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2009-9

PRODUCT GUIDE

Radio-Frequency Semiconductors



▶ **SEMICONDUCTOR**

<http://www.semicon.toshiba.co.jp/eng>

Radio-Frequency Semiconductor Devices

Thank you for using Toshiba's semiconductor devices. As you know, semiconductor products are widely used in both home and industrial applications. This catalog covers transistors, diodes and cell packs housed in small packages designed for mobile communications equipment. For details, please see the individual technical datasheets.

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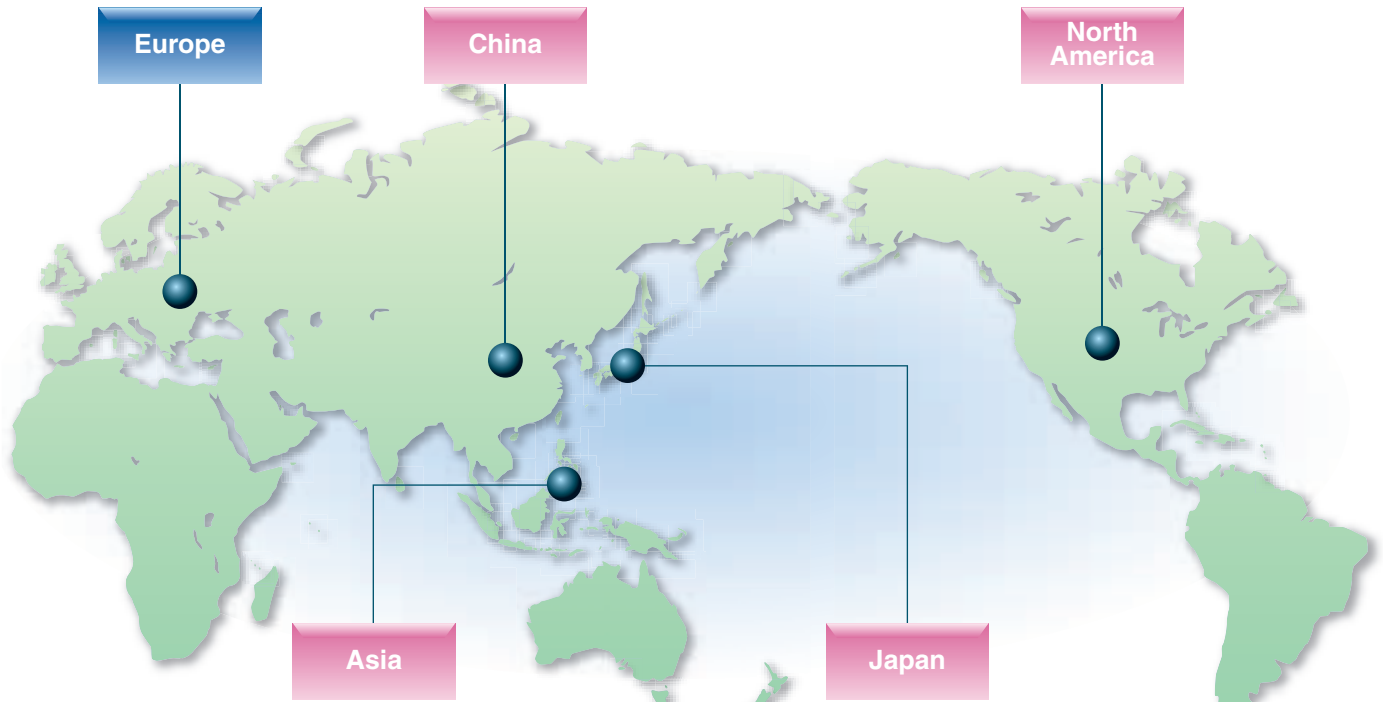
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Mobile Communications Systems of the World

	Analog	Digital
Cell Phones		GSM GPRS DCS1800 W-CDMA
Cordless Phones	CT0 CT1	DECT

	Analog	Digital
Cell Phones		GSM GPRS N-CDMA CDMA2000
Cordless Phones	45/48 MHz 900 MHz	DECT 900 MHz PHS 2.4 GHz

	Analog	Digital
Cell Phones		CDMA PCS CDMA2000
Cordless Phones	46/49 MHz 900 MHz	2.4 GHz 5.8 GHz SST 2.4 GHz PACS 5.8 GHz



Europe

China

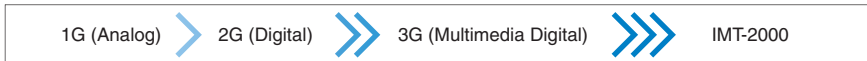
North America

Asia

Japan

	Analog	Digital
Cell Phones		GSM CDMA2000
Cordless Phones	CT0	CT2 DECT PHS

	Analog	Digital
Cell Phones		CDMA2000 W-CDMA
Cordless Phones	Low Power Cordless	PHS



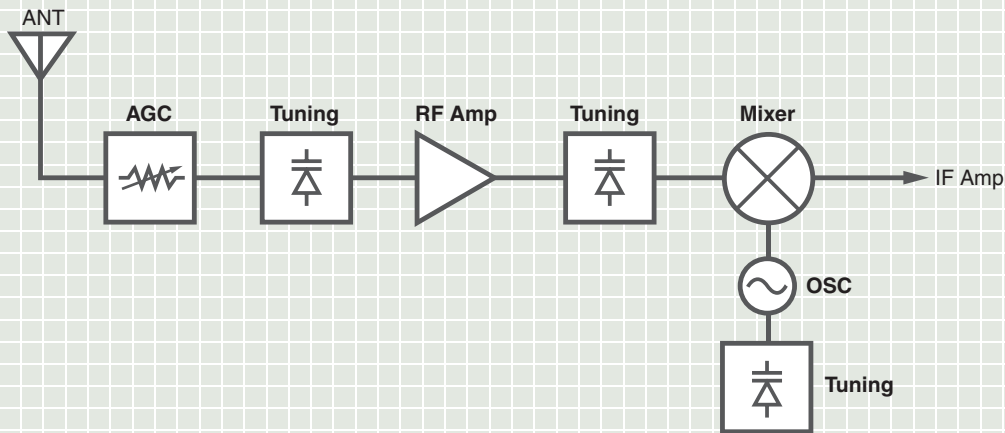
Cell Phone Technologies

Cordless Phone Technologies

	GSM	TDMA (IS-136)	CDMA (IS-95)	MC-CDMA (US solution)	W-CDMA (Japan/Europesolution)	PHS	DECT
Frequency	TX: 880-915 RX: 925-960	TX: 824-849 RX: 869-894	TX: 824-849 RX: 869-894 J-CDMA TX: 887-925 RX: 832-870	2 GHz band	2 GHz band TX: 1920-1980 RX: 2110-2170	1895-1918	1880-1900
Multiple Access Method	TDMA	TDMA	CDMA	CDMA	CDMA	TDMA	TDMA
Duplex Method	FDD	FDD	FDD	FDD	FDD	TDD	TDD
Modulation	GMSK	$\pi/4$ DQPSK	TX: QPSK RX: OQPSK	TX: HPSK RX: QPSK	TX: HPSK RX: QPSK	$\pi/4$ DQPSK	GMSK
Speech Coding	RPE-LTP	VSELP	Variable rate QCELP			ADPCM	ADPCM
Channel Spacing	200 kHz (Interleave)	30 kHz (Interleave)	1.25 MHz	5 MHz (1.25 MHzx3)	5 MHz	300 kHz	1728 kHz
Output Power	Up to 2 W (Class 4)	Up to 600 mW (Class 3/4)	200 mW to 1 W (Portable Type)		Up to 250 mW (Portable Type)	10 mW (Average) 100 mW (Peak)	10 mW (Average) 250 mW (Peak)
Data Rate			14.4/64 kbps	384 kbps	384 kbps	32/64/128 kbps	
Channels Per Carrier	8	3				4	12

1. Recommended Products by Application

1-1 Radio-Frequency Devices for AM Tuners



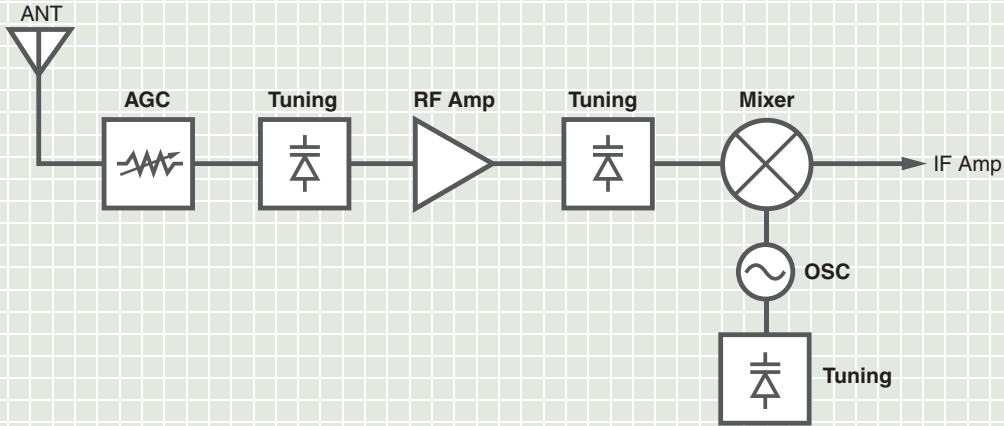
Application	Type	Package	Part Number	
AGC	PIN diode	Single	S-Mini	1SV128
			USC	1SV271
				1SV307 JDP2S10U*
		ESC	1SV308 JDP2S04E	
		Dual	S-Mini	1SV172
			SMQ	1SV237
			USM	1SV252
USQ	1SV312			

* New product

Application	Type	Package	Part Number
AGC	Bipolar transistor	S-Mini	2SC2712
RF Amp	J-FET	S-Mini	2SK711
		USM	2SK1875
	Dual transistor	SMV	HN3G01J

Application	Type	Package	Part Number
Mixer	Bipolar transistor	S-Mini	2SC2715 2SC2716

1-2 Radio-Frequency Devices for FM Tuners



Application	Type	Package	Part Number	
AGC	PIN diode	Single	S-Mini	1SV128
			USC	1SV271
				1SV307
		ESC	JDP2S10U*	
			1SV308	
			JDP2S04E	
	Schottky barrier diode	Dual	S-Mini	1SV172
			SMQ	1SV237
			USM	1SV252
		Single	USQ	1SV312
			USC	1SS315
			fSC	JDH2S01FS
Dual	S-Mini	1SS295		
	SSM	JDH3D01S		
	VESM	JDH3D01FV		

* New product

Application	Type	Package	Part Number
RF Amp	Bipolar transistor	PW-Mini	MT3S20P*
			MT3S21P*
			MT3S22P*
		S-Mini	2SC2714
			MT3S19*
		USM	2SC4215
		UFM	MT3S15TU*
	MT3S19TU*		
	MT3S20TU*		
	J-FET	S-Mini	2SK211
			2SK210

* New product

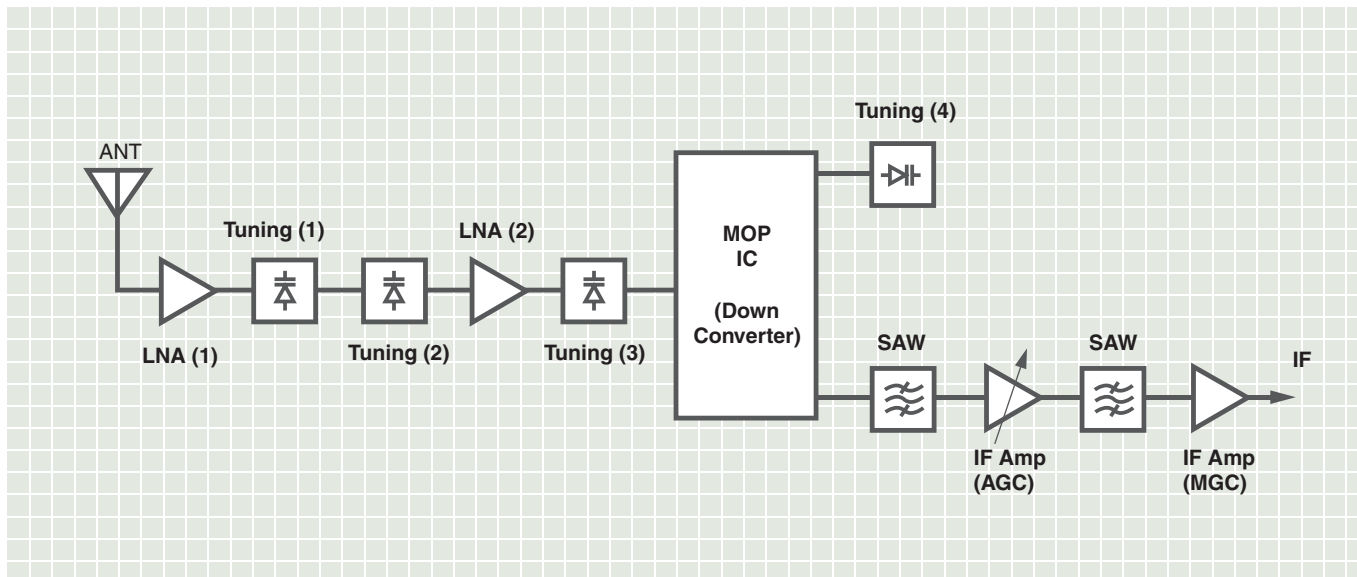
Application	Type	Package	Part Number	
Tuning	Varicap diode	Dual	S-Mini	1SV225
			1SV228	
			JDV3C34	

Application	Type	Package	Part Number
Mixer	Bipolar transistor	S-Mini	2SC2714
		USM	2SC4215
		SSM	2SC4915

Application	Type	Package	Part Number
OSC	Bipolar transistor	S-Mini	2SC2714
		USM	2SC4215
		SSM	2SC4915



