max.	2.0 max.	40 min. @ CH2	22x9.6x3.85
	CH2	881	25	3.5 max.	2.0 max.	50 min. @ CH1	
MDPX48R 1950/2140SP20C	CH1	1950	20	2.0 max.	1.5 max.	50 min. @ CH2	22.3x8.1x5.2
	CH2	2140	20	2.0 max.	1.5 max.	50 min. @ CH1	
MDPX410R 1760/1850SP20E	CH1	1760	20	2.5 max	1.5 max.	55 min. @ CH2	30x8.8x5
	CH2	1850	20	2.5 max.	1.5 max.	55 min. @ CH1	
MDPX58R 1542/1643S34A	CH1	1542	34	1.8 max.	1.5 max.	45 min. @ CH2	27.2x8.6x5.8
	CH2	1643	34	1.8 max.	1.5 max.	45 min. @ CH1	
MDPX58R 3592/3692S42C	CH1	3592.5	42	2.7 max.	2.0 max.	40 min. @ CH2	27.5x8.5x5.9
	CH2	3692.5	42	2.7 max.	2.0 max.	40 min. @ CH1	
MDPX810R 836/881S25I	CH1	836.5	25	2.2 max.	1.5 max.	58 min. @ CH2	42x17x9.5
	CH2	881.5	25	2.2 max.	1.5 max.	58 min. @ CH1	
MDPX810R 1747/1842S75D	CH1	1747.5	75	2.4 max.	1.5 max.	30 min. @ CH2	42x9.3x8.4
	CH2	1842.5	75	2.4 max.	1.5 max.	30 min. @ CH1	
MDPX810R 1880/1960SP60O	CH1	1880	60	2.8 max.	1.5 max.	40 min. @ CH2	44x14x8.8
	CH2	1960	60	2.8 max.	1.5 max.	40 min. @ CH1	

Fc : Center Frequency, I.L: Insertion Loss

Multiplexers

Configuration



Specification Examples

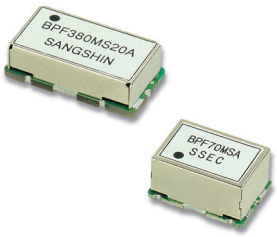
Part No.		Fc [MHz]	BW [MHz]	I.L [dB]	VSWR	Isolation [dB]	Dim. [W x L x H]
SEMPX836/881/1950/2140SA	CH1	836.5	25	2.5 max.	1.4 max.	50 min	133x56x11
	CH2	881.5	25	2.5 max.	1.4 max.		
	CH3	1950	20	2.5 max.	1.4 max.		
	CH4	2140	20	2.5 max.	1.4 max.		
SEMPX-CDMA/USPCS-SA	CH1	836.5	25	3.0 max.	1.5 max.	50 min	88x25x10.5
	CH2	881.5	25	3.0 max.	1.5 max.		
	CH3	1880	60	4.0 max.	1.5 max.		
	CH4	1960	60	4.0 max.	1.5 max.		

Fc : Center Frequency, I.L: Insertion Loss

LC Filters

Band Pass Filters

Configuration



Filter specifications can be customized to customer requirements.

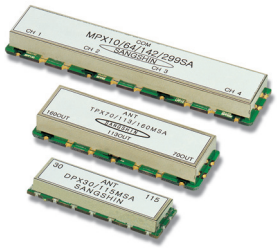
Specification Examples

Part No.	Fc [MHz]	BW [MHz]	I.L [dB]	VSWR	Attenuation [dB]	Dim. [W x L x H]
BPF10MS01A	10	2	3.0 max.	1.5 max.	25 min. @ Fc + 20 MHz	23x12x7
BPF70MSA	70	5	4.5 max.	1.5 max.	35 min. @ Fc ± 20 MHz	16x11x8
BPF100MS10A	100	10	3.5 max.	1.5 max.	25 min. @ Fc ± 20 MHz	23x12x7
BPF200MS10A	200	10	3.5 max.	1.5 max.	45 min. @ Fc ± 80 MHz	23x12x7
BPF300MS10A	300	10	5.0 max.	1.5 max.	40 min. @ Fc ± 50 MHz	23x12x7
BPF470MS10A	470	10	5.0 max.	1.5 max.	20 min. @ Fc ± 100 MHz	23x12x7
BPF950MSA	950	100	3.0 max.	1.8 max.	25 min. @ Fc ± 200 MHz	23x12x7
BPF1800MS800A	1800	800	3.0 max.	1.5 max.	-	23x12x7

Fc : Center Frequency or Cutoff Frequency, I.L: Insertion Loss

Duplexers

Configuration



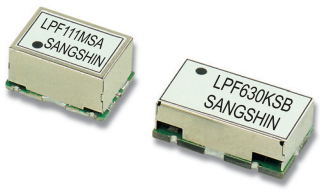
Specification Examples

Part No.	Fc [MHz]		BW [MHz]	I.L [dB]	VSWR	Isolation [dB]	Dim. [W x L x H]
DPX85/105MHL	CH1	85	30	1.6 max.	1.5 max.	60 min. @ CH2	47x15x6.5
	CH2	105	105~175	1.7 max.	1.5 max.	60 min. @ CH1	
DPX1000/1700SA	CH1	547	200~894	1.0 max.	1.5 max.	40 min. @ CH2	23x12x8
	CH2	2045	1920~2170	1.0 max.	1.5 max.	40 min. @ CH1	
TPX70/113/160SA	CH1	70	30	1.0 max.	1.5 max.	40 min.	55x18x8
	CH2	113	CW	4.5 max.	1.5 max.		
	CH3	160	30	2.5 max.	1.5 max.		
MPX10/64/142/299SA	CH1	64.5	20	2.0 max.	1.5 max.	55 min.	85x18x8
	CH2	142.5	20	2.5 max.	1.5 max.		
	CH3	-	DC~10	1.2 max.	1.8 max.		
	CH4	299	62	3.0 max.	1.5 max.		

