NST45011MW6T1G, NSVT45011MW6T3G

Dual Matched General Purpose Transistor

NPN Matched Pair

These transistors are housed in an ultra−small SOT−363 package ideally suited for portable products. They are assembled to create a pair of devices highly matched in all parameters, eliminating the need for costly trimming. Applications are Current Mirrors; Differential, Sense and Balanced Amplifiers; Mixers; Detectors and Limiters.

Features

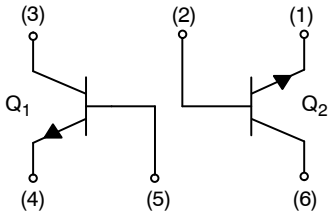
- Current Gain Matching to 10%
- Base−Emitter Voltage Matched to 2 mV
- Drop−In Replacement for Standard Device
- NSV Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC−Q101 Qualified and PPAP Capable
- These Devices are Pb−Free, Halogen Free/BFR Free and are RoHS Compliant*

ON Semiconductor®

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SOT−363
CASE 419B
STYLE 1



MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector − Emitter Voltage	V_{CEO}	45	V
Collector − Base Voltage	V_{CBO}	50	V
Emitter − Base Voltage	V_{EBO}	6.0	V
Collector Current − Continuous	I_C	100	mAdc

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

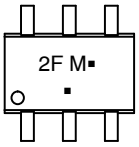
THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Total Device Dissipation Per Device FR−5 Board (Note 1) T_A = 25°C Derate Above 25°C	P_D	380 250 3.0	mW mW/°C
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	328	°C/W
Junction and Storage Temperature Range	T_J, T_{stg}	−55 to +150	°C

1. FR−5 = 1.0 x 0.75 x 0.062 in

*For additional information on our Pb−Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

MARKING DIAGRAMS



2F = Device Code
M = Date Code
▪ = Pb−Free Package

(Note: Microdot may be in either location)

ORDERING INFORMATION

Device	Package	Shipping†
NST45011MW6T1G	SOT−363 (Pb−Free)	3,000 / Tape & Reel
NSVT45011MW6T3G	SOT−363 (Pb−Free)	10,000 / 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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ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS					
Collector – Emitter Breakdown Voltage, (I_C = 10 mA)	$V_{(BR)CEO}$	45	–	–	V
Collector – Emitter Breakdown Voltage, (I_C = 10 μA, V_{EB} = 0)	$V_{(BR)CES}$	50	–	–	V
Collector – Base Breakdown Voltage, (I_C = 10 μA)	$V_{(BR)CBO}$	50	–	–	V
Emitter – Base Breakdown Voltage, (I_E = 1.0 μA)	$V_{(BR)EBO}$	6.0	–	–	V
Collector Cutoff Current (V_{CB} = 30 V) (V_{CB} = 30 V, T_A = 150°C)	I_{CBO}	 – –	 – –	 15 5.0	 nA μA
ON CHARACTERISTICS					
DC Current Gain (I_C = 10 μA, V_{CE} = 5.0 V) (I_C = 2.0 mA, V_{CE} = 5.0 V) (I_C = 2.0 mA, V_{CE} = 5.0 V) (Note 2)	h_{FE} $h_{FE(1)}/h_{FE(2)}$	 150 200 0.9	 – 300 1.0	 – 500 1.1	–
Collector – Emitter Saturation Voltage (I_C = 10 mA, I_B = 0.5 mA) (I_C = 100 mA, I_B = 5.0 mA)	$V_{CE(sat)}$	 – –	 – –	 250 600	mV
Base – Emitter Saturation Voltage (I_C = 10 mA, I_B = 0.5 mA) (I_C = 100 mA, I_B = 5.0 mA)	$V_{BE(sat)}$	 700 850	 750 890	 800 950	mV
Base – Emitter On Voltage (I_C = 2.0 mA, V_{CE} = 5.0 V) (I_C = 10 mA, V_{CE} = 5.0 V) (I_C = 2.0 mA, V_{CE} = 5.0 V) (Note 3)	$V_{BE(on)}$ $V_{BE(1)} - V_{BE(2)}$	 580 – –	 660 – 1.0	 700 770 2.0	mV
SMALL–SIGNAL CHARACTERISTICS					
Current – Gain – Bandwidth Product, (I_C = 10 mA, V_{CE} = 5 Vdc, f = 100 MHz)	f_T	100	–	–	MHz
Output Capacitance, (V_{CB} = 10 V, f = 1.0 MHz)	C_{ob}	–	–	4.5	pF
Noise Figure, (I_C = 0.2 mA, V_{CE} = 5 Vdc, R_S = 2 kΩ, f = 1 kHz, BW = 200Hz)	NF	–	–	10	dB
Noise Figure, (I_C = 0.1 mA, V_{CE} = 10 Vdc, R_S = 1 kΩ, f = 1 kHz, BW = 200Hz)	NF	–	1.0	–	dB