1. Recommended Products by Application

1-3 Radio-Frequency Devices for Digital Terrestrial Tuners



Application	Type	Package	Part Number		
LNA (1)	Bipolar transistor	S-Mini	2SC5084	MT3S19*	
		SMQ	2SC5087	2SC5087R**	
		PW-Mini	MT3S20P*	MT3S21P*	MT3S22P*
		UFM	MT3S15TU*	MT3S19TU*	MT3S20TU*

* New product ** SMQ(R) package

Application	Type	Band	Package	Internal Connection	Part Number	
Tuning (1) (Band switch)	Single	VHF and wideband VHF	USC	—	1SS314	
			ESC		1SS381	
	Dual		S-Mini	Common anode		1SS269
			USM			1SS268
			USM	Common cathode		1SS313
			SSM			1SS312
1SS364						

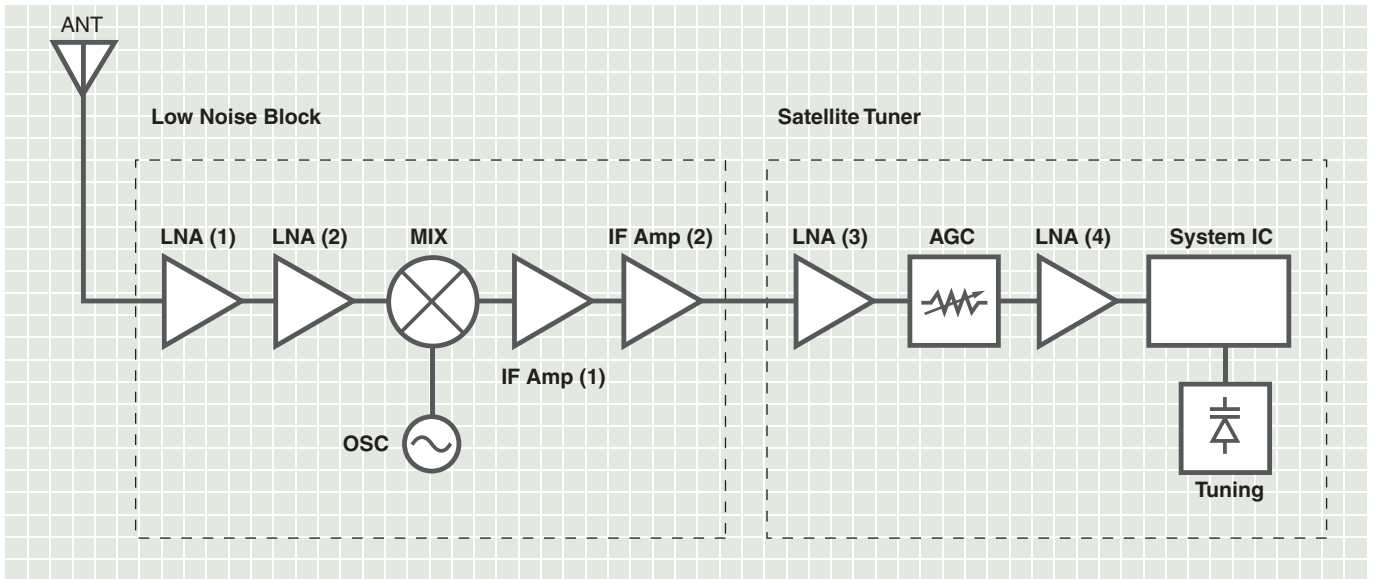
Application	Type	Band	Package	Part Number			
Tuning (2) Tuning (3) Tuning (4)	Varicap diode	Wideband VHF	USC	1SV215	1SV231	1SV232	1SV262
				1SV269	1SV288		
		UHF	ESC	1SV282	1SV283B	1SV290B	
				USC	1SV214		
1SV278B							

Application	Type	Package	Part Number	
LNA (2)	Dual Gate MOS FET	SMQ	3SK291	3SK293
		USQ	3SK292	3SK294

Application	Type	Package	Part Number
IF Amp	Si cell pack	MGC	TU6
		MGC	SM8
		AGC	SM8

MGC: Gain is adjusted by an external resistor.
AGC: Gain is adjusted by voltage.

1-4 Radio-Frequency Devices for Satellite Broadcast Tuners



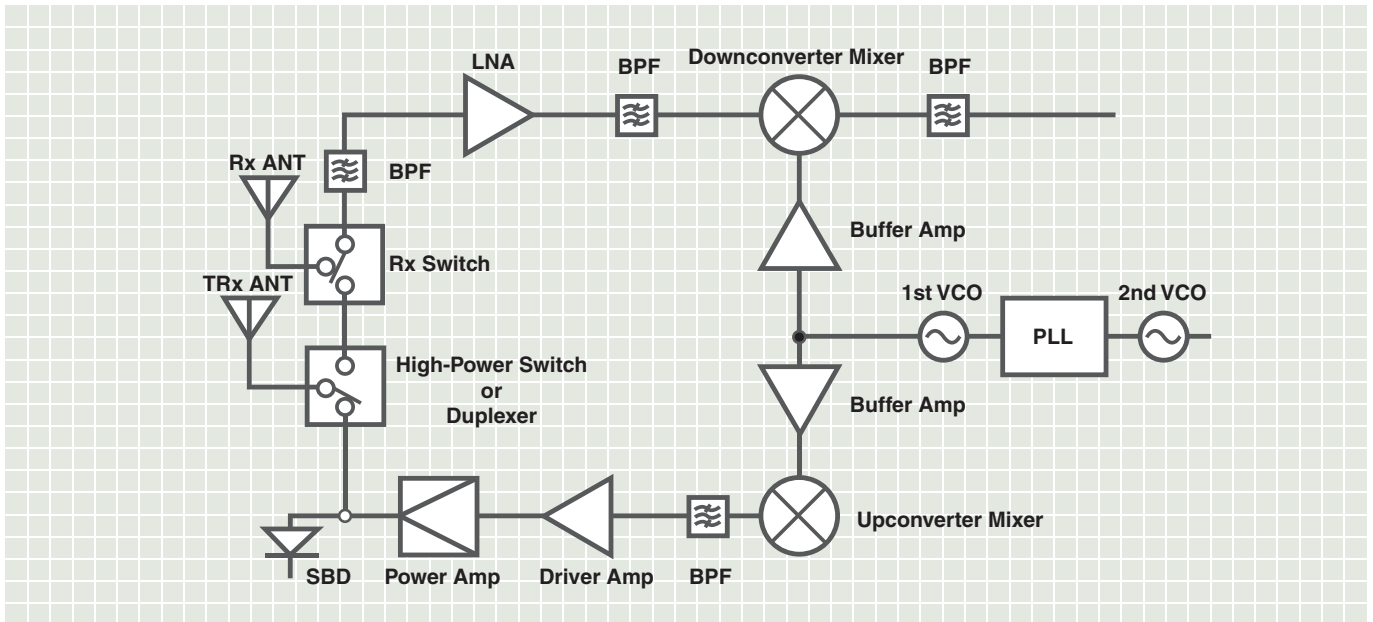
Application	Type	Package	Part Number
IF Amp (2) LNA (3) LNA (4)	Bipolar transistor	SMQ	MT4S03A
		USQ	2SC5319 MT4S03AU

Application	Type	Package	Part Number
AGC	PIN diode	ESC	JDP2S04E

Application	Type	Package	Part Number
Tuning	Varicap diode	ESC	1SV283B

1. Recommended Products by Application

1-5 Radio-Frequency Devices for Cell Phones (800 MHz/2 GHz)



Application	Type	Package	Part Number
Rx Switch	PIN diode	fSC	JDP2S02AFS JDP2S05FS
		CST2	JDP2S02ACT JDP2S05CT
		SC2	JDP2S08SC

Application	Package Type	USC	fSC	SSM	VESM
		1SS315	JDH2S01FS	JDH3D01S**	JDH3D01FV**

** Dual

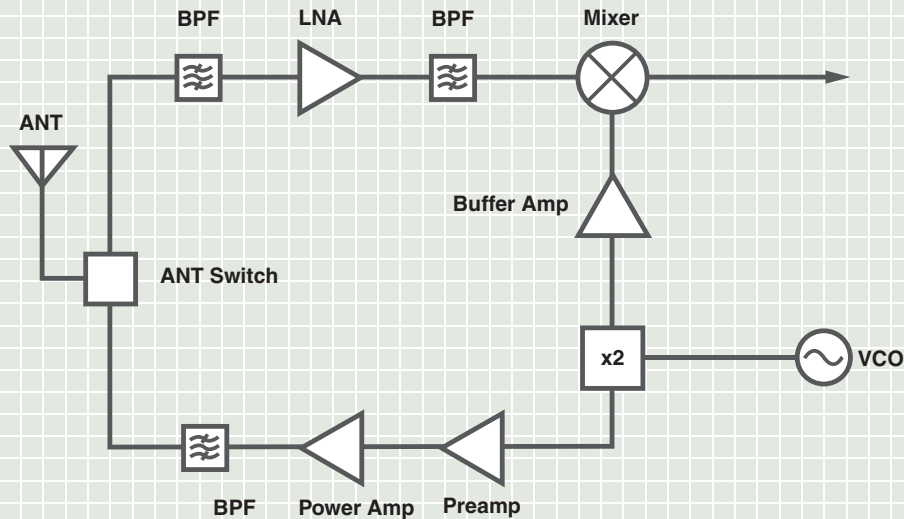
Application	Package Type	USC	ESC	fSC	SC2
		1SV229 1SV270 1SV276 1SV304 1SV310	1SV279 1SV281 1SV284 1SV305 1SV311	JDV2S08FS JDV2S26FS	JDV2S26SC* JDV2S31SC*

* New product

Application	Package		fSM	SMQ	USQ	fS6
	Type					
LNA, Buffer Amp	Bipolar transistor		MT3S03AFS MT3S06FS MT3S07FS MT3S14FS	2SC5087 2SC5092	2SC5088 2SC5098 MT4S06U MT4S32U	
Mixer	Bipolar transistor			2SC5087	2SC5088	
VCO	Bipolar transistor		MT3S03AFS MT3S04AFS MT3S05FS MT3S06FS MT3S07FS MT3S11FS MT3S14FS			MT6L63FS MT6L68FS MT6L71FS MT6L78FS

1. Recommended Products by Application

1-6 Radio-Frequency Devices for Cordless Phones (900 MHz/2.4 GHz/5.8 GHz)

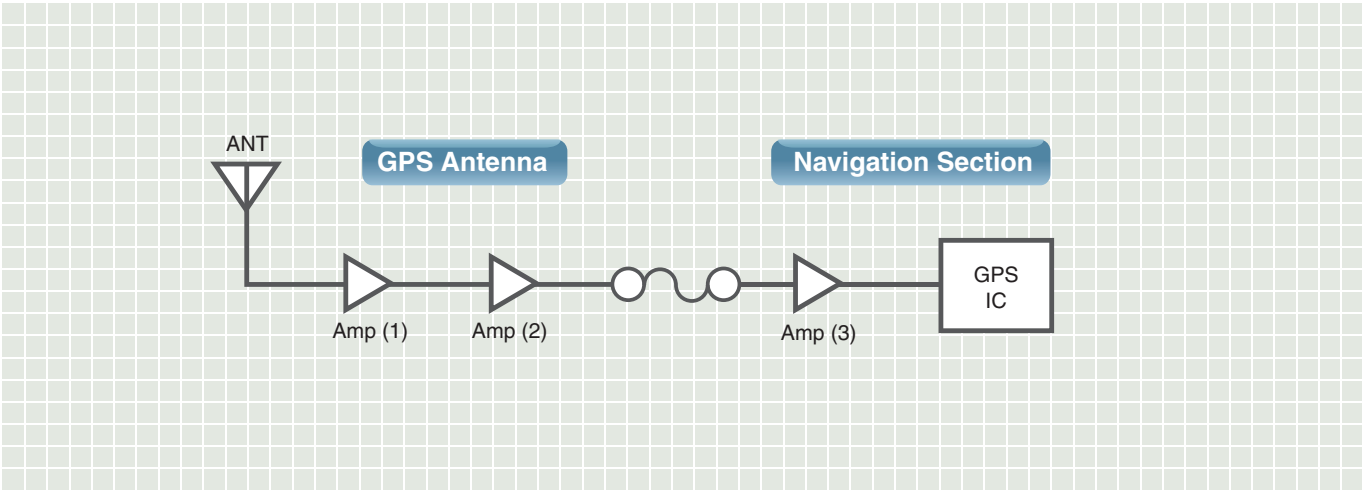


Application		Package	USC	ESC	fSC	CST2	SC2
ANT Switch	900 MHz		1SV271 1SV307 1SS314	JDP2S04E 1SV308 1SS381	JDP2S02AFS	JDP2S02ACT	JDP2S08SC
	2.4 GHz		1SV271 1SV307	JDP2S04E 1SV308	JDP2S02AFS JDP2S05FS	JDP2S02ACT JDP2S05CT	
	5.8 GHz				JDP2S02AFS	JDP2S02ACT	
VCO & Varicap diode	900 MHz		1SV214 1SV229 1SV276 1SV304 1SV310	1SV278B 1SV279 1SV284 1SV305 1SV311 1SV314	JDV2S08FS JDV2S09FS JDV2S10FS		
	2.4 GHz			JDV2S01E JDV2S05E	JDV2S05FS JDV2S29FS*		JDV2S29SC
	5.8 GHz				JDV2S29FS*		JDV2S29SC

* New product

Application		Package	USM	SSM	SMQ	USQ
VCO Buffer Amp Mixer Power Amp Preamp LNA	900 MHz		2SC5065 2SC5085 MT3S06U MT3S16U	2SC5066 2SC5086 MT3S06S	2SC5087	2SC5088 MT4S06U
	2.4 GHz		MT3S06U	MT3S06S		2SC5319 MT4S06U MT4S32U