Fc : Center Frequency or Cutoff Frequency, I.L: Insertion Loss

Low Pass Filters

Configuration



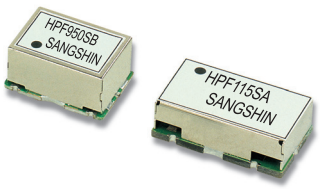
Specification Examples

Part No.	Fc [MHz]	BW [MHz]	I.L [dB]	VSWR	Attenuation [dB]	Dim. [W x L x H]
LPF630KSB	630KHz	DC ~ 630KHz	1.0 max.	1.5 max.	40 min. @ 1.75 MHz	21x12x7
LPF5MHz	5	DC ~ 5	1.0 max.	1.5 max.	43 min. @ 7 MHz	21x12x7
LPF70SA	70	DC ~ 70	1.0 max.	1.5 max.	20 min. @ 85 MHz	16x11x5.2
LPF1500MHz	1500	DC ~ 1500	3.0 max.	1.5 max.	25 min. @ 2500 MHz	16x11x5.2
LPF2700MHz	2700	2500 ~ 2700	1.8 max.	1.5 max.	35 min. @ 5000 MHz	10.8x6.5x6.5

Fc : Center Frequency or Cutoff Frequency, I.L: Insertion Loss

High Pass Filters

Configuration



Specification Examples

Part No.	Fc [MHz]	BW [MHz]	I.L [dB]	VSWR	Attenuation [dB]	Dim. [W x L x H]
HPF110S20A	110	110 ~ 130	1.5 max.	1.5 max.	65 min. @ 80 MHz	16x11x5.2
HPF115SA	115	115 ~ 200	2.0 max.	2.0 max.	5 min. @ 110 MHz	23x12x8
HPF950SB	950	950 ~ 2150	1.5 max.	2.0 max.	15 min. @ DC ~ 870 MHz	16x11x5.2
HPF1300MHz	1300	1300 ~ 3000	3.0 max.	1.5 max.	40 min. @ 600 MHz	16x11x5.2

Fc : Center Frequency or Cutoff Frequency, I.L: Insertion Loss

Cavity Filters

Band Pass Filters

Filter specifications can be customized to customer requirements.

Configuration

Specification Examples

Part No.	Fc [MHz]	BW [MHz]	I.L [dB]	VSWR	Attenuation [dB]	Dim. [W x L x H]
CABPF10MR881.5S25A	881.5	25	3.0 max.	1.5 max.	50 min. @ Fc +14.5 MHz	184.5x95x60
CABPF10MR836.5S25B	836.5	25	3.0 max.	1.5 max.	40 min. @ Fc +14.5 MHz	172x75x60
CABPF6MR1950S60A	1950	60	1.0 max.	1.3 max.	20 min. @ Fc ±50 MHz	25x210x30
CABPF5MR2140S60B	2140	60	0.5 max.	1.3 max.	88 min. @ Fc -355 MHz	95x163x42
CABPF7MR4700S600B	4700	600	2.0 max.	1.5 max.	70 min. @ Fc -2200 MHz	103x50x22.5

Fc : Center Frequency, I.L: Insertion Loss

Duplexers

Configuration

Specification Examples

Part No.	Fc [MHz]		BW [MHz]	I.L [dB]	VSWR	Isolation [dB]	Dim. [W x L x H]
CADPX16MR 836/881S25D	CH1	836.5	25	3.5 max.	1.5 max.	35 min. @ Fc+15.5 MHz	119x121x6
	CH2	881.5	25	3.5 max.	1.5 max.	35 min. @ Fc ±15.5 MHz	
CADPX8MR 1765/1855BN30A	CH1	1765	30	1.0 max.	1.25 max.	65 min. @ CH2	57x43x46
	CH2	1855	30	1.0 max.	1.25 max.	65 min. @ CH1	
CADPX8MR 1950/2140S20C	CH1	1950	20	1.2 max.	1.25 max.	90 min. @ CH2	90x50x22
	CH2	2140	20	1.2 max.	1.25 max.	90 min. @ CH1	
CADPX18MR 3452.25/3552.25	CH1	3452.25	85	2.0 max.	1.5 max.	75 min. @ CH2	171x126x3
	CH2	3552.25	85	2.0 max.	1.5 max.	75 min. @ CH1	
CADPX14MR 5750/5825S50B	CH1	5750	50	2.5 max.	1.25 max.	65 min. @ CH2	192x57x16
	CH2	5825	50	2.5 max.	1.25 max.	65 min. @ CH1	

