NSVF5490SK

RF Transistor for Low Noise Amplifier

20 V, 30 mA, f_T = 8 GHz typ. RF Transistor

This RF transistor is designed for RF amplifier applications. SSFP package is contribute to down size of application because it is small surface mount package. This RF transistor is AEC−Q101 qualified and PPAP capable for automotive applications.

Features

- Low−noise Use: NF = 0.9 dB typ. (f = 1 GHz)
- High Cut−off Frequency: f_T = 8 GHz typ. (V_{CE} = 5 V)
- High Gain: $|S21e|^2$ = 10 dB typ. (f = 1.5 GHz)
- Low−voltage, Low−current Operation (V_{CE} = 1 V, I_C = 1 mA)
  f_T = 3.5 GHz typ.
  $|S21e|^2$ = 5.5 dB typ. (f = 1.5 GHz)
- SSFP Package is Pin−compatible with SOT−623
- AEC−Q101 Qualified and PPAP Capable
- These Devices are Pb−Free, Halogen Free/BFR Free and are RoHS Compliant

Typical Applications

- RF Amplifier for RKE
- RF Amplifier for ADAS
- RF Amplifier for Remote Engine Starter

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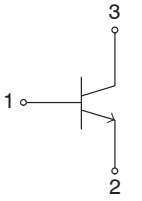
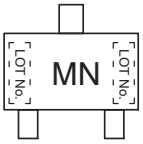
SOT−623 / SSFP
CASE 631AC

ELECTRICAL CONNECTION NPN



1 : Base
2 : Emitter
3 : Collector

MARKING DIAGRAM



MN = Specific Device Code

ORDERING INFORMATION

See detailed ordering and shipping information in the package dimensions section on page 5 of this data sheet.

SPECIFICATIONS

ABSOLUTE MAXIMUM RATINGS at Ta = 25°C

Parameter	Symbol	Value	Unit
Collector to Base Voltage	V_{CBO}	20	V
Collector to Emitter Voltage	V_{CEO}	10	V
Emitter to Base Voltage	V_{EBO}	1.5	V
Collector Current	I_C	30	mA
Collector Dissipation	P_C	100	mW
Operating Junction and Storage Temperature	Tj, Tstg	−55 to +150	°C

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

ELECTRICAL CHARACTERISTICS at Ta = 25°C

Parameter	Symbol	Conditions	Value			Unit
			Min	Typ	Max	
Collector Cutoff Current	I_{CBO}	V_{CB} = 10 V, I_E = 0 A			1.0	μA
Emitter Cutoff Current	I_{EBO}	V_{EB} = 1 V, I_C = 0 A			10	μA
DC Current Gain	h_{FE}	V_{CE} = 5 V, I_C = 10 mA	90		200	
Gain−Bandwidth Product	f_T1	V_{CE} = 5 V, I_C = 10 mA	5	8		GHz
	f_T2	V_{CE} = 1 V, I_C = 1 mA		3.5		GHz
Output Capacitance	Cob	V_{CB} = 10 V, f = 1 MHz		0.45	0.7	pF
Reverse Transfer Capacitance	Cre			0.3		pF
Forward Transfer Gain	$\|S21e\|^2 1$	V_{CE} = 5 V, I_C = 10 mA, f = 1.5 GHz	8	10		dB
	$\|S21e\|^2 2$	V_{CE} = 1 V, I_C = 1 mA, f = 1.5 GHz		5.5		dB
Noise Figure	NF1	V_{CE} = 5 V, I_C = 5 mA, f = 1.5 GHz		1.4	3.0	dB
	NF2	V_{CE} = 2 V, I_C = 3 mA, f = 1 GHz		0.9		dB

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

1. Pay attention to handling since it is liable to be affected by static electricity due to the high−frequency process adopted.

