RF Transistor for Low Noise Amplifier

10 V, 70 mA, f_T = 7 GHz typ.

NSVF5488SK

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: NF = 1.0 dB typ. (f = 1 GHz)
- High Gain: $|S21e|^2$ = 12 dB typ. (f = 1 GHz)
- High Cut−off Frequency: f_T = 7 GHz typ.
- 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
- RF Amplifier for UHF Application

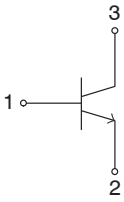
SPECIFICATIONS ABSOLUTE MAXIMUM RATINGS at T_A = 25°C

Symbol	Parameter	Value	Unit
V_{CBO}	Collector to Base Voltage	20	V
V_{CEO}	Collector to Emitter Voltage	10	V
V_{EBO}	Emitter to Base Voltage	2	V
I_C	Collector Current	70	mA
P_C	Collector Dissipation	100	mW
Tj, Tstg	Operating Junction and Storage Temperature	−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.

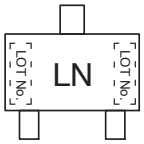
SOT−623 / SSFP
CASE 631AC

ELECTRICAL CONNECTION NPN



1 : Base
2 : Emitter
3 : Collector

MARKING DIAGRAM



LN = Specific Device Code

ORDERING INFORMATION

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

ELECTRICAL CHARACTERISTICS at T_A = 25°C

Symbol	Parameter	Conditions	Value			Unit
			Min	Typ	Max	
I_{CBO}	Collector Cutoff Current	V_{CB} = 10 V, I_E = 0 A			1.0	μA
I_{EBO}	Emitter Cutoff Current	V_{EB} = 1 V, I_C = 0 A			10	μA
h_{FE}	DC Current Gain	V_{CE} = 5 V, I_C = 20 mA	90		200	
f_T	Gain−Bandwidth Product	V_{CE} = 5 V, I_C = 20 mA	5	7		GHz
Cob	Output Capacitance	V_{CB} = 10 V, f = 1 MHz		0.7	1.2	pF
Cre	Reverse Transfer Capacitance			0.45		pF
$|S21e|^2$1	Forward Transfer Gain	V_{CE} = 5 V, I_C = 20 mA, f = 1 GHz	9	12		dB
$|S21e|^2$2		V_{CE} = 2 V, I_C = 3 mA, f = 1 GHz		8.5		dB
NF	Noise Figure	V_{CE} = 5 V, I_C = 7 mA, f = 1 GHz		1.0	1.8	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