Fc : Center Frequency, I.L: Insertion Loss

Band Elimination Filters

Configuration

Specification Examples

Part No.	Reject Fc [MHz]	Reject BW [MHz]	BW [MHz]	I.L [dB]	VSWR	Rejection [dB]	Dim. [W x L x H]
CABEF5MR830N10A	830	10	100~815 855~1616	2.0 max.	1.5 max.	40 min. @ Fc +5 MHz	283x53x86
CABEF5MR870N10A	875	10	100~860 901~1616	2.0 max.	1.5 max.	40 min. @ Fc +5 MHz	283x53x86

Fc : Center Frequency I.L: Insertion Loss

Delay Filters

Configuration

Specification Examples

Part No.	Fc [MHz]	BW [MHz]	I.L [dB]	VSWR	DELAY TIME [nS]	Dim. [W x L x H]
CADL8MR1855S50B	1855	50	0.4 max.	1.25 max.	12 ± 0.4	182x28x33
CADL6MR1850S30A	1855	30	0.4 max.	1.25 max.	6 ± 0.4	72x49x24
CADL6MR2140S100A	2140	100	0.4 max.	1.25 max.	8 ± 0.4	70x52x26

Fc : Center Frequency, I.L: Insertion Loss

Multiplexers

Configuration

Specification Examples

Part No.	Fc [MHz]		BW [MHz]	I.L [dB]	VSWR	Attenuation [dB]	Dim. [W x L x H]
CATPX22MR 905/1795/2045NA	CH1	905	110	1.0 max.	1.5 max.	50 min. @ CH2&CH3	140x82x76
	CH2	1795	170	1.5 max.	1.5 max.	50 min. @ CH1&CH3	
	CH3	2045	250	1.5 max.	1.5 max.	60 min. @ CH1&CH2	
CADIPX32MR 1760/1850/1970/2160NA	CH1	1760	18.75	1.2 max.	1.28 max.	70 min. @ CH2	162x55x22
	CH2	1850	18.75	1.2 max.	1.28 max.	70 min. @ CH1&CH3	
	CH3	1970	18.44	1.2 max.	1.28 max.	70 min. @ CH2&CH4	
	CH4	2160	18.44	1.2 max.	1.28 max.	70 min. @ CH3	

Fc : Center Frequency, I.L: Insertion Loss

Antennas & Antenna Modules

Passive Patch Antennas

Description

Sangshin's KSA series provide excellent performance by using the proprietary material specially developed for the high performance antenna elements. These elements are highly suited for RFID, GPS, SDARS and W-LAN applications.
Custom designs are also available.

Features

- Small form factor
- Operating Temperature Range(-40°C to +85°C)
- Low Return Loss
- Uniform Dielectric Constant
- Offset single-point feeding method

Element Construction

- Type : Flat patch antenna
- Design : Rectangular micro-strip antenna

Part Numbering

KSA - ■■ - ■■■■M S■■X - (Y■■ / B)
① ② ③ ④ ⑤

① Korea Sangshin Antenna
② SP : Special / ST : Standard
③ Center Frequency[MHz]
④ Size : Square□□ mm
⑤ Feeding location:□□ mm / if omitted, 3.0mm

Active Antenna Module (For GPS / SDMB)

Description

Sangshin's SAL series offer advanced Assisted Global Positing System (A-GPS), Global Positing System (GPS) and/or Satellite Digital Multimedia Broadcasting (SDMB) with the high performance in small package. GPS receiver with patch antenna is designed to receive the frequency 1575.42 MHz and SDMB at 2642MHz.

Features

- High performance Low Noise Amplifier(LNA) included
- Low RF system Noise figure
- Low Current
- Operating Temperature Range(-40°C to +85°C)
- Circular and Linear type

Application

- GPS, A-GPS Application
- Automotive Navigation
- Personal Positioning
- Sporting, Recreation, PDA, UMPC and MP4
- Satellite Digital Multimedia Broadcasting

Part Numbering

SAL - ■■ - G(S) ■ - ■ ■■
① ② ③ ④ ⑤ ⑥

① Sangshin Antenna LNA
② XX : Operating Voltage (ex. 2.8: 2.8[V])
③ G : GPS / S : SDMB
④ X : Patch Antenna Size (ex. D: 15 x 15)
⑤ X : Patch Antenna Thickness (ex. 3: 3mm thick)
⑥ X : Version (ex. 01)

Smart Antenna Module (For GNSS)

Description

Sangshin's SSA the 5th generation SIRF star product. It is a hybrid positing system that combines GPS, GLONASS, SBAS and MEMS sensor data to provide a high performance navigation solution. The integrated DSP provides a flexible processing solution for future function, extending the platform lifetime and enabling future regional satellite overlays.