TYPICAL CHARACTERISTICS

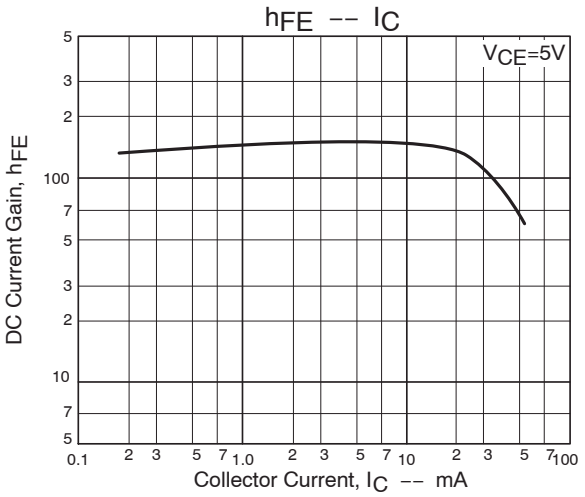


Figure 1.

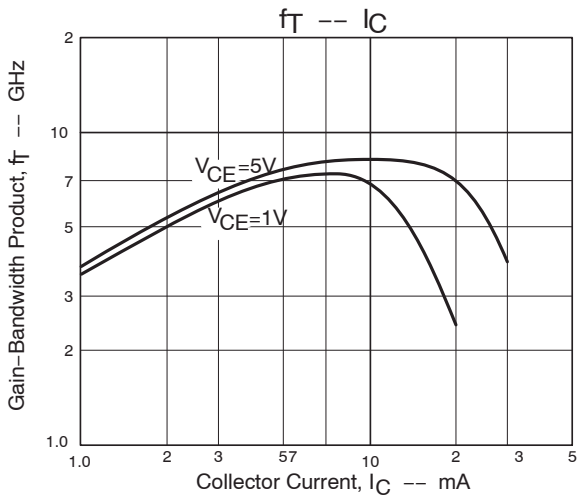
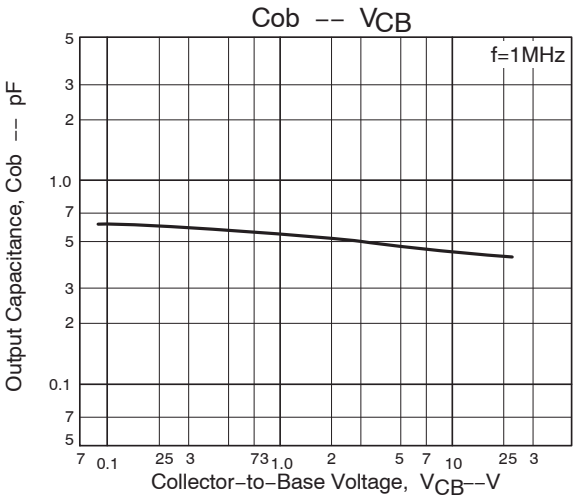


Figure 2.



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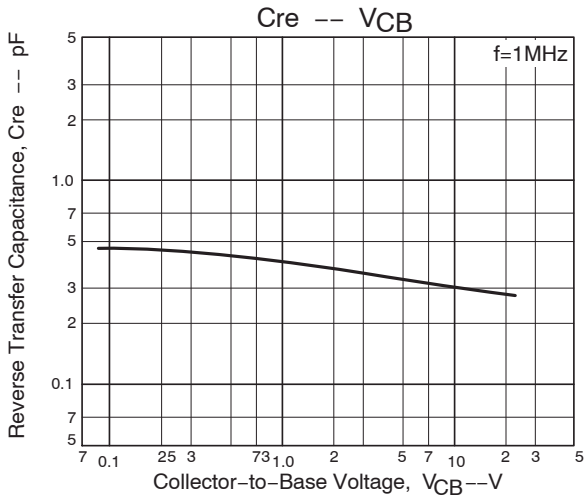


Figure 4.

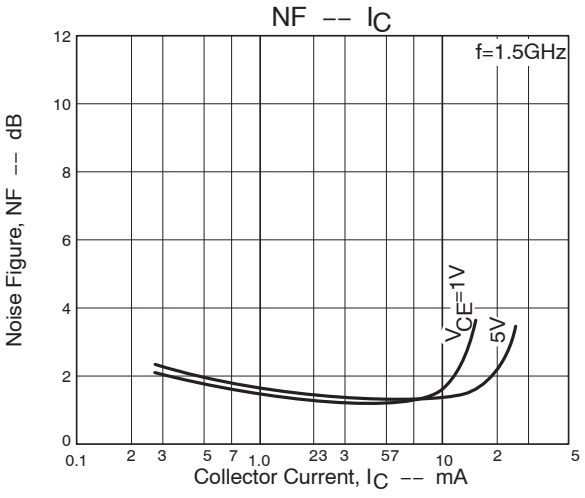


Figure 5.