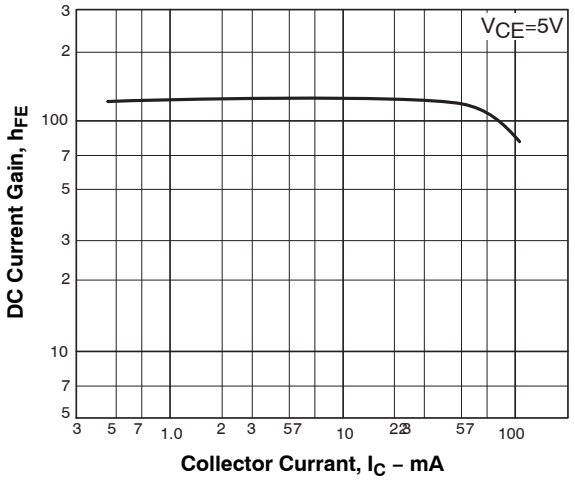


Figure 1. h_{FE} – I_C

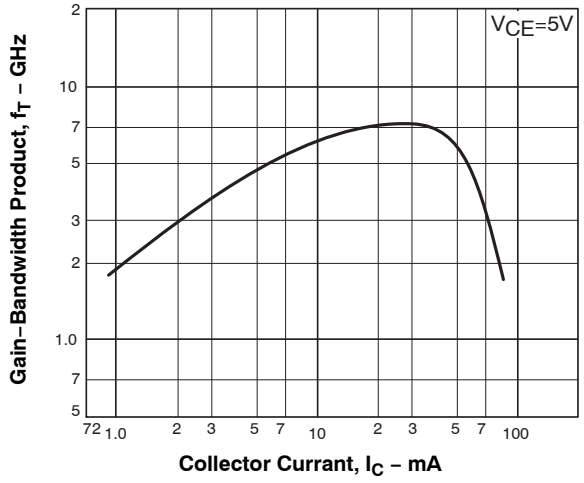


Figure 2. f_T – I_C

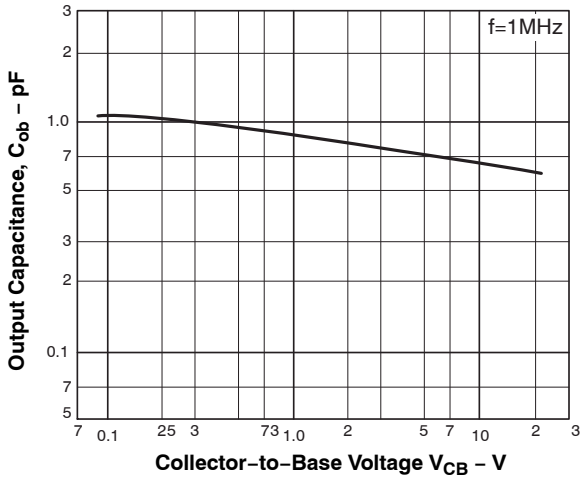


Figure 3. C_{ob} – V_{CB}

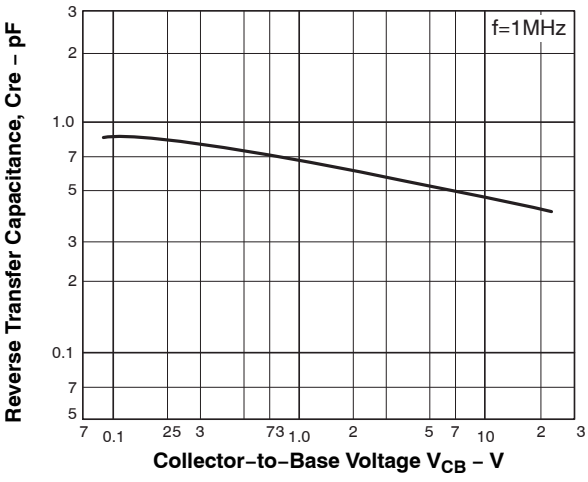


Figure 4. Cre – V_{CB}

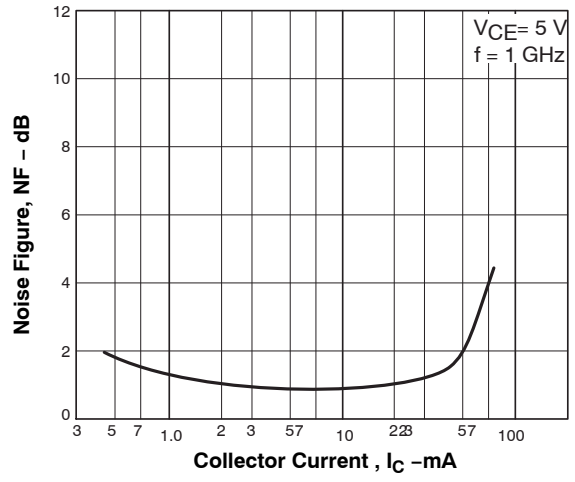


Figure 5. NF – I_C

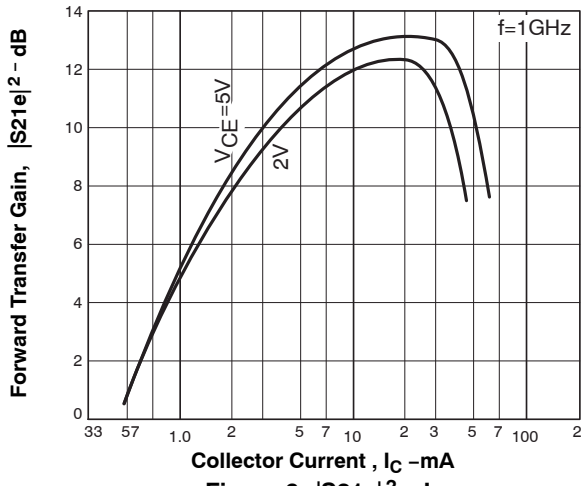


Figure 6. $|S21e|^2$ – I_C

TYPICAL CHARACTERISTICS (continued)