Features

- High performance PVT engine
- GPS, GLONASS, QZSS and SBAS reception
- Concurrent tracking of multiple constellations
- High-sensitivity tracking to – 165 dBm
- Instant fix (Achieving fast TTFF times)

Part Numbering

SSA - ■■ - GN ■ - ■ - ■■ - ■■
① ② ③ ④ ⑤ ⑥ ⑦

① Sangshin Smart Antenna
② XXXX :Voltage (ex. 3.3 (3.3V))
③ GN: GNSS
④ Patch Antenna Size (ex. A: 25 x 25)
⑤ X : Patch Antenna Thickness (ex. 4: 4mm thick)
⑥ X : Version (ex. 01)
⑦ X : connector Type

Antennas & Antenna Modules

Patch Antennas

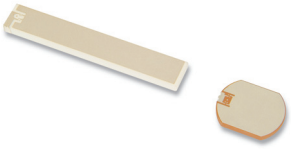
Configuration

Specifications (GPS / DMB / RFID)

Application	Part No. [KSA -]	Dimension	Polarization	Return Loss[dB]	Gain [dBi]	Ground Plane[mm]
GPS	ST1575MS36	36 x 36 x 4.0	Circular (RHCP, LHCP)	-15 min.	+5.5	80 x 80
	ST1575MS25	25 x 25 x 4.0			+4.5	70 x 70
	ST1575MS25B	25 x 25 x 4.0			+4.5	70 x 70
	SP1575MS25-Y22	25 x 25 x 4.0			+4.5	70 x 70
	ST1575MS20	20 x 20 x 4.0			+3.0	60 x 60
	ST1575MS18	18 x 18 x 4.0			+2.5	50 x 50
	ST1575MS15	15 x 15 x 4.0			+1.5	50 x 50
	ST1575MS13	13 x 13 x 3.5			0	50 x 50
	ST1575MS17B	17 x 17 x 4.0			+2.5	70 x 70
	LSP1575MS2515	25 x 15 x 4.0	Linear		+1	66 x 16
	LST1575MS2513	25 x 13 x 4.0			+0.5	66 x 16
	LSP1575MS2511	25 x 11 x 4.0			0	66 x 16
	LSP1575MS3517T3	35 x 17 x 3.0	Circular		+3	70 x 70
SDARS	LCSP2326MS25	25 x 25 x 4.0	LHCP		+4.5	70 x 70
	RCSP2340MS20	20 x 20 x 4.0	RHCP		+3.0	60 x 60
DMB	LCSP2642MS25	25 x 25 x 4.0	LHCP		+4.5	70 x 70
	RCSP2642MS20	20 x 20 x 4.0	RHCP		+3.0	60 x 60
RFID	SP912MS25	25 x 25 x 4.0	Circular (RHCP, LHCP)	10~15dB	+2	Patch GP
	SP912MS35	35 x 35 x 4.0			+3.5	80 x 80
	SP912MS70	70 x 70 x 7.0			+5.5	Patch GP
	SP912MS80	80 x 80 x 7.0			+5.5	Patch GP
	SP912MS100	100 x 100 x 7.0			+5.5	Patch GP

RFID Metal Tag Antennas

Configuration

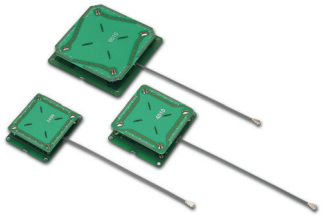


Specifications

Part No.	RID912MS6010T3	RID912MS4020T3	RID912MS21T2	RID912MS25T18C	RID912MS25
Dim.	60 x 10 x 3.0	40 x 20 x 3.0	21pi x 17 x 2.0	27pi x 25 x 1.8	25 x 25 x 4.0

RFID PCB Type Antennas

Configuration

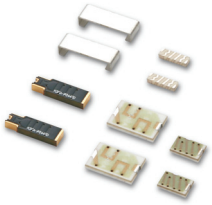


Specifications

Part No. [KSA -]	Dimension	Bandwidth [MHz min.]	Gain [dBi]	Polarization
921A6010B100B	60 x 60 x 10	60	2.0	RHCP
921A4010B100B	40 x 40 x 10	30	0.0	
921A6010B100B	34 x 34 x6.5	20	-4.0	

Chip Antennas

Configuration



Specifications (Bluetooth / WLAN)

Part No. [KSCA -]	Dimension	Bandwidth [MHz min.]	Gain [dBi]	Part No. [KSCA -]	Dimension	Bandwidth [MHz min.]	Gain [dBi]
B2442A	9.8 x 6.7 x 1.0	200	1.0	B2450H62A	6.0 x 2.0 x 1.1	80	1.2
S2442CP	6.0 x 4.0 x 1.0	200	0.2	B2450H93MA	9.0 x 3.0 x 1.2	100	2.1
B2442DP	11.0 x 3.2 x 1.8	50	-2.3	B2450H93A	9.0 x 3.0 x 1.2	80	0.23
B2450MA	11.7 x 4 x 2.5	160	2.9				

Antennas & Antenna Modules

Active Antenna Module(for GPS/SDMB)

Configuration

Specifications

	Part No.	Antenna Size[mm]	Frequency [MHz]	LNA Gain[dB]	Noise Figure [dB]	Polarization	V.S.W.R [Max.]
GPS	SAL-2.8GA301	25x25x3	1575.42±1.023	12 15 18 20 23 25 30	0.8~1.8	RHCP	2.0 : 1
	SAL-2.8GB301	20x20x3					
	SAL-2.8GC301	18x18x3					
	SAL-2.8GD301	15x15x3					
	SAL-2.8GI301	13x13x3					
	SAL-2.8GA401	25x25x4					
	SAL-2.8GB401	20x20x4					
	SAL-2.8GC401	18x18x4					
	SAL-2.8GD401	15x15x4					
	SAL-2.8GI401	13x13x4					
	SAL-2.8GE301	25x15x3				LP	
	SAL-2.8GF301	25x13x3					
	SAL-2.8GJ301	34x17x3					
	SAL-2.8GE401	25x15x4					
	SAL-2.8GF401	25x13x4					
	SAL-2.8GJ401	34x17x4					
SDMB	SAL-2.8SF301	25x13x3	2642		1.0~1.8	RHCP/LHCP	
	SAL-2.8SF401	25x13x3					