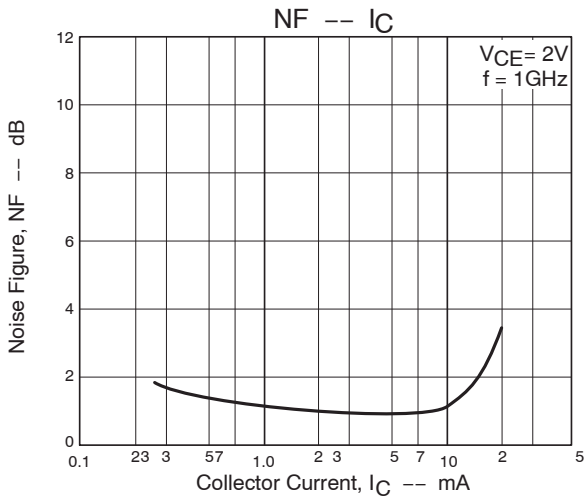
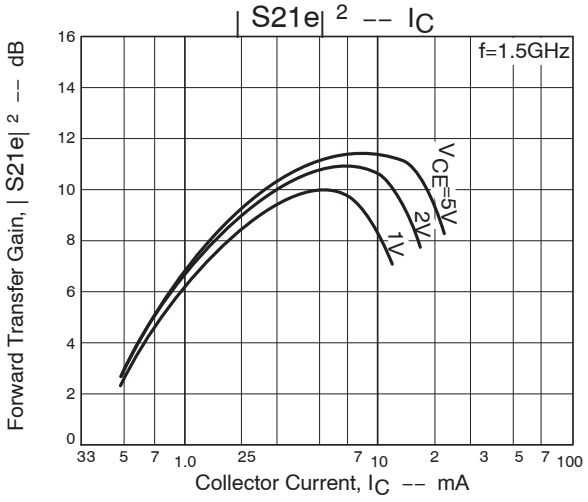


Figure 6.

TYPICAL CHARACTERISTICS



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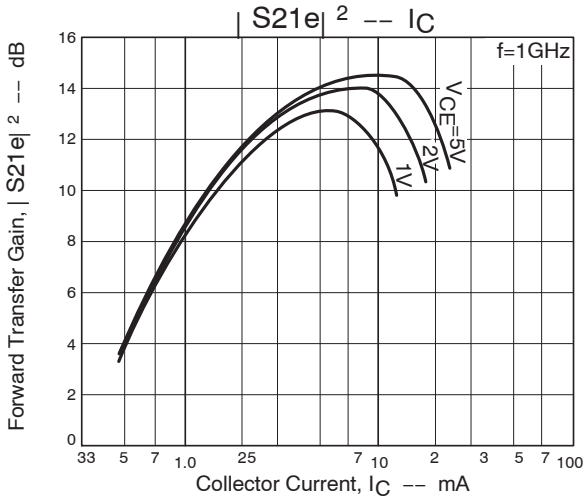

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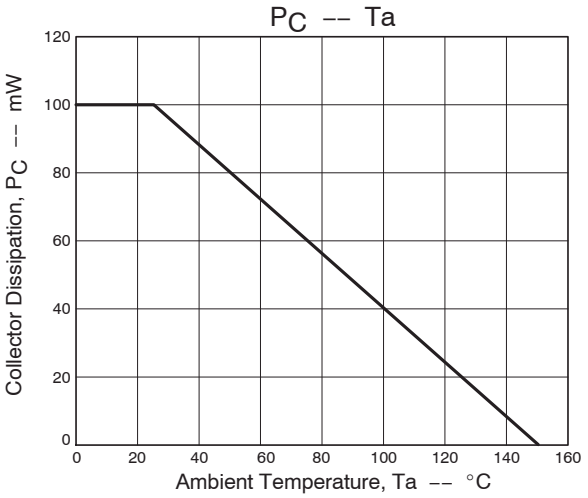

Figure 9.