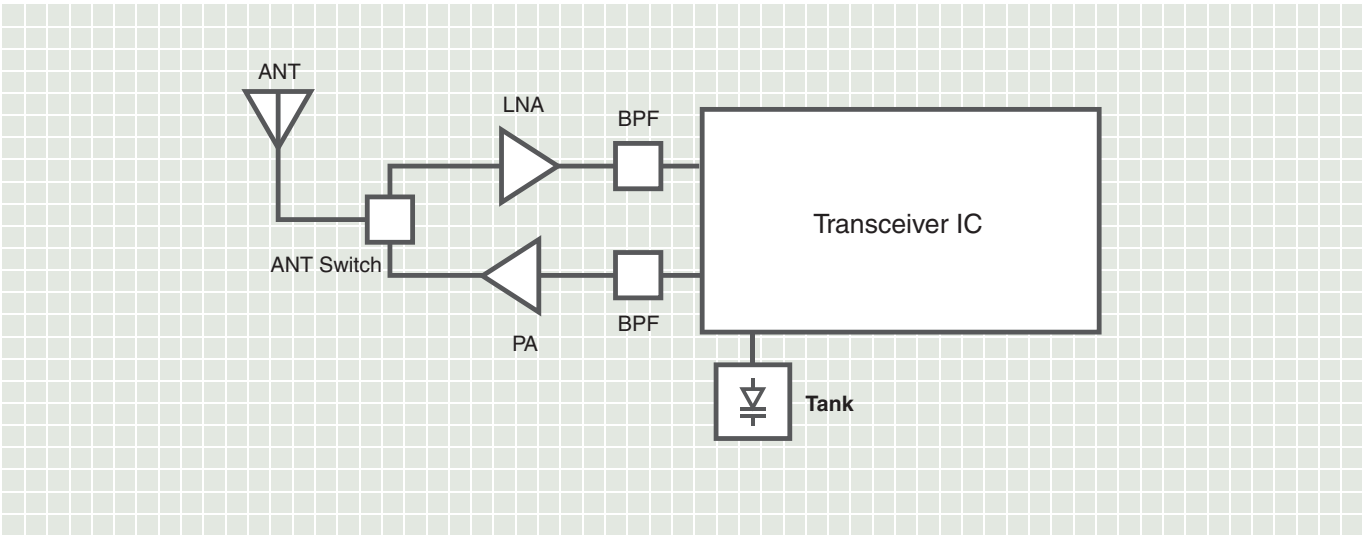
1-7 Radio-Frequency Devices for Global Positioning Systems (GPS)



Navigation Section

Application	Package		USQ
	Type		
Amp (3)	Bipolar transistor		2SC5319 MT4S32U

1-8 Radio-Frequency Devices for Wireless LAN and Bluetooth™



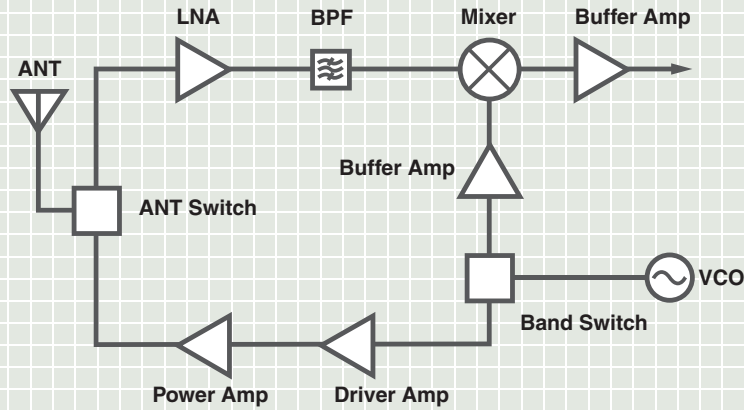
Application	Package		ESC	fSC	SC2
	Type				
VCO	Varicap diode		1SV314 1SV329 JDV2S01E JDV2S05E	JDV2S10FS JDV2S13FS JDV2S05FS JDV2S29FS*	JDV2S29SC

* Bluetooth™ is a trademark owned Bluetooth SIG, Inc.

* New product

1. Recommended Products by Application

1-9 Radio-Frequency Devices for FRS and GMRS



Application	Package System	USC	ESC	fSC	CST2	SC2
		ANT Switch	1SS314 1SV271 1SV307	1SS381 JDP2S04E 1SV308	JDP2S02AFS JDP2S05FS	JDP2S02ACT JDP2S05CT
VCO	FRS, GMRS	1SV214 1SV229 1SV276 1SV304	1SV278B 1SV279 1SV284 1SV305 1SV282	JDV2S08FS JDV2S26FS		JDV2S26SC
Application	Package System	USM	SSM	SMQ	USQ	S-Mini
		VCO Driver Amp Buffer Amp Mixer LNA	FRS, GMRS	2SC5065 2SC5085 MT3S06U	2SC5066 2SC5086 MT3S06S	2SC5087
Application	Package System	UFM	PW-Mini			
		VCO Driver Amp Buffer Amp Mixer LNA	FRS, GMRS	MT3S15TU* MT3S19TU* MT3S20TU*	MT3S21P* MT3S22P* MT3S20P*	

* New product

Application	Package System	PW-Mini	PW-X	RF-CST3
		Power Amp	FRS	2SK3078A 2SK3656
	GMRS	2SK3756*	2SK3079A	RFM03U3CT*

* New product

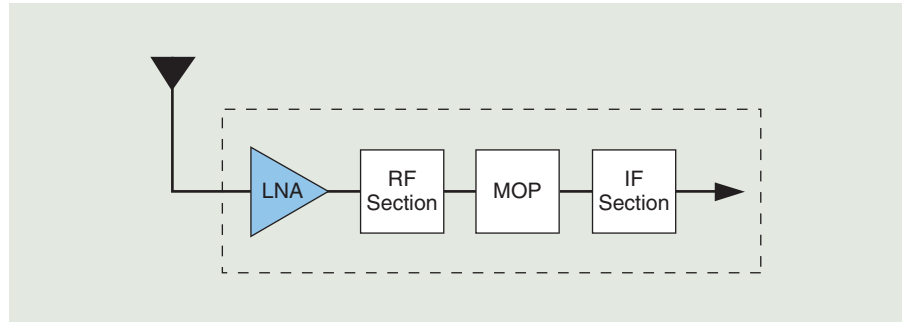
2. Product Lines

2-1 Microwave Transistors

- Extends the portfolio of transistors for silicon LNA applications.
- Available in the UFM and PW-Mini packages with high power dissipation capability.
- Low distortion, low noise and high gain

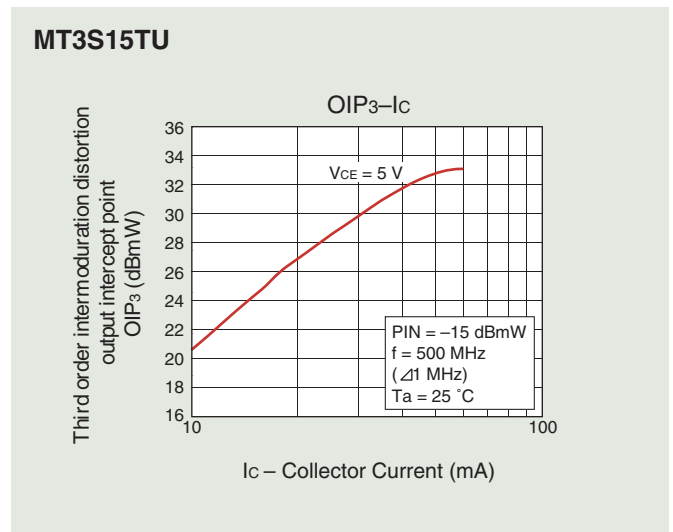
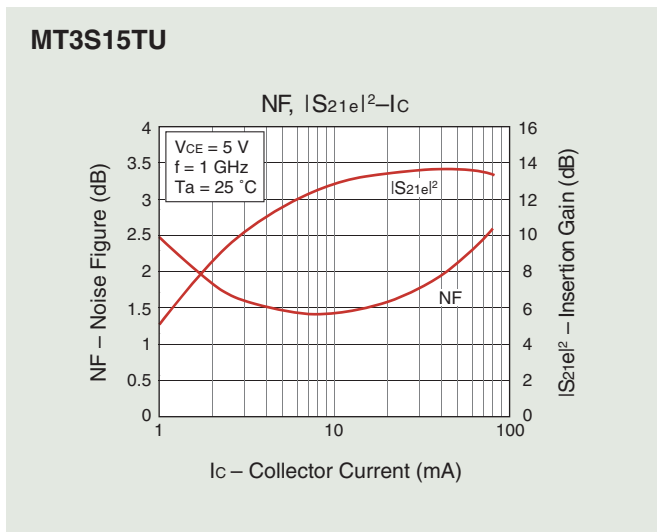
Applications

- LNAs for tabletop tuners (RF and IF sections)
- Automotive antenna LNAs (for FM and digital terrestrial broadcasting)
- LNA/drivers for FRS/GMRS radios



Tuner Block

Typical Characteristics



Electrical Characteristics

Part Number	Absolute Maximum Ratings			Electrical Characteristics												Package
	V _{CEO} (V)	I _c (mA)	P _C *1 (mW)	C _{re} (typ.) (pF)	f _T (typ.) (GHz)		S _{21eI} ² (typ.) (dB)			NF (typ.) (dB)						
					V _{CE} (V)	I _c (mA)	V _{CE} (V)	I _c (mA)	f (GHz)	V _{CE} (V)	I _c (mA)	f (GHz)				
MT3S15TU*	6	80	900	0.6	11.5	5	50	13.5	5	50	1	1.60	5	20	1	UFM
MT3S19TU*	6	80	900	0.7	11.0	5	50	13.0	5	50	1	1.50	5	20	1	
MT3S20TU*	12	80	900	0.75	7.0	5	30	11.5	5	50	1	1.45	5	20	1	
MT3S20P*	12	80	1800	0.85	7.0	5	30	11.0	5	50	1	1.45	5	20	1	PW-Mini
MT3S21P*	6	80	1800	0.85	9.0	5	50	11.0	5	50	1	1.55	5	20	1	
MT3S22P*	6	80	1800	1.0	8.5	5	50	10.5	5	50	1	1.50	5	20	1	

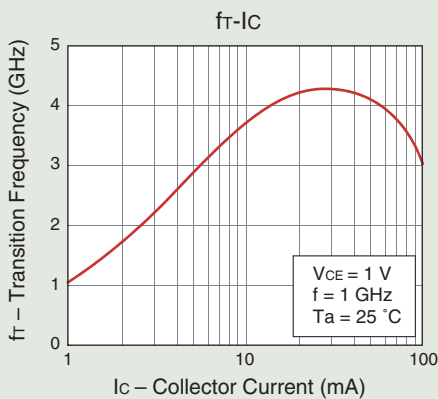
*1 When mounted on a ceramic pcb measuring 25.4 x 25.4 x 0.8 (mm).

* New product

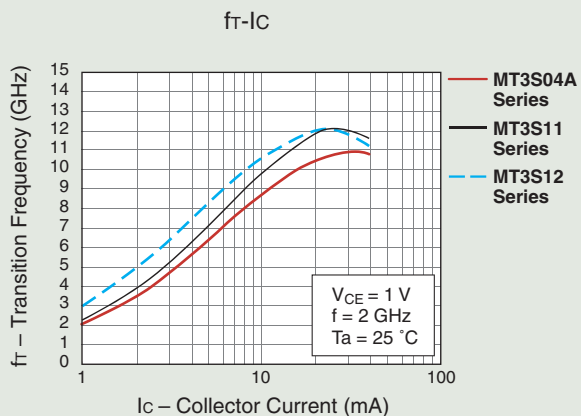
2. Product Lines

Transistors with $f_T = 4$ GHz

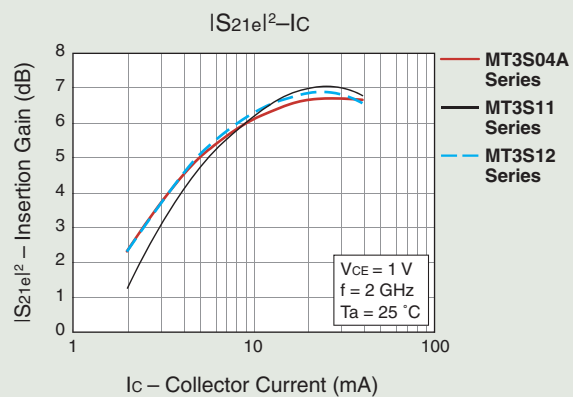
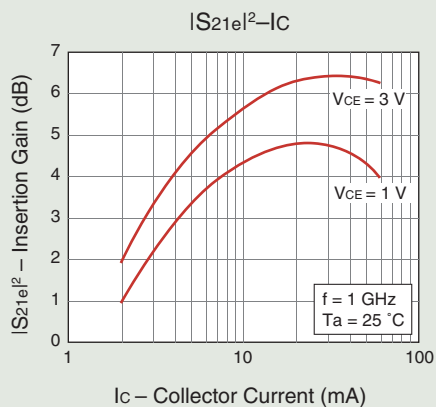
MT3S16FS



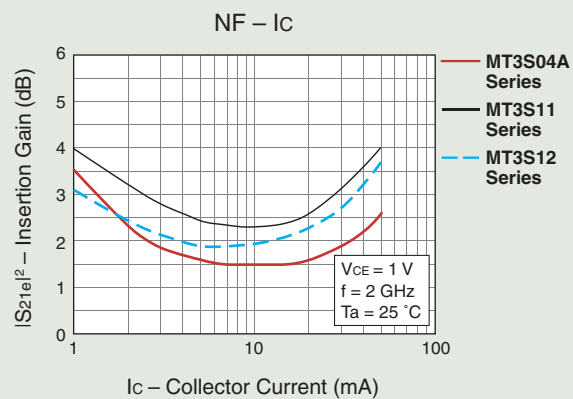
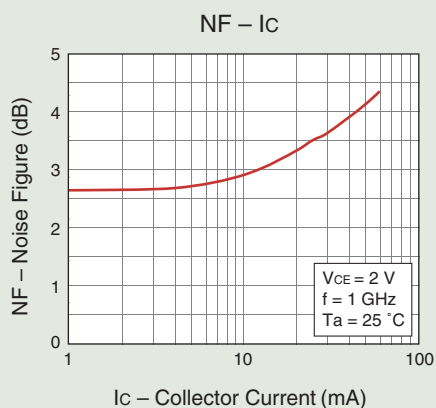
Transistors with $f_T = 7$ GHz