External Active Antenna Module

Configuration

Specifications

	Part No.	Antenna Size[mm]	Frequency [MHz]	LNA Gain[dB]	Noise Figure[dB]	Polarization	V.S.W.R [MHz]
GPS	SAL-2.8GA405	25x25x4	1575.42±1.023	22 [Typical]	1.0~1.6	RHCP	2.0:1
GNSS	SAL-3GNA-401	25x25x4	1575~1608				

External Smart Antenna Module (for GNSS)

Configuration

Specifications

Part No.	SSA-3.3GNA401-2.5AJ
Chipset	SIRF Star 5
Voltage [V]	3 ~ 5 [User Specified]
Current [mA]	53
Tracking Sensitivity [dBm]	-165
Frequency [MHz]	1575~1608
Cold / Warm / Hot Start [sec]	35 / 30 / 1
Connector	2.5 Audio jack [User Specified]

Dielectric Resonators

TEM Mode

Features

- Stable dielectric constant
- High Q factor (160~1000)
- Wide frequency range (400~6000MHz)
- Surface mount(no-pin) and surface mount(W/pin) available
- Frequency tolerance to 1.0%
- Temperature stability (0±10 ppm/°C)
- Operating temperature range (-40°C to +85°C)

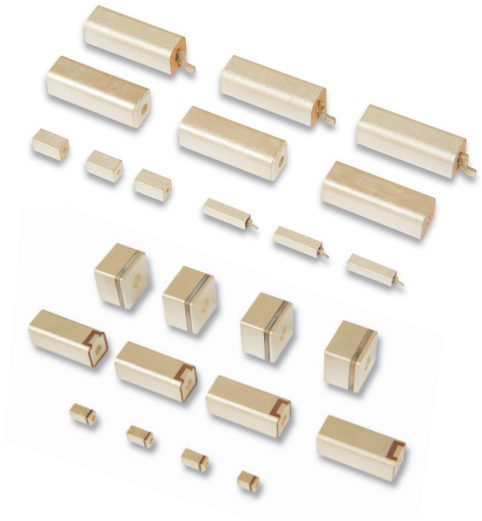
Applications

- Oscillators (DRO/VCO)
- Wireless phone
- Wireless headphone
- Filter and duplexer (CDMA/PCS/WLL/IMT2000)
- Wireless Microphone

Part Numbering

KS37	D60	10	4	1000	-1.0	S
①	②	③	④	⑤	⑥	⑦

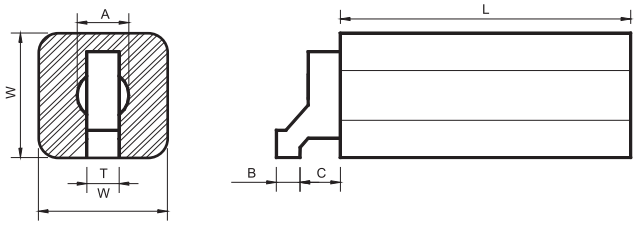
① Material series
② Size
③ Characteristic impedance (Ω)
④ Resonance wave length
⑤ Resonance frequency (MHz)
⑥ Frequency tolerance (%)
⑦ Pole pin – S : with pole pin
N : without pole pin
P : print type
L : Laser type



Specifications

Dielectric Constant	Temperature Coefficient [ppm/°C]	Size	Frequency Range [MHz]	Q [Min.]
21	0 ± 10	2x2	2050~6000	200
		3x3	1300~6000	300
		4x4	1100~5500	400
		6x6	750~3300	550
		8x8	870~3000	700
		10x10	870~3000	800
		12x12	850~2500	850
37	0 ± 10	2x2	1700~6000	200
		3x3	1000~4550	300
		4x4	800~4000	350
		6x6	550~2400	400
		8x8	660~3000	680
		10x10	660~3000	760
		12x12	650~2500	800
45	0 ± 10	2x2	1500-5500	180
		3x3	870-4000	280
		4x4	750-3500	300
		6x6	500-2200	350
		8x8	600-2500	550
		10x10	600-2500	650
		12x12	600-2200	750
55	0 ± 10	2x2	1400-5000	160
		3x3	800-3700	250
		4x4	700-3300	280
		6x6	450-2000	350
		8x8	500-2400	500
		10x10	500-2400	620
		12x12	520-2000	700
90	0 ± 10	2x2	1000~3900	160
		3x3	650~2900	230
		4x4	400~2650	250
		6x6	400~1550	350
		8x8	400~1800	460
		10x10	450~1800	580
		12x12	400~1500	640