S PARAMETERS (COMMON EMITTER)

Freq (MHz)	|S11|	∠S11	|S21|	∠S21	|S12|	∠S12	|S22|	∠S22
V_{CE} = 5 V, I_C = 5 mA, Z_O = 50 Ω								
200	0.782	−37.1	12.043	148.4	0.038	69.7	0.889	−19.5
400	0.623	−65.4	9.431	126.6	0.057	60.8	0.758	−28.3
600	0.502	−85.6	7.415	112.2	0.072	56.5	0.646	−33.3
800	0.420	−102.4	6.000	101.5	0.083	55.2	0.577	−35.9
1000	0.369	−114.7	5.025	93.6	0.094	55.1	0.538	−37.6
1200	0.339	−127.2	4.323	86.7	0.105	55.6	0.513	−38.7
1400	0.311	−137.2	3.785	80.6	0.115	55.6	0.490	−39.7
1600	0.296	−144.9	3.391	75.3	0.127	56.7	0.480	−41.3
1800	0.285	−156.5	3.018	70.1	0.139	56.4	0.466	−43.5
2000	0.277	−164.2	2.767	65.7	0.150	56.7	0.460	−45.5

S PARAMETERS (COMMON EMITTER)

Freq (MHz)	|S11|	∠S11	|S21|	∠S21	|S12|	∠S12	|S22|	∠S22
V_{CE} = 5 V, I_C = 10 mA, Z_O = 50 Ω								
200	0.641	−52.7	16.527	137.8	0.031	67.4	0.820	−22.9
400	0.468	−85.4	11.299	115.7	0.048	60.5	0.643	−30.2
600	0.377	−106.6	8.303	103.1	0.060	60.0	0.549	−32.2
800	0.321	−124.1	6.502	94.0	0.072	60.9	0.499	−33.2
1000	0.293	−136.1	5.342	87.4	0.084	61.9	0.477	−33.9
1200	0.280	−146.7	4.546	81.4	0.097	62.7	0.462	−35.0
1400	0.266	−156.6	3.947	76.4	0.108	63.0	0.449	−36.2
1600	0.263	−163.2	3.527	71.4	0.123	63.7	0.444	−37.8
1800	0.263	−173.5	3.121	67.0	0.136	62.8	0.435	−39.9
2000	0.264	−179.8	2.864	62.8	0.150	62.4	0.434	−42.4
V_{CE} = 2 V, I_C = 3 mA, Z_O = 50 Ω								
200	0.851	−30.4	8.644	154.1	0.042	73.0	0.937	−16.4
400	0.724	−55.7	7.310	133.8	0.073	61.3	0.820	−27.9
600	0.612	−76.1	6.083	118.6	0.093	54.2	0.709	−35.7
800	0.521	−93.0	5.085	106.9	0.107	50.4	0.628	−40.4
1000	0.461	−106.1	4.343	98.1	0.118	48.3	0.572	−43.7
1200	0.423	−118.6	3.806	90.0	0.128	47.5	0.536	−45.8
1400	0.382	−129.4	3.349	83.3	0.137	46.9	0.506	−47.3
1600	0.366	−138.0	3.036	77.5	0.147	47.4	0.485	−49.5
1800	0.341	−148.8	2.685	71.7	0.157	47.2	0.463	−51.9
2000	0.333	−157.7	2.479	66.7	0.167	47.6	0.453	−54.1
V_{CE} = 1 V, I_C = 1 mA, Z_O = 50 Ω								
200	0.945	−18.7	3.431	162.9	0.053	78.1	0.982	−10.3
400	0.892	−36.9	3.263	147.1	0.099	66.9	0.939	−19.7
600	0.826	−52.9	3.004	133.2	0.136	57.5	0.879	−27.7
800	0.754	−67.9	2.765	120.4	0.164	49.7	0.815	−34.8
1000	0.691	−81.1	2.539	109.9	0.184	43.4	0.758	−40.0
1200	0.639	−94.3	2.366	99.8	0.199	38.4	0.727	−44.3
1400	0.589	−104.9	2.143	91.2	0.207	34.1	0.683	−47.8
1600	0.558	−114.1	1.969	83.6	0.213	31.7	0.653	−51.4
1800	0.522	−124.4	1.797	76.2	0.218	28.7	0.621	−54.9
2000	0.490	−134.9	1.701	69.7	0.219	27.0	0.601	−58.1