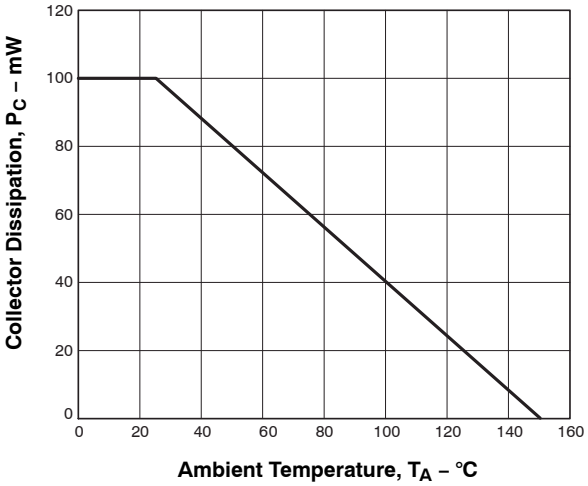


Figure 7. P_C – T_A

S PARAMETERS (COMMON EMITTER)

Freq (MHz)	|S11|	∠S11	|S21|	∠S21	|S12|	∠S12	|S22|	∠S22
V_{CE} = 5 V, I_C = 7 mA, Z_O = 50 Ω								
100	0.786	−40.7	17.507	151.3	0.028	70.1	0.898	−20.4
200	0.677	−72.4	13.998	131.4	0.046	58.0	0.739	−33.4
400	0.546	−112.7	9.061	108.6	0.064	49.6	0.525	−43.7
600	0.492	−135.2	6.442	96.1	0.076	49.3	0.423	−46.7
800	0.473	−150.0	5.005	87.3	0.087	50.8	0.374	−44.4
1000	0.465	−160.0	4.073	80.4	0.099	52.6	0.346	−49.7
1200	0.457	−169.5	3.449	74.0	0.111	54.0	0.332	−51.6
1400	0.451	−176.2	2.989	68.6	0.124	55.2	0.321	−54.1
1600	0.449	177.8	2.658	63.8	0.138	56.6	0.319	−56.2
1800	0.454	172.5	2.378	58.4	0.151	56.7	0.313	−60.0
2000	0.460	167.1	2.154	54.0	0.166	56.7	0.311	−63.2
V_{CE} = 5 V, I_C = 20 mA, Z_O = 50 Ω								
100	0.601	−65.8	28.967	137.1	0.023	64.1	0.757	−32.9
200	0.497	−103.7	19.309	116.6	0.035	57.0	0.534	−50.3
400	0.435	−139.6	10.891	98.6	0.050	58.7	0.345	−50.3
600	0.419	−156.6	7.461	89.3	0.065	61.3	0.280	−50.7
800	0.414	−166.6	5.695	82.5	0.081	63.1	0.251	−51.3
1000	0.413	−174.0	4.613	77.0	0.098	63.8	0.235	−52.9
1200	0.413	178.6	3.870	71.8	0.114	63.9	0.226	−55.1
1400	0.411	173.8	3.345	66.9	0.131	63.6	0.221	−57.7
1600	0.413	169.6	2.960	62.7	0.148	63.2	0.220	−60.2
1800	0.416	165.1	2.655	58.0	0.165	61.8	0.219	−64.8
2000	0.422	160.3	2.406	54.0	0.182	60.6	0.218	−68.3
V_{CE} = 2 V, I_C = 3 mA, Z_O = 50 Ω								
100	0.888	−30.2	9.280	158.6	0.038	73.6	0.949	−15.1
200	0.815	−56.4	8.218	141.3	0.067	60.5	0.849	−26.9
400	0.690	−96.0	6.074	116.7	0.098	45.1	0.657	−41.1
600	0.616	−120.7	4.517	101.4	0.112	38.4	0.539	−47.6
800	0.584	−138.0	3.610	90.4	0.120	35.8	0.475	−51.2
1000	0.566	−150.7	2.995	81.9	0.125	35.7	0.434	−54.5
1200	0.555	−161.2	2.540	74.2	0.131	36.5	0.410	−57.5
1400	0.546	−169.3	2.213	67.5	0.137	38.4	0.393	−60.7
1600	0.541	−176.4	1.982	62.0	0.143	40.7	0.391	−64.0
1800	0.545	177.1	1.774	55.9	0.152	42.5	0.382	−67.8
2000	0.547	170.9	1.614	50.9	0.163	44.7	0.381	−72.1