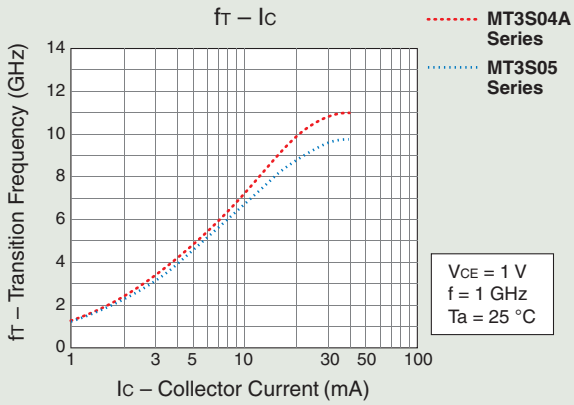
MT3S16FS



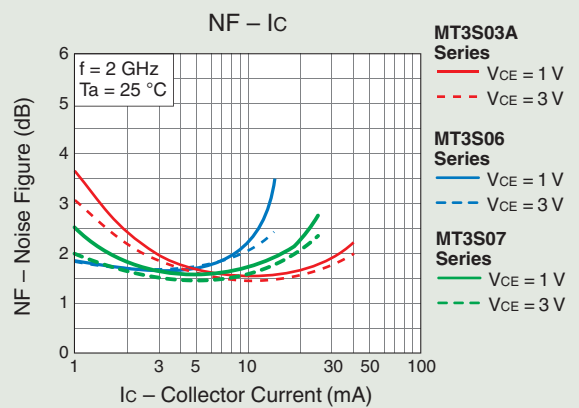
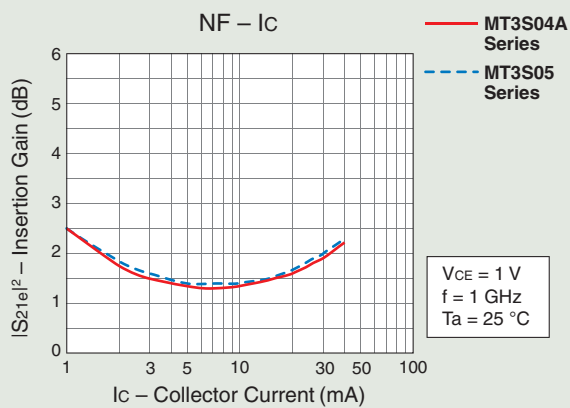
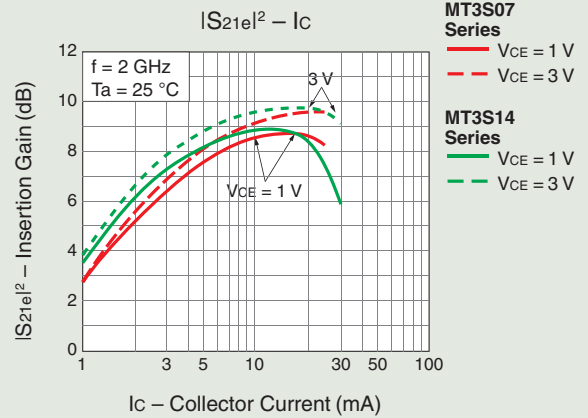
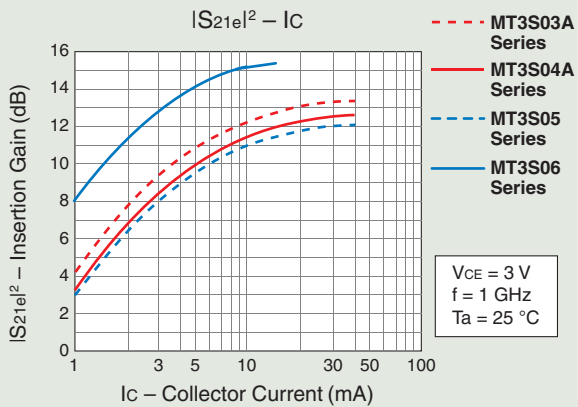
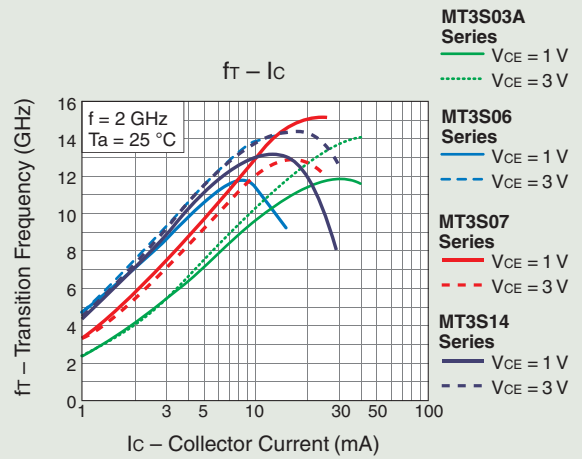
MT3S16FS



Transistors with $f_T = 7$ to 10 GHz



Transistors with $f_T = 10$ to 12 GHz

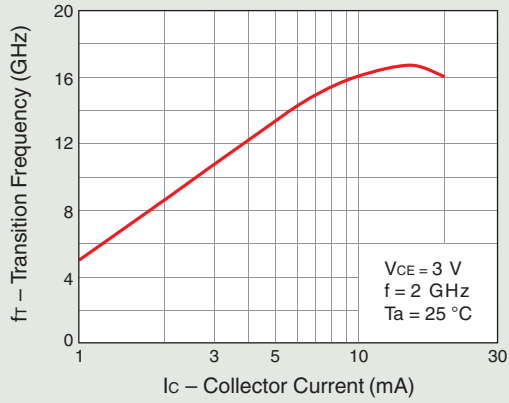


2. Product Lines

Transistors with $f_T = 16$ GHz

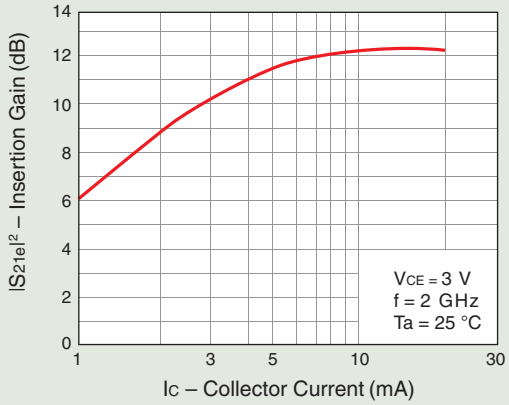
2SC5319

$f_T - I_C$



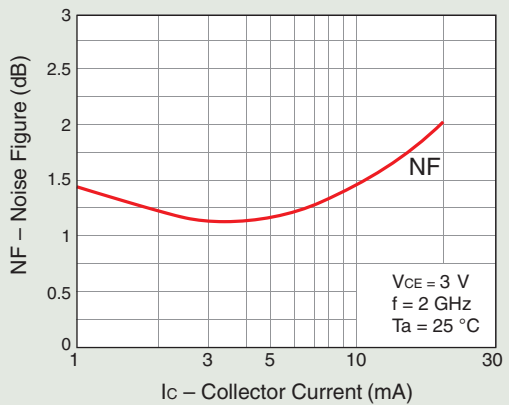
2SC5319

$|S_{21e}|^2 - I_C$



2SC5319

NF - I_C



■ Transistors for AM/FM Tuners

Electrical Characteristics

Application	Part Number	Absolute Maximum Ratings			Electrical Characteristics								Package
		V _{CEO} (V)	I _c (mA)	P _c (mW)	h _{FE}		f _r typ. (min)			C _{re} (Cob) (pF)			
					V _{CE} (V)	I _c (mA)	(MHz)	V _{CE} (V)	I _c (mA)				
FM RF, MIX/OSC	2SC2714	30	20	100	40 to 200	6	1	550	6	1	0.7	S-Mini	
	2SC4215											USM	
	2SC4915											SSM	
FM IF/AM CONV, IF	2SC2715	30	50	150	40 to 240	12	2	(100)	10	1	(2.0)	S-Mini	
AM RF, CONV	2SC2716	30	100	150	40 to 240	12	2	(80)	10	2	2.2	S-Mini	
AM CONV, IF	2SC2712	50	150	150	70 to 700	6	2	(80)	10	1	(2.0)	S-Mini	
	2SC4116			100								USM	

■ Transistors for TV Tuners

Electrical Characteristics

Application	Part Number	Absolute Maximum Ratings			Electrical Characteristics										Package	
		V _{CEO} (V)	I _c (mA)	P _c (mW)	h _{FE}		f _r (typ.)			G _c /NF (typ.)			C _{re} (pF)			
					V _{CE} (V)	I _c (mA)	(MHz)	V _{CE} (V)	I _c (mA)	(dB/dB)	V _{CC} (V)	I _c (mA)		f (MHz)		
VHF MIX	2SC3123	20	50	150	40 to 300	10	5	1400	10	5	23 / 3.8	12	3	200	0.4	S-Mini
	2SC4250			100							25 / 4.3				0.45	USM

■ Transistors for VHF/UHF Mixers and Low-Noise Amplifiers

Packaging

Application	S-Mini	USM	SSM	fSM	SMQ	USQ
f _r = 4 GHz high-current device	–	MT3S16U	–	MT3S16FS	–	–
f _r = 7 GHz high-current device	2SC5084	2SC5085	2SC5086	–	2SC5087 2SC5087R**	2SC5088
f _r = 7 GHz medium-current device	–	2SC5463	2SC5464	–	–	–
f _r = 7 GHz low-current device	2SC5064	2SC5065	2SC5066	–	–	–
f _r = 10 GHz high-current device	2SC5089	2SC5090	2SC5091	–	2SC5092	2SC5093
f _r = 10 GHz low-current device	2SC5094	2SC5095	2SC5096	–	2SC5097	2SC5098
f _r = 16 GHz high-current device	–	–	–	–	–	2SC5319
f _r = 6 GHz low-voltage device	–	–	–	MT3S11FS	–	–
f _r = 7 GHz low-voltage device	MT3S04A	MT3S04AU	MT3S04AS	MT3S04AFS	MT4S04A	MT4S04AU
	–	–	–	–	–	–
f _r = 10 GHz low-voltage device	MT3S03A	MT3S03AU	MT3S03AS	MT3S03AFS	MT4S03A	MT4S03AU
	–	MT3S06U	MT3S06S	MT3S06FS	MT4S06	MT4S06U
f _r = 12 GHz low-voltage device	–	MT3S07U	–	MT3S07FS	–	–
f _r = 15 GHz low-voltage device	–	–	–	MT3S14FS	–	–
f _r = 16 GHz low-voltage device	–	–	–	–	–	MT4S32U

** SMQ(R) package

2. Product Lines

■ Transistors for VHF/UHF Mixers and Low-Noise Amplifiers Electrical Characteristics

Application	Part Number	Absolute Maximum Ratings			Electrical Characteristics													Package		
		V _{CEO}	I _c	P _c	C _{ob}	C _{re}	f _T (typ.)			S ₂₁ e ² (typ.)			NF (typ.)							
		(V)	(mA)	(mW)	(pF)	(pF)	(GHz)	V _{CE} (V)	I _c (mA)	(dB)	V _{CE} (V)	I _c (mA)	f (GHz)	(dB)	V _{CE} (V)	I _c (mA)	f (GHz)			
f _T = 4 GHz high-current device	MT3S16U	5	60	100	-	2.4	4	3	10	5.5	3	30	1	2.4	2	5	1	USM		
	50			fSM																
f _T = 7 GHz high-current device	2SC5084	12	80	150	1	0.65	7	10	20	11	10	20	1	1.1	10	5	1	S-Mini		
	2SC5085			100														USM		
	2SC5086			100														SSM		
	2SC5087			150														1.1	13	SMQ
	2SC5088			100														USQ		
	2SC5087R			150														-	8	30
f _T = 7 GHz medium-current device	2SC5463	12	60	100	0.75	0.5	7	8	15	12	8	15	1	1.1	8	5	1	USM		
	2SC5464			SSM																
f _T = 7 GHz low-current device	2SC5064	12	30	150	0.7	0.45	7	5	10	12	5	10	1	1.1	5	3	1	S-Mini		
	2SC5065			100														USM		
	2SC5066			SSM																
f _T = 10 GHz high-current device	2SC5089	10	40	150	0.7	0.5	10	8	20	7	8	20	2	1.7	8	5	2	S-Mini		
	2SC5090			100														USM		
	2SC5091			100														SSM		
	2SC5092			150														0.5	0.35	10
f _T = 10 GHz low-current device	2SC5095	10	15	100	0.5	0.4	10	6	7	7.5	6	7	2	1.8	6	3	2	USM		
	2SC5096			SSM																
f _T = 16 GHz high-current device	2SC5319	5	20	100	0.6	0.4	15	3	15	11.5	3	15	2	1.3	3	5	2	USQ		

■ Transistors for VHF/UHF Mixers and Low-Noise Amplifiers
Electrical Characteristics