ORDERING INFORMATION

Device	Marking	Package	Shipping†
NSVF5490SKT3G	MN	SOT−623 / SSFP (Pb−Free / Halogen Free)	8,000 / Tape & Reel

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D

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ISSUE O

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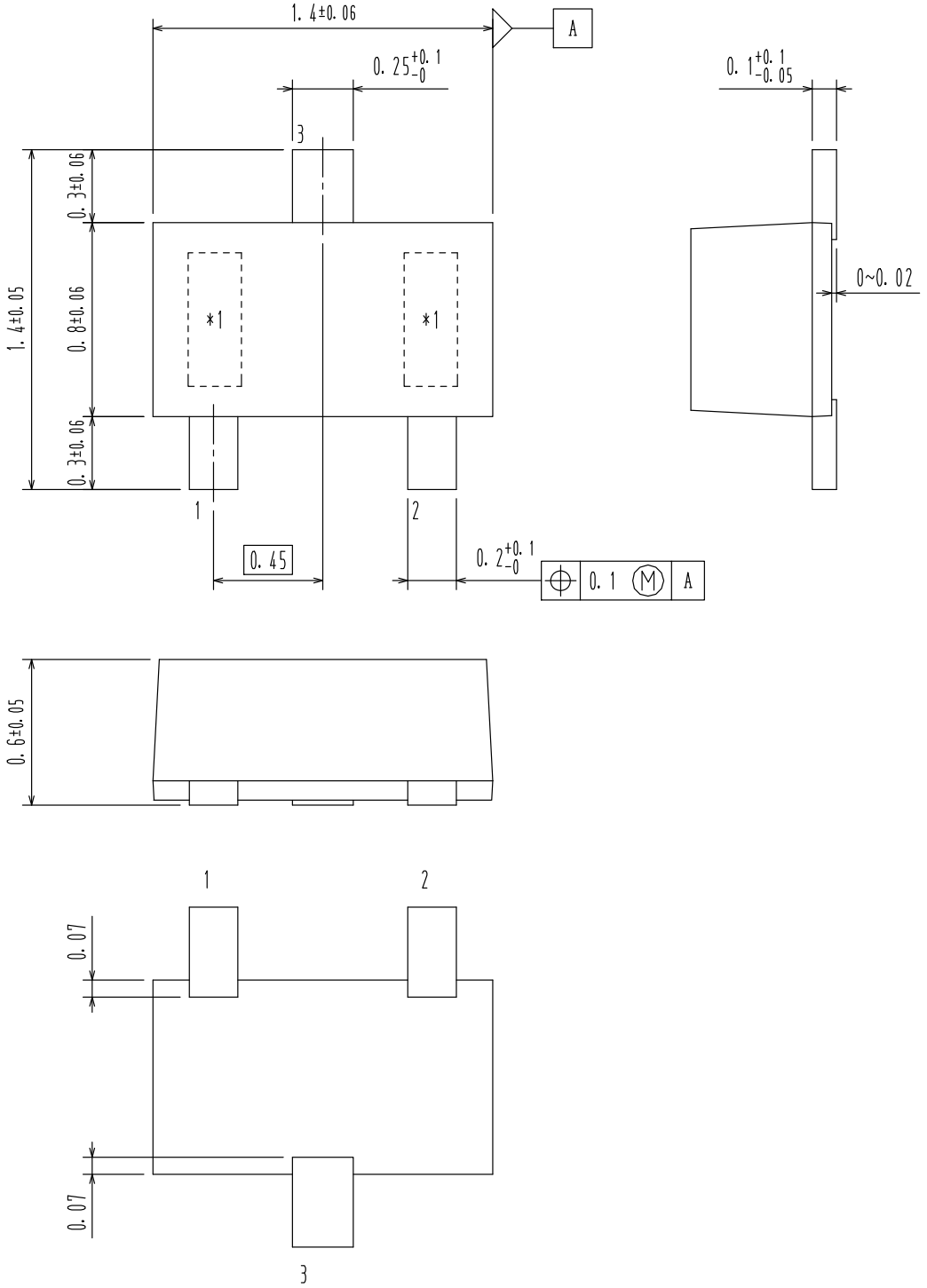

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