

NST65010MMR6

Product Preview

Dual Matched General Purpose Transistor

PNP Matched Pair

These transistors are housed in an SC-74 package. 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

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V_{CEO}	-65	V
Collector-Base Voltage	V_{CBO}	-80	V
Emitter-Base Voltage	V_{EBO}	-5.0	V
Collector Current - Continuous	I_C	-100	mAdc
Collector Current-Peak Single Pulse; $t_p \leq 1$ ms	I_{CM}	-200	mAdc

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.

THERMAL CHARACTERISTICS

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

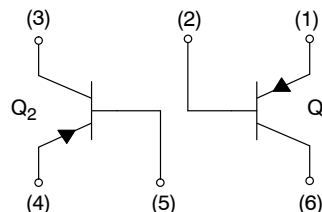
1. FR-5 = 1.0 x 0.75 x 0.062 in.

This document contains information on a product under development. ON Semiconductor reserves the right to change or discontinue this product without notice.



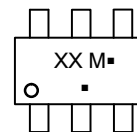
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SC-74
CASE 318F

MARKING DIAGRAMS



- XX = Specific Device Code
- M = Date Code
- = Pb-Free Package

(Note: Microdot may be in either location)

ORDERING INFORMATION

Device	Package	Shipping†
NST65010MMR6T1G	SC-74 (Pb-Free)	3000 / Tape & Reel
NSVT65010MMR6T1G	SC-74 (Pb-Free)	3000 / 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}	-65	-	-	V
Collector - Emitter Breakdown Voltage, (I _C = -10 μA, V _{EB} = 0)	V _{(BR)CES}	-80	-	-	V
Collector - Base Breakdown Voltage, (I _C = -10 μA)	V _{(BR)CBO}	-80	-	-	V
Emitter - Base Breakdown Voltage, (I _E = -1.0 μA)	V _{(BR)EBO}	-5.0	-	-	V
Collector Cutoff Current (V _{CB} = -30 V) (V _{CB} = -30 V, T _A = 150°C)	I _{CBO}	-	-	-15 -4.0	nA μA
Emitter Cutoff Current (V _{EB} = -5 V)	I _{EBO}	-	-	-100	nA