Application	Part Number	Absolute Maximum Ratings			Electrical Characteristics												Package	
		V _{CEO}	I _c	P _c	C _{ob}	C _{re}	f _r (typ.)			S _{21e} ² (typ.)			NF (typ.)					
		(V)	(mA)	(mW)	(pF)	(pF)	(GHz)	V _{CE} (V)	I _c (mA)	(dB)	V _{CE} (V)	I _c (mA)	f (GHz)	(dB)	V _{CE} (V)	I _c (mA)		f (GHz)
f _r = 6 GHz low-voltage device	MT3S11FS	6	40	50	–	0.65	6	1	5	6.5	3	20	2	2.4	1	5	2	fSM
f _r = 7 GHz low-voltage device	MT3S04A	5	40	150	–	0.8	7	3	7	12.5	3	20	1	1.2	3	7	1	S-Mini
	MT3S04AU			100														USM
	MT3S04AS			50														SSM
	MT3S04AFS			150														fSM
	MT4S04A			100														SMQ
	MT4S04AU			13.5														USQ
f _r = 10 GHz low-voltage device	MT3S03A	5	40	150	–	0.75	10	3	10	8	3	20	2	1.4	3	7	2	S-Mini
	MT3S03AU			100														USM
	MT3S03AS			50														SSM
	MT3S03AFS			150														fSM
	MT4S03A			100														SMQ
	MT4S03AU			9														USQ
	MT3S06S	5	15	60	–	0.25	10	3	5	9.5	3	7	2	1.6	3	3	2	SSM
	MT3S06FS			50														fSM
	MT4S06			60														SMQ
	MT4S06U			11.5														USQ
f _r = 12 GHz low-voltage device	MT3S07U	5	25	100	–	0.4	12	3	10	9.5	3	15	2	1.5	3	5	2	USM
	MT3S07FS			50														fSM
f _r = 15 GHz low-voltage device	MT3S14FS	2.5	30	50	–	0.35	11	1	5	10	3	15	2	1.7	1	5	2	fSM
f _r = 16 GHz low-voltage device	MT4S32U	4.5	15	67.5	0.4	0.2	16	3	10	13.5	3	10	2	1.4	3	3	2	USQ

2. Product Lines

■ Transistors for VHF/UHF Oscillators Packaging

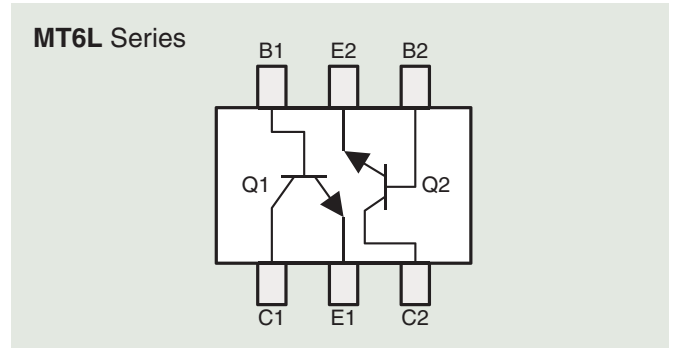
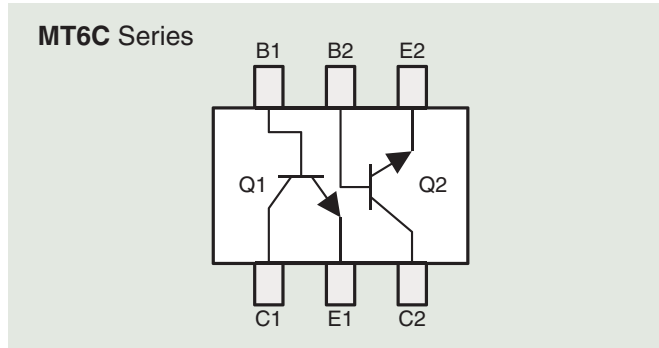
Application	S-Mini	USM	SSM	fSM	SMQ	USQ
f _T = 5 GHz high-current device	2SC5109	2SC5110	2SC5111	-	-	-
f _T = 6 GHz low-current device	2SC5106	2SC5107	2SC5108	-	-	-
f _T = 7 GHz low-voltage device	MT3S04A	MT3S04AU	MT3S04AS	MT3S04AFS	MT4S04A	MT4S04AU
	-	-	-	MT3S05FS	-	-
	-	-	-	MT3S11FS*	-	-
	-	-	-	-	-	-
f _T = 10 GHz low-voltage device	MT3S03A	MT3S03AU	MT3S03AS	MT3S03AFS	MT4S03A	MT4S03AU

* New product

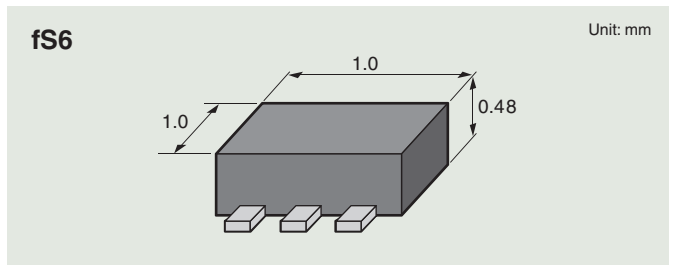
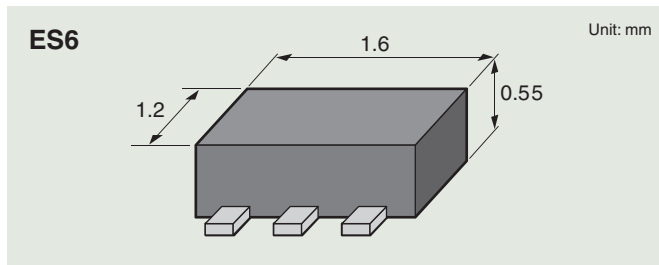
■ Transistors for VHF/UHF Oscillators Electrical Characteristics

Application	Part Number	Absolute Maximum Ratings			Electrical Characteristics												Package																		
		V _{CEO}	I _c	P _c	C _{ob}	C _{re}	f _T (typ.)			S _{21e} ² (typ.)			NF (typ.)																						
		(V)	(mA)	(mW)	(pF)	(pF)	(GHz)	V _{CE} (V)	I _c (mA)	(dB)	V _{CE} (V)	I _c (mA)	f (GHz)	(dB)	V _{CE} (V)	I _c (mA)		f (GHz)																	
f _T = 5 GHz high-current device	2SC5109	10	60	150	0.9	0.7	5	5	5	10	5	5	1	-	-	-	-	S-Mini																	
	2SC5110			100															SSM																
	2SC5111			100																															
f _T = 6 GHz low-current device	2SC5106	10	30	150	0.7	0.5	6	5	5	11	5	5	1	-	-	-	-	S-Mini																	
	2SC5107			100															SSM																
	2SC5108			100																															
f _T = 7 GHz low-voltage device	MT3S04A	5	40	150	-	0.8	7	3	7	12.5	3	20	1	1.2	3	7	1	S-Mini																	
	MT3S04AU			100															USM																
	MT3S04AS			50																															
	MT3S04AFS			150																															
	MT4S04A			150																															
	MT4S04AU			100																															
	MT3S05FS			5																40	50	-	0.9	4.5	1	5	8.5	1	5	1	1.4	1	5	1	fSM
	MT3S11FS			6																40	50	-	0.65	6	1	5	6.5	3	20	2	2.4	1	5	2	fSM
f _T = 10 GHz low-voltage device	MT3S03A	5	40	150	-	0.75	10	3	10	8	3	20	2	1.4	3	7	2	S-Mini																	
	MT3S03AU			100															USM																
	MT3S03AS			50																															
	MT3S03AFS			150																															
	MT4S03A			150																															
	MT4S03AU			100																															
MT4S03AS	5	40	50	-	0.7	10	3	10	9	3	20	2	1.4	3	7	2	fSM																		
MT4S03AFS	6	40	50	-	0.65	6	1	5	6.5	3	20	2	2.4	1	5	2	fSM																		
MT4S03A	5	40	50	-	0.9	4.5	1	5	8.5	1	5	1	1.4	1	5	1	fSM																		
MT4S03AU	6	40	50	-	0.65	6	1	5	6.5	3	20	2	2.4	1	5	2	fSM																		
MT4S03AS	5	40	50	-	0.9	4.5	1	5	8.5	1	5	1	1.4	1	5	1	fSM																		
MT4S03AFS	6	40	50	-	0.65	6	1	5	6.5	3	20	2	2.4	1	5	2	fSM																		
MT4S03A	5	40	50	-	0.9	4.5	1	5	8.5	1	5	1	1.4	1	5	1	fSM																		
MT4S03AU	6	40	50	-	0.65	6	1	5	6.5	3	20	2	2.4	1	5	2	fSM																		

Pin Assignment for Dual-Transistor Devices



Package Dimensions for Dual-Transistor Devices



Dual-Transistor Devices (MT Series) Packaging

Application	ES6	fS6
VHF/UHF Buffer + OSC	-	MT6L05FS
	-	MT6L11FS
	-	MT6L55FS
	MT6L57AE	-
	MT6L58AE	-
	MT6L62AE	-
	-	MT6L63FS
	-	MT6L68FS
	-	MT6L71FS
	-	MT6L78FS
	MT6C04AE	-

Dual-Transistor Devices (MT Series) Electrical Characteristics

Application	Part Number	Tr	V _{CEO} (V)	I _C (mA)	P _C *1 (mW)	hFE		f _T (typ.)			NF (typ.)			Constituent Parts	Package		
						V _{CE} (V)	I _C (mA)	(GHz)	V _{CE} (V)	I _C (mA)	(dB)	V _{CE} (V)	I _C (mA)			f (GHz)	
VHF/UHF Buffer + OSC	MT6L05FS		5	40	50	80 to 140	1	5	4.5	1	5	1.4	1	5	1	MT3S05FS x 2	fS6
	MT6L11FS		6	40	50	100 to 160	1	5	6	1	5	2.4	1	5	2	MT3S11FS x 2	fS6
	MT6L55FS	Q1	5	25	50	70 to 140	1	5	12	3	10	1.5	3	5	2	MT3S07FS	fS6
		Q2	5	40		80 to 140	1	5	4.5	1	5	1.4	1	5	1	MT3S05FS	
	MT6L57AE	Q1	5	15	100	70 to 140	1	5	10	3	5	1.6	3	3	2	MT3S06FS	ES6
		Q2	5	40		80 to 160	1	5	7	3	7	1.2	3	7	1	MT3S04AFS	
	MT6L58AE	Q1	5	15	100	70 to 140	1	5	10	3	5	1.6	3	3	2	MT3S06FS	ES6
		Q2	5	40		80 to 160	1	5	10	3	10	1.4	3	7	2	MT3S03AFS	

*1 Total P_C

2. Product Lines

■ Dual-Transistor Devices (MT Series)

Electrical Characteristics

Application	Part Number	Tr	V _{CEO} (V)	I _c (mA)	P _C *1 (mW)	hFE			f _r (typ.)			NF (typ.)			Constituent Parts	Package		
						V _{CE} (V)	I _c (mA)	(GHz)	V _{CE} (V)	I _c (mA)	(dB)	V _{CE} (V)	I _c (mA)	f (GHz)				
VHF/UHF Buffer + OSC	MT6L62AE	Q1	5	25	100	70 to 140	1	5	12	3	10	1.5	3	5	2	MT3S07FS	ES6	
		Q2	5	40		80 to 160	1	5	10	3	10	1.4	3	7	2	MT3S03AFS		
	MT6L63FS	Q1	5	25	50	70 to 140	1	5	12	3	10	1.5	1	5	2	MT3S07FS	fS6	
		Q2	6	40		80 to 160	1	5	6	1	5	2.4	1	5	2	MT3S11FS		
	MT6L68FS	Q1	5	15	50	70 to 140	1	5	10	3	5	1.7	1	3	2	MT3S06FS	fS6	
		Q2	6	40		100 to 160	1	5	6	1	5	2.4	1	5	2	MT3S11FS		
	MT6L71FS	Q1	5	25	50	70 to 140	1	5	12	3	10	1.5	3	5	2	MT3S07FS	fS6	
		Q2	6	40		100 to 160	1	5	6	1	5	2.4	1	5	2	MT3S11AFS		
	MT6L78FS	Q1	6	40	50	100 to 160	1	5	6	1	5	2.4	1	5	2	MT3S11FS	fS6	
		Q2	6	40		100 to 160	1	5	6	1	5	2.4	1	5	2	MT3S11AFS		
	MT6C04AE			5	40	100	80 to 160	1	5	7	3	7	1.2	3	7	1	MT3S04AFS x 2	ES6

*1 Total P_C

2-2 FETs

■ J-FETs for AM/FM Tuners

Electrical Characteristics

Application	Part Number	Absolute Maximum Ratings			Electrical Characteristics										Package
		V _{GDS} ⁻¹ V _{GDO} ⁻² (V)	I _g (mA)	P _D (mW)	I _{DSS} (typ.)			Y _{fs} (typ.)			G _{ps} /NF (typ.)				
					V _{DS} (V)	V _{G1S} / V _{G2S} (V)	@1kHz (mS)	V _{DS} (V)	V _{GS} (V)		(dB/dB)	V _{DS} (V)	V _{GS} (V)	f (MHz)	
FM RF	2SK211	-18*2	10	150	1 to 10	10	0	9	10	0	18/2.5	10	0	100	S-Mini
AM RF	2SK711	-20*1	10	150	6 to 32	5	0	25	5	0	-	-	-	-	S-Mini
	2SK1875			100											USM