Dimensions



Part	W [mm]	A [Φ]	B	C	T
2x2	2.00 ± 0.2	0.65 ± 0.1	0.65 ± 0.1	1.00 ± 0.1	0.40 ± 0.1
		0.80 ± 0.1			
3x3	3.00 ± 0.2	0.95 ± 0.1	0.70 ± 0.1	1.30 ± 0.1	0.40 ± 0.1
4x4	4.00 ± 0.2	1.20 ± 0.1	0.80 ± 0.1	1.30 ± 0.1	0.60 ± 0.1
		1.50 ± 0.1			
		2.00 ± 0.1			
6x6	6.00 ± 0.2	2.00 ± 0.1	1.20 ± 0.1	1.80 ± 0.1	0.80 ± 0.1
		2.20 ± 0.1			
		2.40 ± 0.1			
8x8	8.00 ± 0.2	2.80 ± 0.1	1.50 ± 0.1	1.80 ± 0.1	0.80 ± 0.1
10x10	10.00 ± 0.2	3.50 ± 0.1	1.50 ± 0.1	2.00 ± 0.1	1.00 ± 0.1
12x12	12.00 ± 0.2	3.50 ± 0.1	2.00 ± 0.1	2.50 ± 0.1	1.00 ± 0.1
		4.00 ± 0.1			

VCO/PLL

Features

- Miniature surface mount package
- Low phase noise & wide bandwidth
- +5V operation
- Wide linear tuning range
- Low current consumption

Applications

- RF/IF signal generator
- Sweep synthesizer
- Up down converter
- High speed switching time (PLL, DDS)
- Low phase noise coaxial oscillator
- Wide band signal source

Description

Sangshin's VCO/PLL is an ideal solution for any signal generation. With its excellent electrical and mechanical performance, it can be the best choice for signal source integrations. Miniature SMT package is pick and place friendly. Sangshin's VCO/PLL is manufactured by the ISO 9001 certified facility, incorporating the surface mount assembly and the automated electronic measurement. This ensures the consistent electrical performance and the quality on mass production quantities.

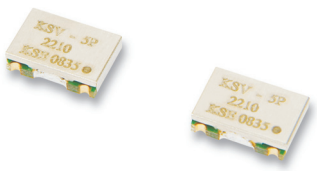
Part Numbering

VCO	KSV - ■P■■■ A SEV - ■V■■■ A
PLL	KSP - ■A■■■ A SEP - ■VA■■■ A

Voltage Controlled Oscillators

P - TYPE (10.4x7.4x 3.0 mm)

Configuration

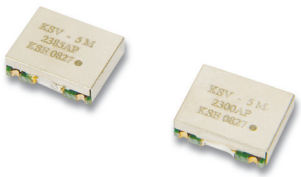


Specifications(Customized Specification is available)

Part No.	Frequency [MHz]	Tuning Voltage [V]	Phase noise@ 10KHz [dBc/Hz]	2nd Harmonics [dBc]	Power [dBm]
KSV-5P230A	220~240	0.5~4.5	-103	-20	0
KSV-5P550	510~590	0.0~5.0	-103	-20	2
KSV-5P950	925~975	0.5~4.5	-103	-20	5
KSV-5P1150A	1050~1250	0.2~4.8	-93	-25	3
KSV-5P1900C	1800~2000	0.2~4.8	-98	-25	0
KSV-5P2070	2010~2130	0.5~4.5	-98	-25	0
KSV-5P2557	2542~2573	0.5~4.5	-97	-25	4

M - TYPE (12.4x10.0x4.0 mm)

Configuration



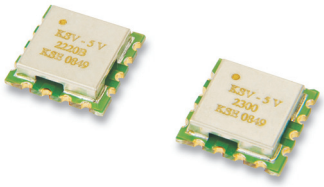
Specifications(Customized Specification is available)

Part No.	Frequency [MHz]	Tuning Voltage[V]	Phase noise@ 10KHz [dBc/Hz]	2nd Harmonics [dBc]	Power [dBm]
KSV-5M260A	250~270	0.5~4.5	-110	-20	3
KSV-5M420	417~423	0.5~4.5	-105	-15	5
KSV-5M870B	860~880	0.5~4.5	-109	-25	4
KSV-5M1030	1010~1050	0.5~4.5	-103	-27	3
KSV-5M1895A	1840~1950	0.5~4.5	-99	-18	2
KSV-5M2385A	2355~2415	0.5~4.5	-100	-19	5

VCO/PLL

V - TYPE (12.7x12.7x3.0 mm)

Configuration

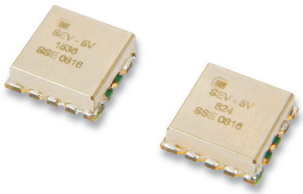


Specifications(Customized Specification is available)

Part No.	Frequency [MHz]	Tuning Voltage [V]	Phase noise @10KHz [dBc/Hz]	2nd Harmonics [dBc]	Power [dBm]
KSV-5V156	140~172	1.5~3.5	-113	-18	0
KSV-5V280A	274~286	0.5~4.5	-110	-13	0
KSV-5V325	300~350	0.5~4.5	-108	-15	5
KSV-5V910A	860~960	1.0~4.0	-100	-30	4
KSV-5V1150	1090~1210	0.5~4.5	-102	-17	7
KSV-5V1650	1500~1800	0.5~4.5	-96	-20	1
KSV-5V2000	1700~2300	0~5	-95	-23	3
KSV-5V2140C	2050~2250	0.5~4.5	-97	-22	0
KSV-5V2400A	2300~2500	1~4	-97	-24	2
KSV-5V2545A	2395~2695	0.5~4.5	-97	-23	5
KSV-5V2740	2720~2760	1~4	-91	-35	1