2. $h_{FE(1)}/h_{FE(2)}$ is the ratio of one transistor compared to the other transistor within the same package. The smaller h_{FE} is used as numerator.
3. $V_{BE(1)} - V_{BE(2)}$ is the absolute difference of one transistor compared to the other transistor within the same package.

TYPICAL CHARACTERISTICS

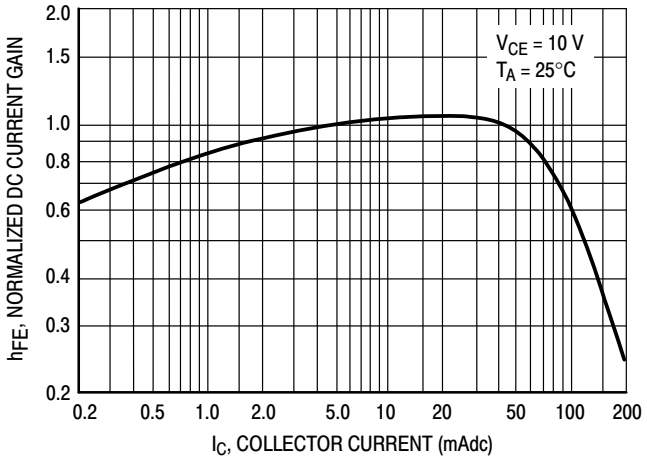


Figure 1. Normalized DC Current Gain

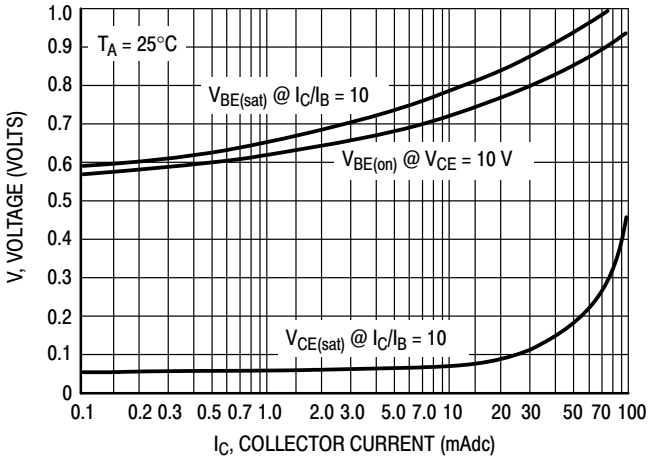


Figure 2. "Saturation" and "On" Voltages

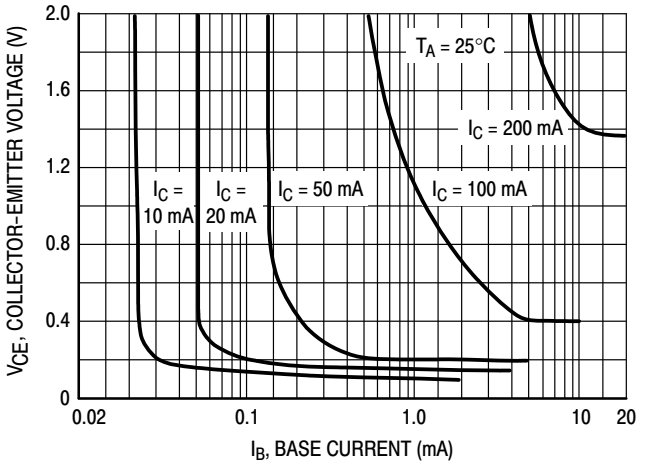


Figure 3. Collector Saturation Region

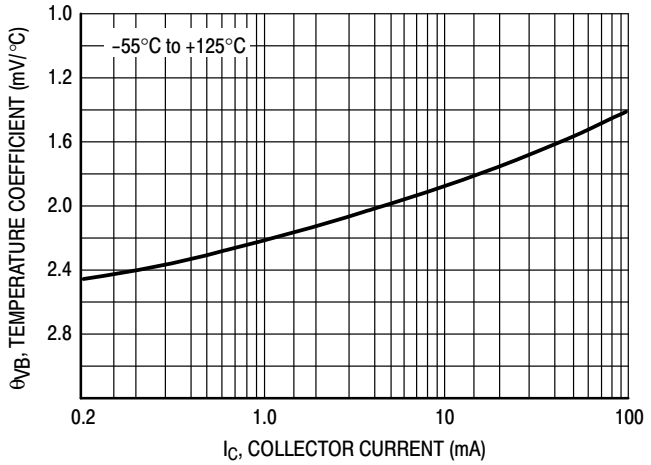


Figure 4. Base−Emitter Temperature Coefficient

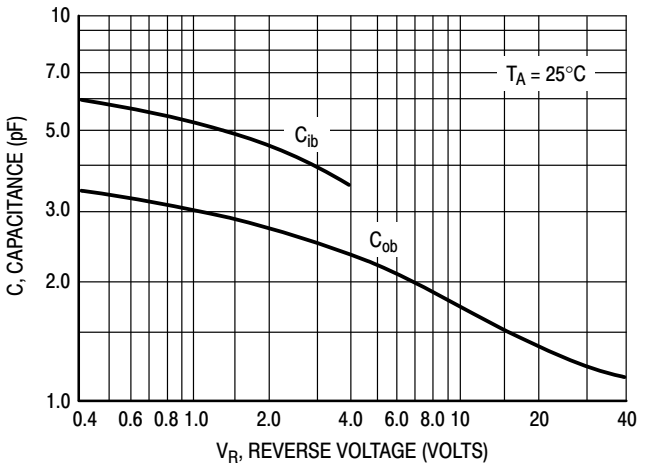


Figure 5. Capacitances