■ FETs for VHF/UHF Bands

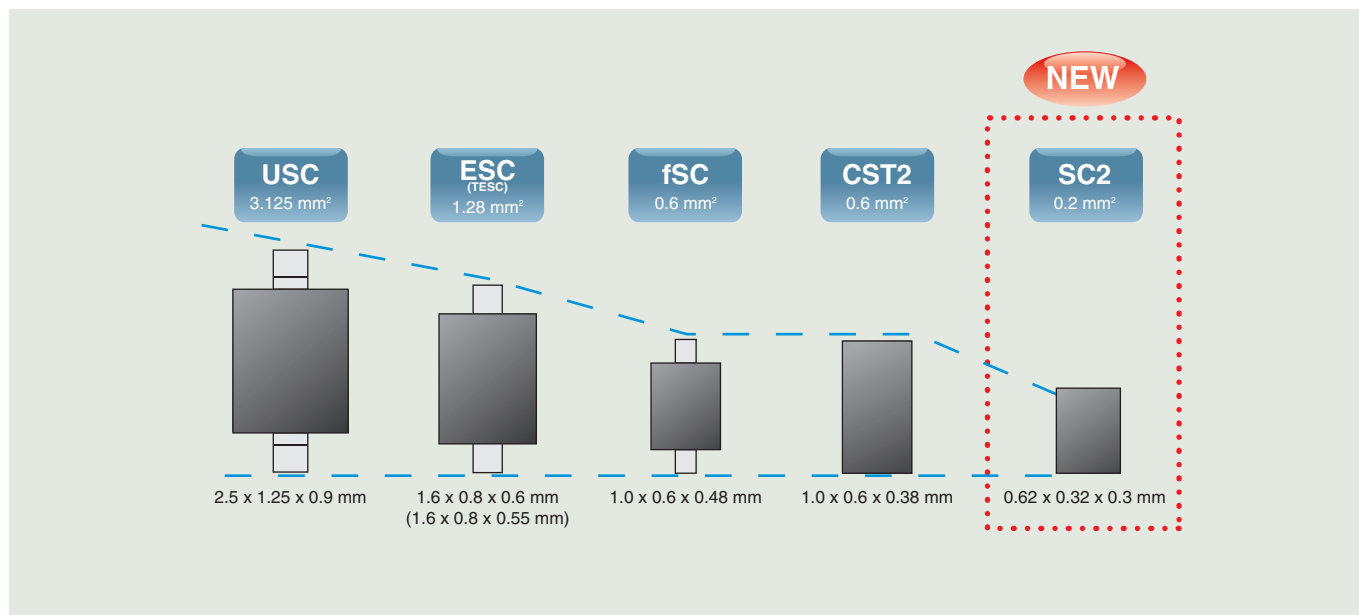
Electrical Characteristics

Application	Part Number	Absolute Maximum Ratings			Electrical Characteristics										Package		
		V _{DS} (V)	I _D (mA)	P _D (mW)	I _{DSS} (typ.)			Y _{fs} (typ.)			G _{ps} (G _{cs})/NF(NF _{cs}) (typ.)						
					V _{DS} (V)	V _{G1S} / V _{G2S} (V)	@1kHz (mS)	V _{DS} (V)	I _D (mA)	V _{G2S} (V)		V _{DS} (V)	I _D (mA)	V _{G2S} (V)	f (MHz)		
VHF RF, MIX	3SK292	12.5	30	150	0 to 0.1	6	0/4.5	23.5	6	10	4.5	21.5/1.8	6	10	4.5	500	SMQ
	3SK294			100													USQ
UHF RF, MIX	3SK291	12.5	30	150	0 to 0.16	6	0/4.5	27	6	10	4.5	23/1.5	6	10	4.5	800	SMQ
	3SK293			100													USQ

2-3 Diodes

- New ultra-thin chip-scale packages : CST3 (1.0 x 0.6 x 0.38 mm) and SC2 (0.62 x 0.32 x 0.3 mm)

■ Package Dimensions



■ Varicap Diodes for VCOs and VCXOs Packaging

Application	USC	ESC	USQ	fSC	SC2
VHF/UHF VCO	1SV229	1SV279**	—	JDV2S41FS*	—
	1SV270	1SV281**	—	—	—
	1SV276	1SV284**	—	—	—
L-Band VCO	1SV239	1SV280**	—	JDV2S40FS*	—
	—	—	—	JDV2S07FS	—
UHF Wideband VCO	1SV304	1SV305	JDV4P08U	JDV2S08FS	—
	1SV310	1SV311	—	JDV2S09FS	—
	—	1SV314	—	JDV2S10FS	—
UHF VCO	—	1SV329	—	JDV2S13FS	—
	—	JDV2S01E	—	—	—
	—	JDV2S05E	—	JDV2S05FS	—
	—	—	—	JDV2S25FS	JDV2S25SC
	—	—	—	JDV2S26FS	JDV2S26SC
	—	—	—	JDV2S29FS*	JDV2S29SC
VCXO	—	—	—	—	JDV2S31SC
	—	—	—	—	JDV2S38SC
	1SV322	1SV323	—	—	—
	1SV324	1SV325	—	—	—
	—	1SV331	—	—	—

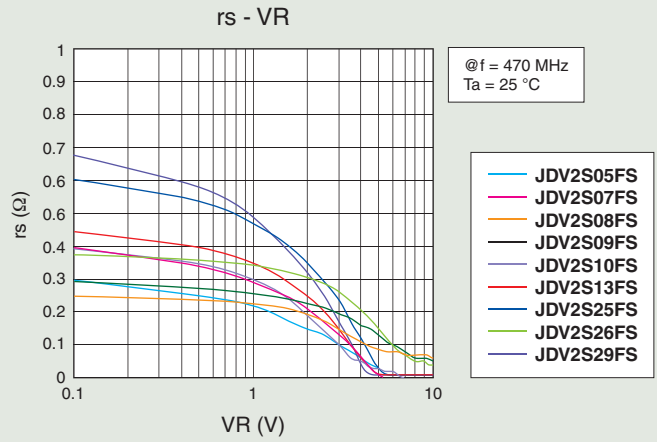
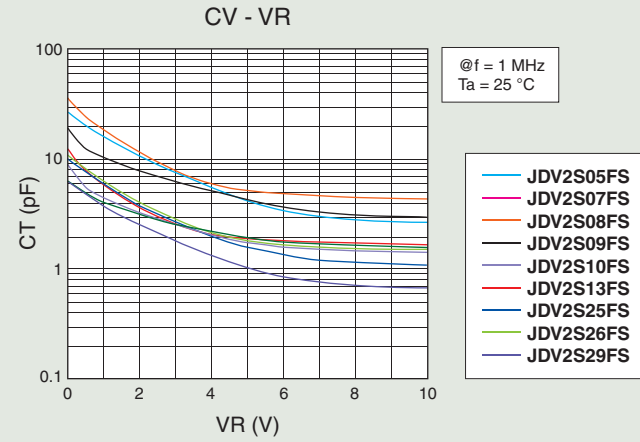
* New product, ** Manufactured at an overseas factory

2. Product Lines

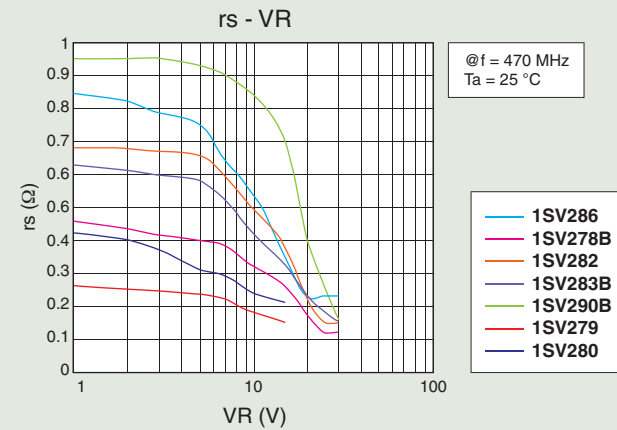
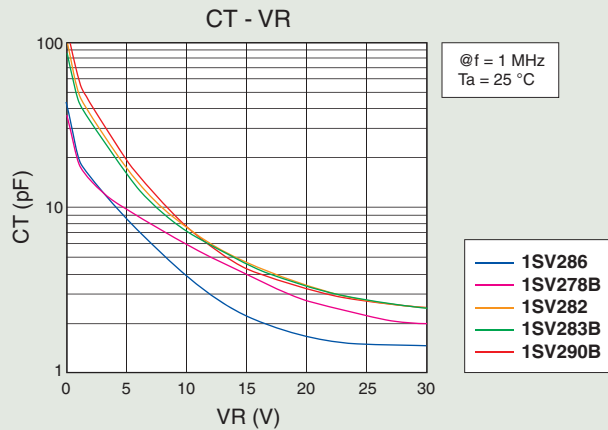
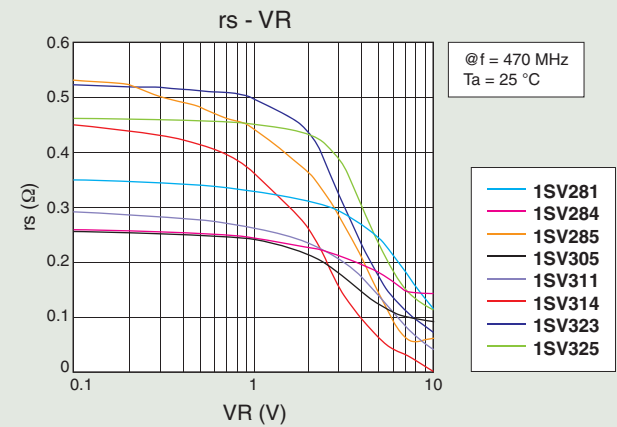
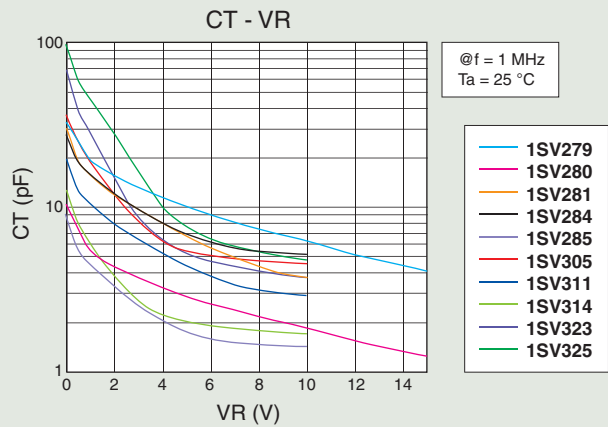
Varicap Diodes for VCOs

Typical Characteristics

fSC



ESC



■ Varicap Diodes for VCOs and VCXOs
Electrical Characteristics

Application	Part Number	V _R (V)	I _R (nA)	C _T (1)		C _T (2)		C _T (1)/C _T (2)	r _s (typ.) (Ω)	rs (typ.)		Package	
				V _R (V)	V _R (V)	V _R (V)	f (MHz)						
VHF/UHF VCO	1SV229	15	3	15	14 to 16	2	5.5 to 6.5	10	2.0 min	0.2	5	470	USC
	1SV279												ESC
	JDV2S41FS*												fSC
	1SV270	10	3	10	15 to 17	1	7.3 to 8.7	4	1.8 min	0.28	1	470	USC
	1SV281												ESC
	1SV276	10	3	10	15 to 17	1	7.0 to 8.5	4	1.8 min	0.22	1	470	USC
	1SV284												ESC
L-Band VCO	1SV239	15	3	15	3.8 to 4.7	2	1.5 to 2.0	10	2.0 min	0.45	1	470	USC
	1SV280												ESC
	JDV2S40FS*	15	3	15	3.96 to 4.66	2	1.57 to 1.97	10	2.4 typ.	0.44	1	470	fSC
	JDV2S07FS	10	3	10	4.0 to 4.9	1	1.85 to 2.35	4	2.0 min	0.42	1	470	fSC
UHF Wideband VCO	1SV304	10	3	10	17.3 to 19.3	1	5.3 to 6.6	4	3 typ.	0.27	1	470	USC
	1SV305												ESC
	JDV4P08U												USQ
	JDV2S08FS												fSC
	1SV310	10	3	10	9.7 to 11.1	1	4.45 to 5.45	4	1.8 min	0.28	1	470	USC
	1SV311												ESC
	JDV2S09FS												fSC
	1SV314	10	3	10	7.3 to 8.4	0.5	2.75 to 3.4	2.5	2.4 min	0.35	1	470	ESC
JDV2S10FS	fSC												
UHF VCO	1SV285	10	3	10	4.0 to 4.9	1	1.85 to 2.35	4	2.3 typ.	0.42	1	470	ESC
	1SV329	10	3	10	5.7 to 6.7	1	1.85 to 2.45	4	2.8 typ.	0.55	1	470	ESC
	JDV2S13FS												fSC
	JDV2S01E	10	3	10	2.85 to 3.45	1	1.35 to 1.81	4	1.8 min	0.5	1	470	ESC
	JDV2S05E	10	3	10	3.85 to 4.55	1	1.94 to 2.48	4	1.7 min	0.3	1	470	ESC
	JDV2S05FS												fSC
	JDV2S25FS	10	1	5	5.62 to 5.99	1	1.91 to 2.12	4	2.77 to 2.98	0.49	1	470	fSC
	JDV2S25SC				5.57 to 5.93		1.88 to 2.08		2.81 to 3				0.47
	JDV2S26FS	10	1	5	15.35 to 16.31	1	5.27 to 5.6	4	2.82 to 3	0.4	1	470	fSC
	JDV2S26SC				15.33 to 16.29		5.25 to 5.58		2.83 to 3.01				0.36
	JDV2S29FS	10	1	6	3.59 to 3.87	1	1.26 to 1.40	4	2.73 to 2.91	0.66	1	470	fSC
	JDV2S29SC				3.54 to 3.83		1.22 to 1.37		2.73 to 2.92				0.64
	JDV2S31SC	10	1	5	9.88 to 10.72	1	4.32 to 4.88	4	2.15 to 2.33	0.23	1	470	SC2
	JDV2S31CT				9.93 to 10.77		4.37 to 4.93		2.13 to 2.31				0.23
JDV2S38SC	10	1	5	7 to 7.74	0.5	2.76 to 3.12	2.5	2.38 to 2.64	0.48	1	470	SC2	
VCXO	1SV322	10	3	10	26 to 30	1	6 to 7.1	4	4 min	0.4	4	100	USC
	1SV323												ESC
	1SV324	10	3	10	43 to 49.5	1	8.5 to 12.2	4	4 min	0.4	4	100	USC
	1SV325												ESC
	JDV2S36E	10	3	10	44 to 49.5	1	5.4 to 7.3	6	7.5	0.4	4	100	ESC
	1SV331				18		5.1		4				3.5 typ.