V - TYPE (12.7x12.7x4.0 mm)

Configuration



Specifications(Customized Specification is available)

Part No.	Frequency [MHz]	Tuning Voltage [V]	Phase noise @10KHz [dBc/Hz]	2nd Harmonics [dBc]	Power [dBm]
SEV-5V370	340~400	0.5~4.5	-106	-12	2
SEV-5V915	902~928	1~4	-110	-13	1
SEV-5V1628	1612~1644	0.5~4.5	-107	-25	3
SEV-5V1960	1910~2010	0.5~4.5	-102	-20	4
SEV-5V2175	2130~2220	0.5~4.5	-101	-20	0
SEV-5V2360	2200~2500	0.2~4.5	-98	-20	4

Phase Locked Loop/Synthesizers

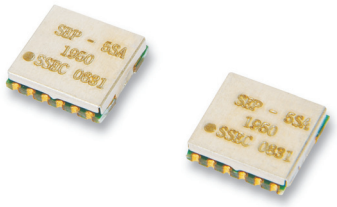
PLL Type Table

TYPE	SIZE	FREQUENCY	PICROM	TCXO
SA -TYPE	9.8x9.3x2.0 mm	Variable	External	External
ST-TYPE	12.7x12.7x3.2 mm	Variable	External	Internal
VA -TYPE		Variable	External	External
VC -TYPE		Fixed	Internal	Internal
VF -TYPE		Fixed	Internal	External
VT -TYPE	19x19x6.5 mm	Variable	External	Internal
A -TYPE		Variable	External	External
C -TYPE		Fixed	Internal	Internal
F -TYPE		Fixed	Internal	External
T -TYPE		Variable	External	Internal

VCO/PLL

ST, SA - TYPE (9.8x9.3x2.0 mm)

Configuration

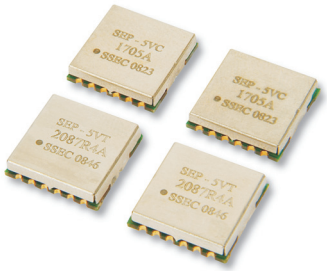


Specifications(Customized Specification is available)

Part No.	Frequency [MHz]	Power [dBm]	PDF [KHz]	P/N @ 10KHz [dBc/Hz]	2nd Harmonics [dBc]	REF FERQ [MHZ]		PLL IC
						In	Ex	
SEP-3.3ST1639R5A	1607~1672	3	100	-94	-30	26		MB15E07SL
SEP-3.3ST1835A	1830~1840	5	100	-98	-25	26		MB15E07SL
SEP-5ST1547R5A	1510~1585	4	50	-99	-30	26		MB15E07SL
SEP-5ST1974R8A	1944.8~2004.8	0	100	-97	-22	26		MB15E07SL
SEP-5ST2065A	2005~2125	7	50	-95	-22	26		MB15E07SL
SEP-5ST2349R5A	2319.5~2379.5	0	100	-96	-17	26		MB15E07SL

VA, VC, VF, VT - TYPE (12.7x12.7x3.2 mm)

Configuration

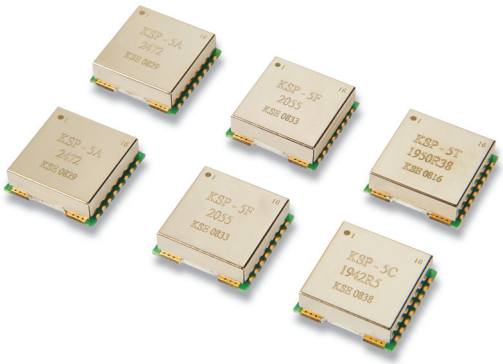


Specifications(Customized Specification is available)

Part No.	Frequency [MHz]	Power [dBm]	PDF [KHz]	P/N @ 10KHz [dBc/Hz]	2nd Harmonics [dBc]	REF FERQ [MHZ]		PLL IC
						In	Ex	
SEP-5VA703R5A	691~716	3	100	-94	-18		10	ADF4153
SEP-5VA725A	695~755	3	10	-95	-25		10	ADF4153
SEP-5VA746R5A	734~759	3	100	-92	-18		10	ADF4153
SEP-5VA1856A	1826~1886	3	100	-90	-30		10	ADF4153
SEP-5VA1966A	1936~1996	3	100	-88	-28		10	ADF4153
SEP-5VA2238R5B	2218.5~2258.5	7	100	-88	-22		10	ADF4153
SEP-5VA751R5C	751.5	5	-	-98	-20		10	ADF4153
SEP-5VA756R5C	756.5	5	-	-98	-20		10	ADF4153
SEP-5VA1690A	1690	5	-	-91	-28		10	ADF4153
SEP-5VA1870A	1870	5	-	-91	-19		10	ADF4153
SEP-5VA2010A	2010	5	-	-90	-18		10	ADF4153
SEP-5VA2102R3A	2102.3	5	-	-89	-26		10	ADF4153

A, F, T, C - TYPE (19x19x6.5 mm)

Configuration

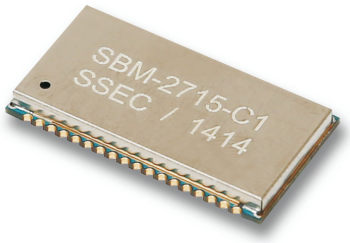


Specifications(Customized Specification is available)