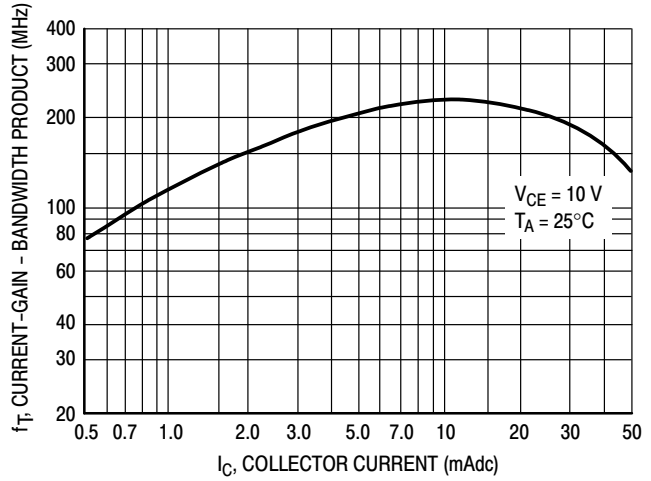


Figure 6. Current−Gain − Bandwidth Product

TYPICAL CHARACTERISTICS

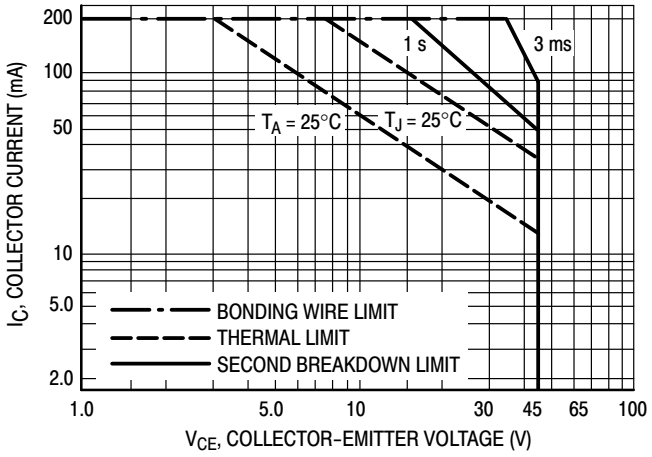


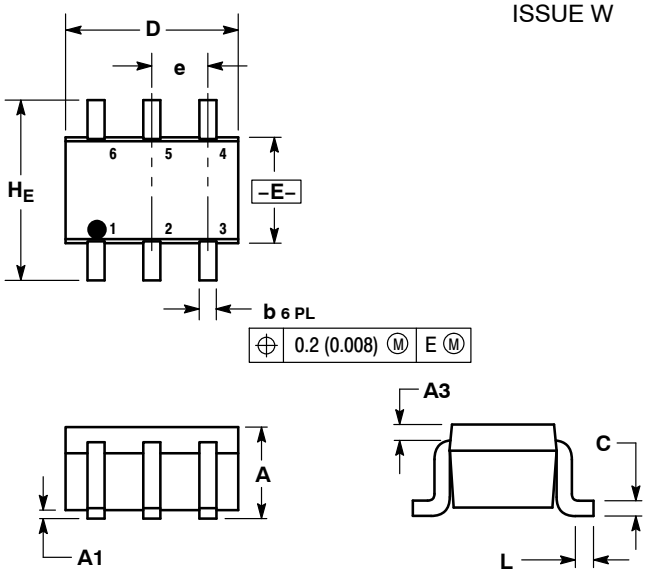
Figure 7. Active Region Safe Operating Area

The safe operating area curves indicate $I_C - V_{CE}$ limits of the transistor that must be observed for reliable operation. Collector load lines for specific circuits must fall below the limits indicated by the applicable curve.

The data of Figure 7 is based upon $T_{J(pk)}$ = 150°C; T_C or T_A is variable depending upon conditions.

PACKAGE DIMENSIONS

SC−88/SC70−6/SOT−363
CASE 419B−02
ISSUE W

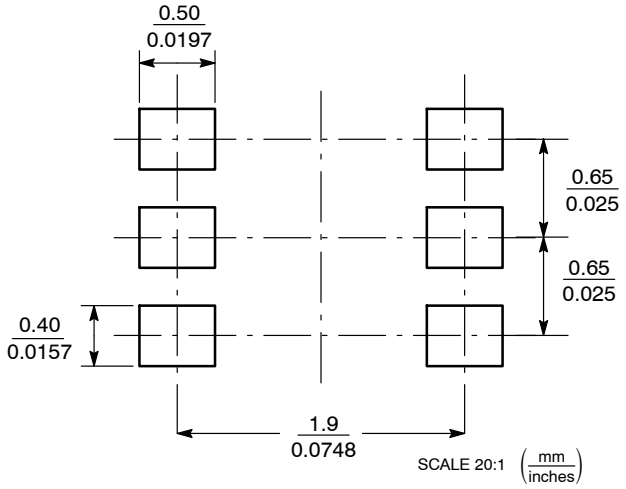


NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. 419B−01 OBSOLETE, NEW STANDARD 419B−02.

	MILLIMETERS			INCHES		
DIM	MIN	NOM	MAX	MIN	NOM	MAX
A	0.80	0.95	1.10	0.031	0.037	0.043
A1	0.00	0.05	0.10	0.000	0.002	0.004
A3	0.20 REF			0.008 REF		
b	0.10	0.21	0.30	0.004	0.008	0.012
C	0.10	0.14	0.25	0.004	0.005	0.010
D	1.80	2.00	2.20	0.070	0.078	0.086
E	1.15	1.25	1.35	0.045	0.049	0.053
e	0.65 BSC			0.026 BSC		
L	0.10	0.20	0.30	0.004	0.008	0.012
H_E	2.00	2.10	2.20	0.078	0.082	0.086

STYLE 1:
PIN 1. EMITTER 2
2. BASE 2
3. COLLECTOR 1
4. EMITTER 1
5. BASE 1
6. COLLECTOR 2

SOLDERING FOOTPRINT*



*For additional information on our Pb−Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

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