* New product

2. Product Lines

■ Varicap Diodes for AM/FM Tuners Electrical Characteristics

Application	Part Number	V _R (V)	I _R (nA)	C _T (1)		C _T (2)		r _s (Ω) typ.			Package	
				V _R (V)	V _R (V)	V _R (V)	V _R (V)	min (-)	V _R (V)	f (MHz)		
FM Tuning (Twin)	1SV228	15	10	15	28.5 to 32.5*	3	11.7 to 13.7*	8	0.3*	3	100	S-Mini
	1SV225	32	50	30	18.5 to 21*	3	6.6 to 7.7*	30	0.35*	3	100	S-Mini
	JDV3C34	12	10	10	67.9 to 72.1	2	26.1 to 27.8	6	0.2	2	100	S-Mini

* capacitance between anode 1 and anode 2

■ Varicap Diodes for TV Tuners Electrical Characteristics

Application	Part Number	V _R (V)	I _R (nA)	V _R (V)	C _T (1)		C _T (2)		C _T (1)/C _T (2)	r _s (typ.)			Package
					(pF)	V _R (V)	(pF)	V _R (V)		(Ω)	V _R (V)	f (MHz)	
VHF Tuning (CATV)	1SV215* ¹	30	10	28	26 to 32	2	2.5 to 3.2	25	5.9 min	0.6	5	470	USC
	1SV231* ¹	30	10	28	41 to 49.5	2	2.7 to 3.4	25	14 min	1.05	5	470	USC
	1SV232	30	10	28	28 to 32	2	2.75 to 3.1	25	10 min	0.55	5	470	USC
	1SV262	34	10	32	33 to 38	2	2.6 to 3.0	25	12 min	0.6	5	470	USC
	1SV282* ¹												ESC
	1SV269* ¹	34	10	32	29 to 34	2	2.5 to 2.9	25	10.8 min	0.55	5	470	USC
	1SV283B* ¹						2.5 to 3.0		10.6 min				ESC
VHF/UHF Tuning	1SV214* ¹	30	10	28	14.16 to 16.25	1	2.11 to 2.43	25	9.5 to 7.15	0.4	5	470	USC
	1SV278B* ¹					2	2.01 to 2.43		5.9 to 7.28				ESC
UHF Tuning (BS 2nd C/V) (CATV)	1SV245	30	10	28	3.31 to 4.55	2	0.61 to 0.77	25	5.0 min	1.2	1	470	USC
	1SV309												ESC
	JDV2S71U	30	10	28	6 to 7.2	1	0.49 to 0.64	25	11.5 typ.	1	5	470	USC
	JDV2S71E												ESC
CATV Conv. OSC	1SV286* ¹	30	10	28	14.5 to 16.1	2	1.56 to 1.86	20	7.1 min	0.75	5	470	ESC
Wideband Tuning (CATV)	1SV288	30	10	28	41 to 49.5	2	2.5 to 3.2	25	16 typ.	0.92	5	470	USC
	1SV290B* ¹												ESC

* New product *¹ Manufactured at an overseas factory

■ Diodes for TV Band Switches Electrical Characteristics

	Part Number	V _R (V)	I _R (μA)	V _R (V)	V _F (max)		C _T (typ.)		r _s (typ.)			Package
					(V)	I _F (mA)	(pF)	V _R (V)	(Ω)	I _F (mA)	f (MHz)	
Single	1SS314*	30	0.1	15	0.85	2	0.7	6	0.5	2	100	USC
	1SS381											ESC
Dual	1SS268	30	0.1	15	0.85	2	0.8	6	0.6	2	100	S-Mini
	1SS312*											USM
	1SS364											SSM
	1SS269	30	0.1	15	0.85	2	0.8	6	0.6	2	100	S-Mini
	1SS313											USM

* Manufactured at an overseas factory

■ PIN Diodes

Electrical Characteristics

	Part Number	V _R (V)	I _R		V _F (max)		C _T (typ.)		r _s (typ.)			Package
			(μA)	V _R (V)	(V)	I _F (mA)	(pF)	V _R (V)	(Ω)	I _F (mA)	f (MHz)	
Single	1SV128	50	0.1	50	0.95 (typ.)	50	0.25	50	7	10	100	S-Mini
	1SV271				1				3			USC
	JDP2S04E				ESC							
	JDP2S10U*	50	0.1	50	1	10	0.68	1	2.1	10	100	USC
	1SV307	30	0.1	30	1	50	0.3	1	1	10	100	USC
	1SV308											ESC
	JDP2S02AFS											fSC
	JDP2S02ACT											CST2
	JDP2S08SC	30	0.1	30	0.95	50	0.21	1	1	10	100	SC2
	JDP2S05FS	20	0.1	20	0.94	50	0.32	1	1.5	1	100	fSC
JDP2S05CT	CST2											
JDP2S05SC	SC2											
2-in-1	1SV237	50	0.1	50	0.95 (typ.)	5	0.25	50	3	10	100	SMQ
	1SV172				4				S-Mini			
	1SV252				0.98				3.5			USM
	1SV312				1				0.25			3
	JDP3C04TU	50	0.1	50	1	50	0.3	1	3	10	100	UFM
	JDP3C02AU*	30	0.1	30	1	50	0.3	1	1	10	100	USM
	JDP4P02AT											TESQ
	JDP4P08CTC*	30	0.1	30	0.95	50	0.21	1	1	10	100	CST4C
JDP4L08CTC*												
4-in-1	JDP8P08SC*	30	0.1	30	0.95	50	0.21	1	1	10	100	SC8
	JDP8PA08SC*											
	JDP8PB08SC*											
6-in-1	JDP12L11SC*	20	0.1	20	0.94	50	0.32	1	1.5	1	100	SC12
		30	0.1	30	0.95	50	0.21	1	1	10	100	
	JDP12LA11SC*	20	0.1	20	0.94	50	0.32	1	1.5	1	100	SC12
		30	0.1	30	0.95	50	0.21	1	1	10	100	

* New product

■ SBDs for VHF/UHF Mixers

Electrical Characteristics

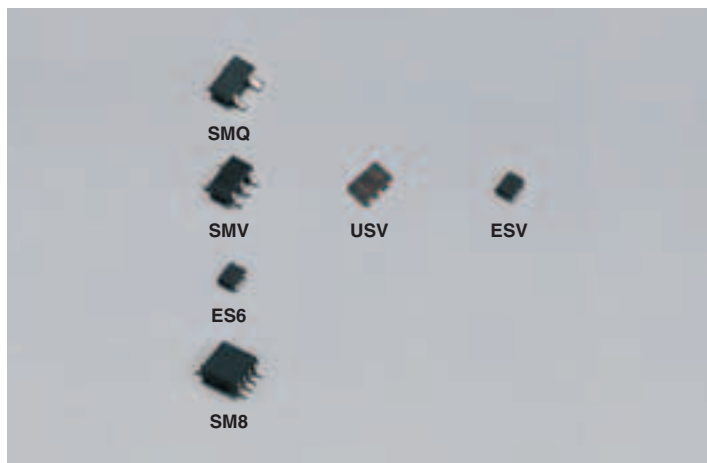
	Part Number	V _R (V _{RM}) (V)	I _F (mA)	V _F (typ.)		C _T (typ.)		Package
				(V)	I _F (mA)	(pF)	V _R (V)	
Single	1SS154	6	30	0.5	10	0.8	0	S-Mini
	1SS315	(5)	30	0.25	2	0.6	0.2	USC
	JDH2S01FS	4	25	0.25	2	0.6	0.2	fSC
	JDH2S02FS	10	10	0.24	1	0.3	0.2	fSC
	JDH2S02SC							SC2
JDH2S04FS*	10	10	0.18	1	0.28	1	fSC	
Dual	1SS271	6	30	0.5	10	0.8	0	S-Mini
	1SS295	4	30	0.25	2	0.6	0.2	S-Mini
	JDH3D01S	4	25	0.25	2	0.6	0.2	SSM
	JDH3D01FV							VESM

* New product

2. Product Lines

2-4 Radio-Frequency Cell Packs (MMIC)

Toshiba's radio-frequency cell packs integrate multiple discrete devices required for mobile communications equipment, such as amplifiers and mixers, reducing product power consumption, size and design complexity.



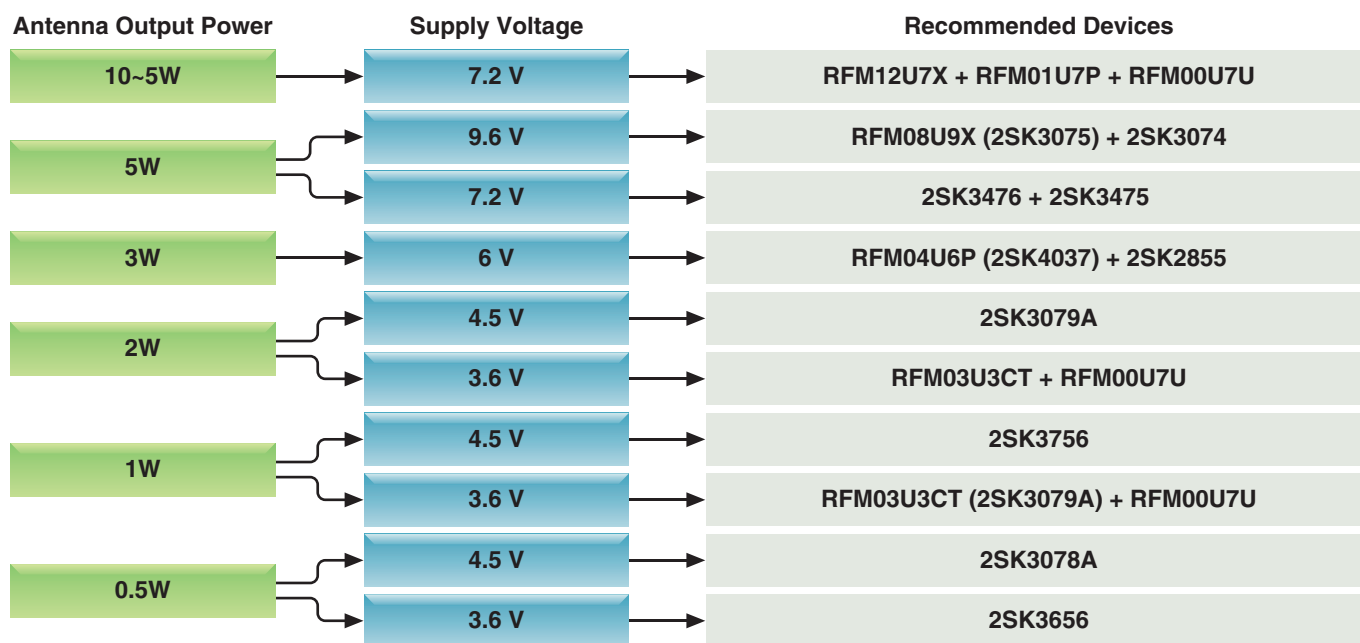
Bipolar Linear ICs

■ Product Lines

Part Number	Package	Function	Application	Electrical Characteristics (Ta = 25°C)
TA4001F	SMQ	Bipolar linear wideband amp	BS tuners, communications equipment, VHF/UHF amps	B/W = 2.4 GHz, Gp = 12.5 dB @ f = 500 MHz, Vcc = 5 V
TA4002F	SMQ	Bipolar linear wideband amp	BS tuners, communications equipment, VHF/UHF amps	B/W = 1.3 GHz, Gp = 23 dB @ f = 500 MHz, Vcc = 5 V
TA4004F	SMV	Bipolar linear wideband amp	Communications equipment, VHF/UHF amps	B/W = 1.2 GHz, Gp = 10.5 dB @ f = 400 MHz, Vcc = 2 V
TA4011AFE	ESV	Bipolar linear wideband amp	Communications equipment, UHF amps	B/W = 2.4 GHz, Po1dB = -6 dBmW @ Vcc = 2 V
TA4011FU	USV	Bipolar linear wideband amp	Communications equipment, UHF amps	B/W = 2.4 GHz, Po1dB = -6 dBmW @ Vcc = 2 V
TA4012AFE	ESV	Bipolar linear wideband amp	Communications equipment, UHF amps	B/W = 2.0 GHz, Po1dB = 0 dBmW @ Vcc = 2 V
TA4012FU	USV	Bipolar linear wideband amp	Communications equipment, UHF amps	B/W = 2.0 GHz, Po1dB = 0 dBmW @ Vcc = 2 V
TA4014FE	ES6	Bipolar linear OSC & buffer	TCXO, VCXO	Icc = 1.2 mA @ Vcc = 3.0 V Vosc = 1.4 p-p (reference value)
TA4015FE	ES6	Bipolar linear OSC & buffer	TCXO, VCXO	Icc = 1.3 mA @ Vcc = 3.0 V Vosc = 1.4 p-p (reference value)
TA4018F	SM8	Bipolar differential gain control amp	CATV, IF variable amps	IS21 ² = 11 dB, GR = 37 dB @ Vcc = 5 V, f = 45 MHz
TA4019F	SM8	Bipolar differential amp	CATV, IF amps	IS21 ² = 30 dB, IM3 = 53 dB @ Vcc = 5 V, f = 45 MHz, Pin = -35 dBmW
TA4107F	SM8	Bipolar linear downconverter	CATV, analog/digital tuners	C.Gain = -0.5 dB, IIP3 = 12 dBmW @ frf = 1 GHz, fLO = 950 MHz, Vcc = 4.5 V