Part No.	Frequency [MHz]	Power [dBm]	PDF [KHz]	P/N @ 10KHz [dBc/Hz]	2nd Harmonics [dBc]	REF FERQ [MHZ]		PLL IC
						In	Ex	
KSP-5A631	625~637	1	125	-99	-25		10	ADF4153
KSP-5A1665A	1635~1695	1	125	-92	-25		10	ADF4153
KSP-5A2182	2132~2232	1	125	-92	-30		10	ADF4153
KSP-5A2313A	2200~2410	3	125	-92	-24		10	ADF4153
KSP-5A2317R9A	2282.9~2352.9	3	100	-91	-22		10	ADF4153
KSP-5A2378	2328~2428	3	125	-91	-30		10	ADF4153
KSP-5A2472	2422~2522	3	125	-90	-25		10	ADF4153
KSP-5A2835R3A	2804.3~2874.3	3	100	-85	-28		10	ADF4153
KSP-5A3220A	3120~3320	3	125	-85	-35		10	ADF4153

Bluetooth Module

Bluetooth Module



Applications

- Industrial and Domestics Applications
- High speed data Transceiver system for long-distance communication

Part Numbering

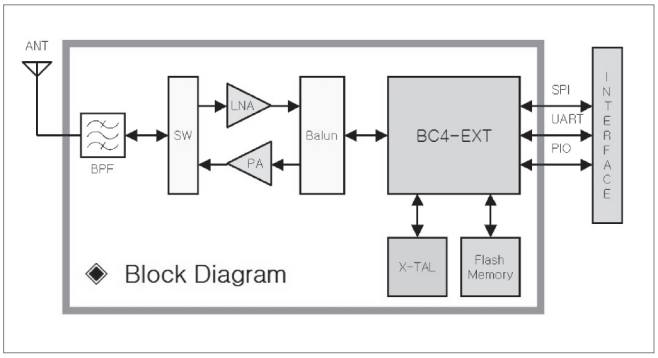
SBM ❶ - 2715 ❷ - C1 ❸

① Sangshin Bluetooth Module
② Module Size
③ Class 1

Features

- Bluetooth Specification V2.0 / Class 1
- QDID : B020665
- Output Transmit power : Typical +13 [dBm]
- Sensitivity : Typical -85 [dBm] (0.1% BER)
- Profile : SPP (Serial Port Profile)
- Size : 27.1 X 14.8 X 2.6mm (with Shield case)
- Operating Temperature : -40°C ~ + 85°C
- UART, PIO Interface
- Surface Mountable
- D.C 3.3V Power Supply

Block Diagram



QDL Bluetooth® Qualified Design Listing

The Bluetooth SIG Hereby Recognizes

Sangshin elecom co.,LTD
Member Company

Bluetooth class 1 Module(SBM-2715-C1)
Qualified Design Name

Qualified Design ID(s): B020665
Specification Name: 2.0
Product Type: Controller Subsystem
Model Number: SBM-2715-C1
BQE Name: Uon-Chae Song
Listing Date: 26 February 2013
Assessment Date: 25 February 2013
Hardware Version Number: SS_PP
Software Version Number: V0.65

This certificate acknowledges the *Bluetooth*® Specifications declared by the member were achieved in accordance with the *Bluetooth* Qualification Process as specified within the *Bluetooth* Specifications and as required within the current PRD

Bluetooth® SPECIAL INTEREST GROUP

GNSS Module

GNSS Module

Applications

- Navigation, Black box
- PDA
- Health and fitness
- Cellular handset
- Tablet computer

Part Numbering

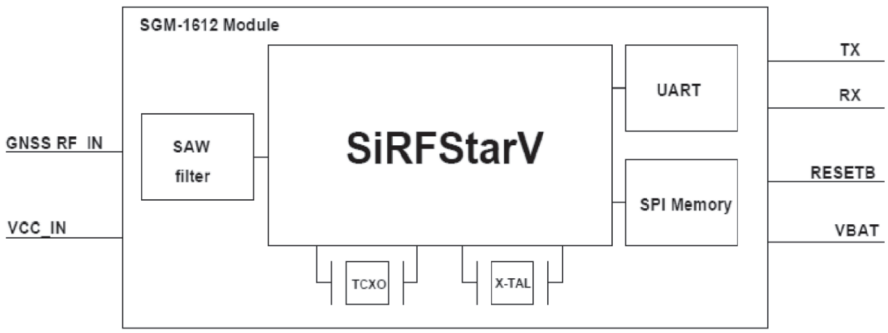
SGM ① - 1612 ② - A ③

① Sangshin GNSS Module
② Module Size
③ A : 115200 bps

Features

- High performance PVT engine.
- GPS, GLONASS, QZSS and SBAS reception.
- High GNSS availability and accuracy.
- High Sensitivity tracking to – 165 dBm.
- Concurrent tracking of multiple constellations.
- Low power data logging.
- Instant Fix (Achieving fast TTFF times).
- A-GNSS ready.
- Green (ROHS Compliant).
- D.C 3.3V Power Supply.
- Size: 16 X 12.2 X 3.0mm (with Shield case).
- Operating Temperature: -30°C ~ + 80°C.

Block Diagram



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