ORDERING INFORMATION

Device	Marking	Package	Shipping†
NSVF5488SKT3G	LN	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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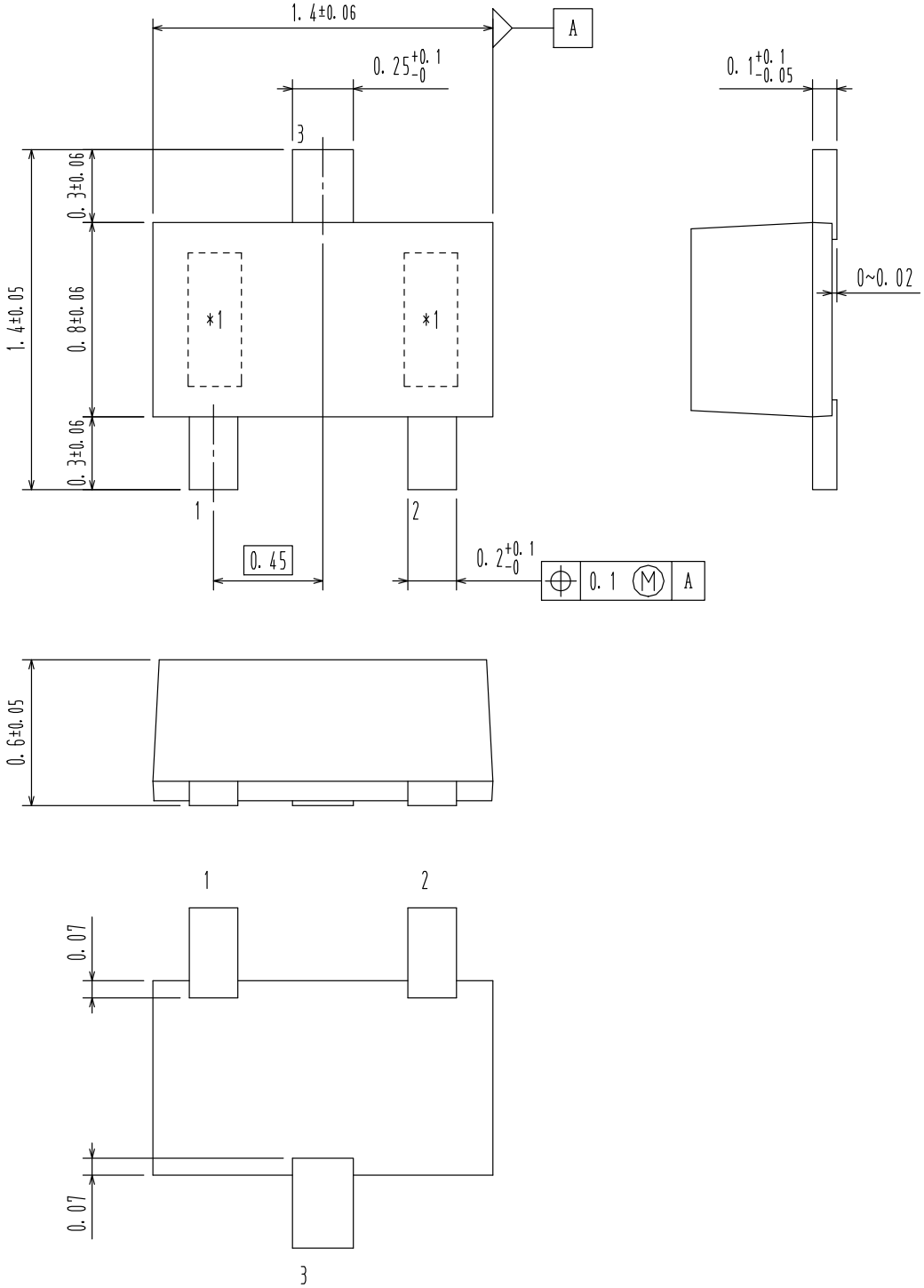
ISSUE O

DATE 29 FEB 2012



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ADDITIONAL INFORMATION

TECHNICAL PUBLICATIONS:
Technical Library: www.onsemi.com/design/resources/technical−documentation
onsemi Website: www.onsemi.com

ONLINE SUPPORT: www.onsemi.com/support
For additional information, please contact your local Sales Representative at
www.onsemi.com/support/sales