3. Radio-Frequency Power MOSFETs

Selection Guide



Product Lines

Applications	Part Number	Absolute Maximum Ratings (Tc = 25°C)			min	Po(W)			Package
		V _{BSS} (V)	P _D (W)	I _D (A)		Test Conditions			
						V _{DD} (V)	f (MHz)	P _i (W)	
UHF/VHF Professional Radios Amateur Radios	RFM12U7X*	20	20	4	11.5	7.2	520	1.0	PW-X
	RFM08U9X	36	20	5	7.5	9.6	520	0.5	PW-X
	2SK3075	30	20	5	7.5	9.6	520	0.5	PW-X
	2SK3476	20	20	3	7	7.2	520	0.5	PW-X
	2SK2855	10	0.5	1	1.26	6	849	0.2	PW-MINI
	2SK3074	30	3	1	0.63	9.6	520	0.02	PW-MINI
	RFM03U3CT*	16	7	2.5	2.3	3.6	520	0.1	RF-CST3
	2SK3475	20	3	1	0.63	7.2	520	0.02	PW-MINI
	RFM01U7P*	20	3	1	1.0	7.2	520	0.1	PW-MINI
	2SK2854	10	0.5	0.5	0.2	6	849	0.02	PW-MINI
FRS/GMRS	2SK4037	12	20	3	3.55	6	470	0.3	PW-X
	RFM04U6P*	16	7	2	3.5	6.0	470	0.2	PW-MINI
	2SK3079A	10	20	3	2.24	4.5	470	0.1	PW-X
	2SK3756*	7.5	3	1	1.26	4.5	470	0.1	PW-MINI
	2SK3078A	10	3	0.5	0.63	4.5	470	0.1	PW-MINI
	2SK3656	5	3	0.5	0.5	3.6	470	0.02	PW-MINI
Driver	2SK3077	10	0.25	0.1	0.032	4.8	915	0.001	USQ
	RFM00U7U*	20	0.25	0.1	0.1	7.2	520	0.01	USQ

* New product

3. Radio-Frequency Power Devices

■ Packaging

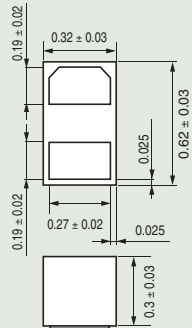


4. Package Dimensions

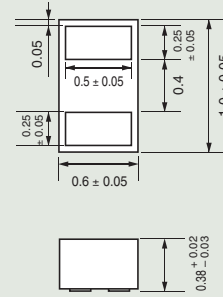
■ 2-Pin Packages

Unit: mm

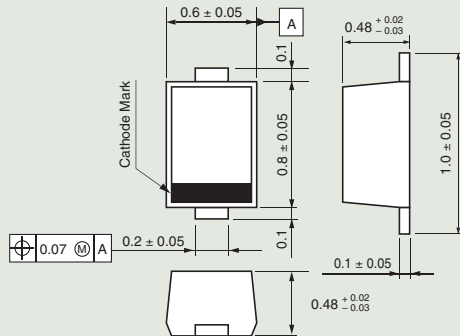
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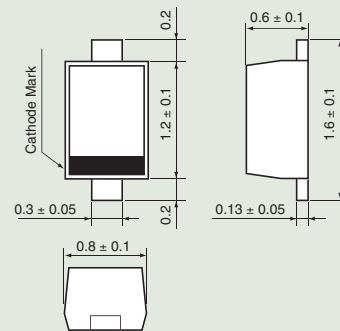
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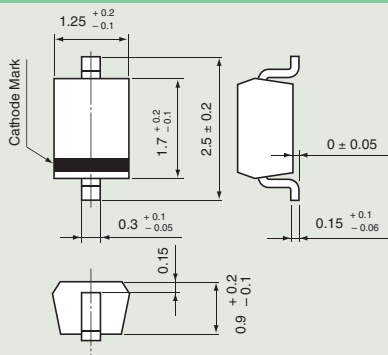
fSC



ESC



USC

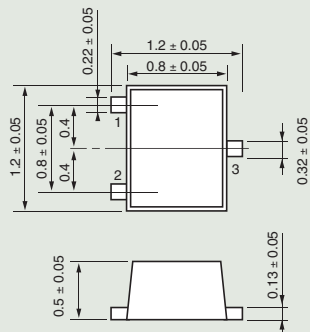


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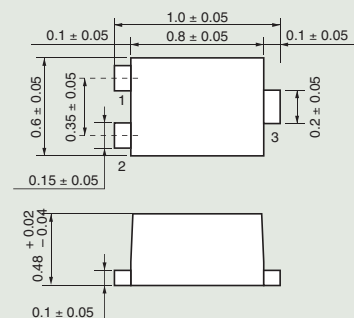
3-Pin Packages

Unit: mm

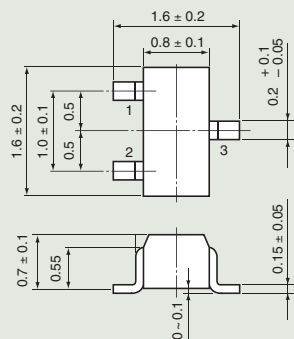
VESM



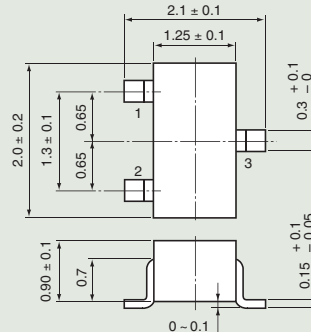
fSM



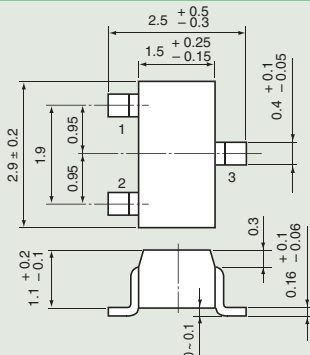
SSM



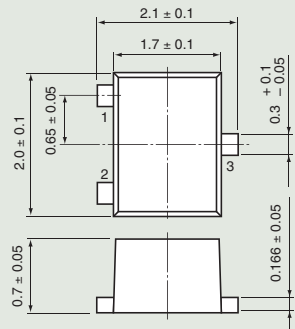
USM



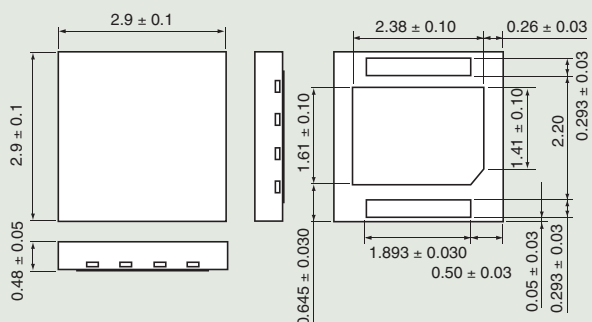
S-Mini



UFM



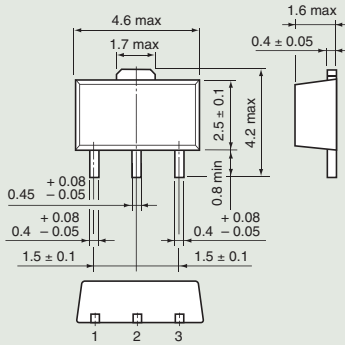
RF-CST3



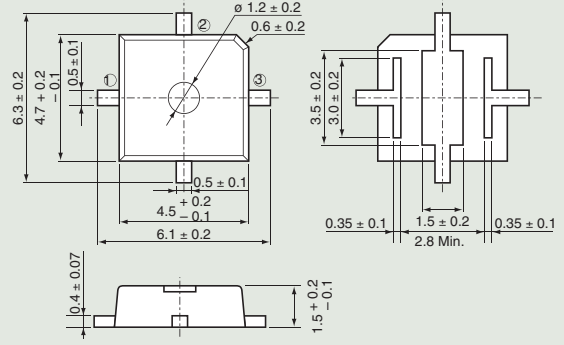
■ 3-, 4- and 5-Pin Packages

Unit: mm

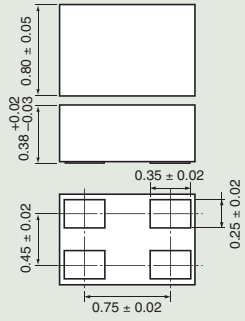
PW-Mini



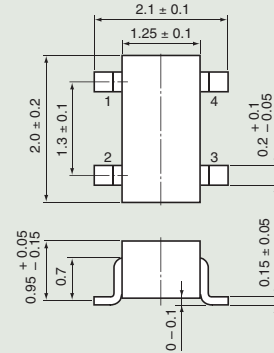
PW-X



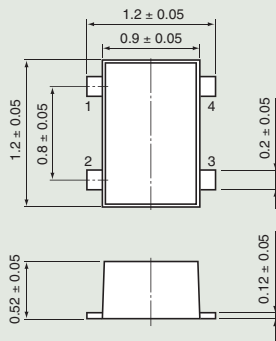
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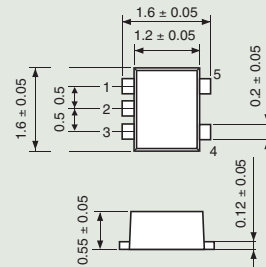
USQ



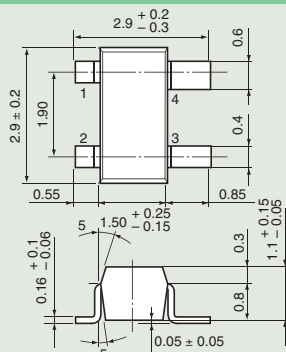
TESQ



ESV



SMQ

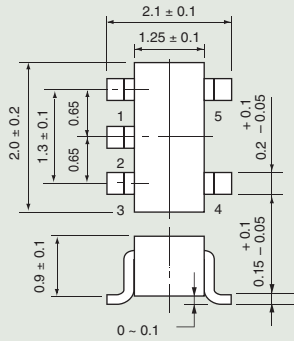


4. Package Dimensions

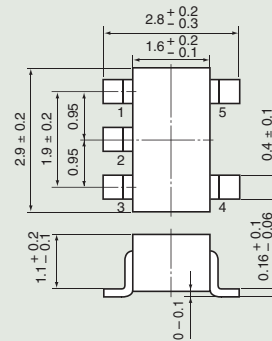
■ 5- and 6-Pin Packages

Unit: mm

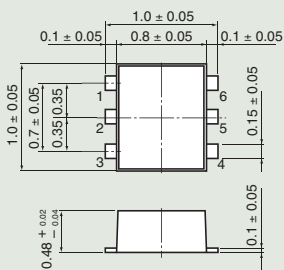
USV



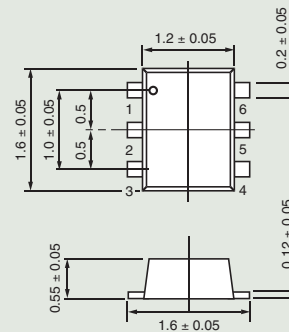
SMV



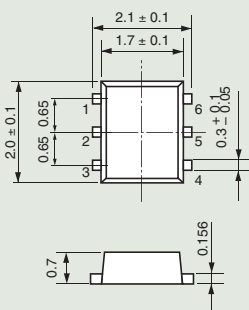
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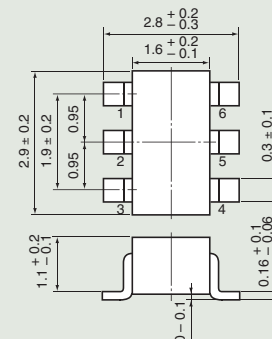
ES6



UF6



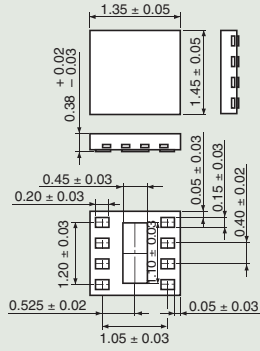
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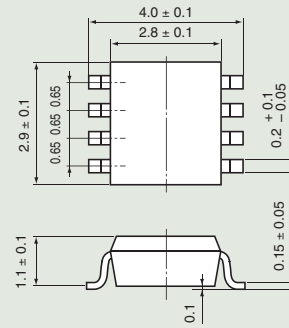
8- and 16-Pin Packages

Unit: mm

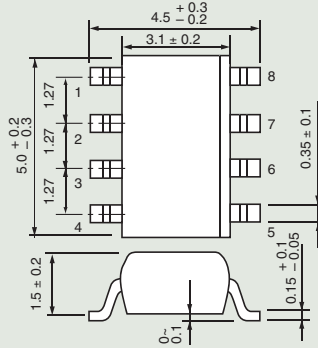
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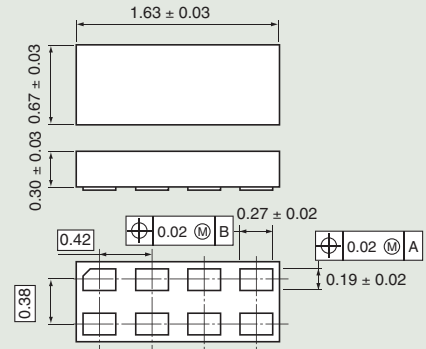
SM8



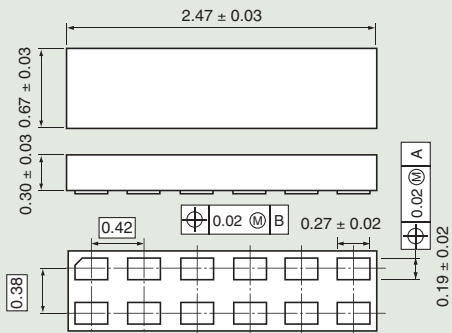
FM8



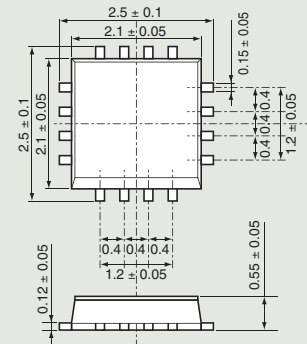
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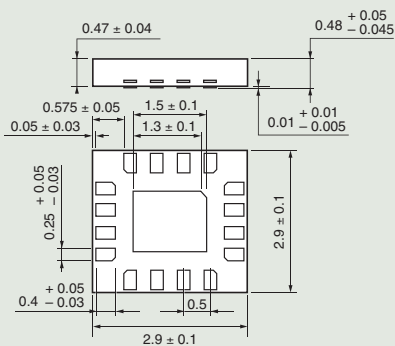
SC12



QS16



CST16



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Previous edition: BCE0003E
2009-9(1k)PC-DQ