ON CHARACTERISTICS

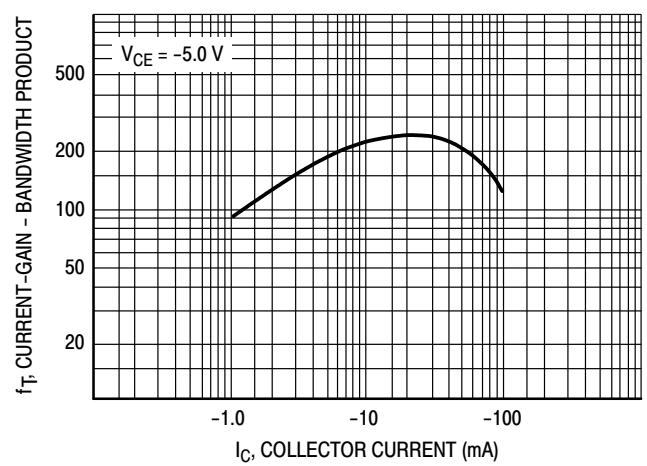
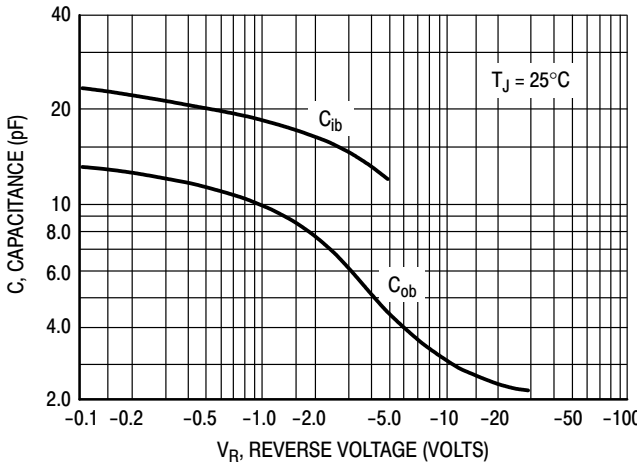
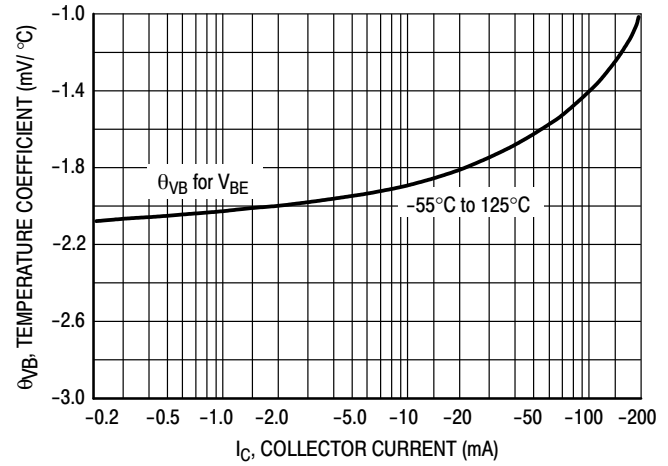
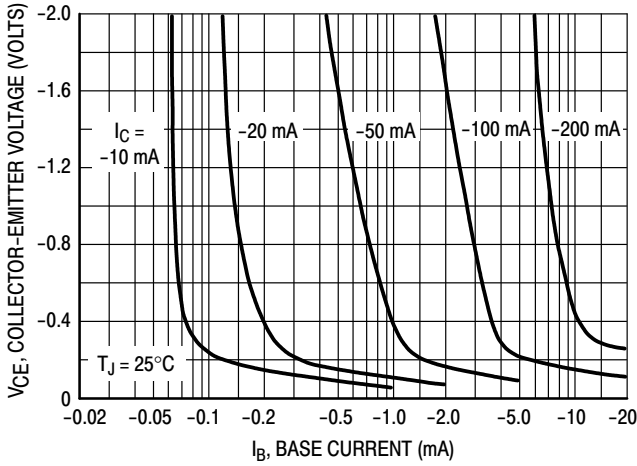
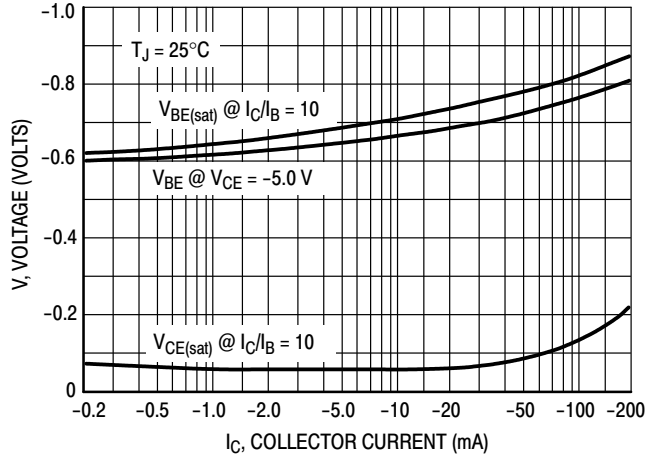
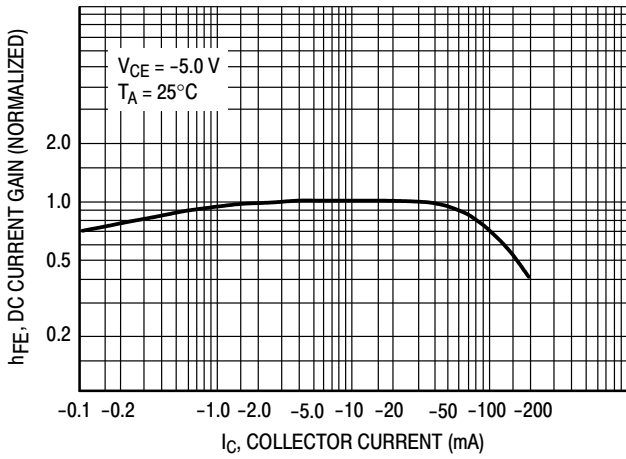
DC Current Gain (I _C = -10 μA, V _{CE} = -5.0 V) (I _C = -2.0 mA, V _{CE} = -5.0 V) (I _C = -2.0 mA, V _{CE} = -5.0 V) (Note 2)	h _{FE} h _{FE(1)}/h_{FE(2)}}}	- 220 0.9	150 290 1.0	- 475 1.1	-
Collector - Emitter Saturation Voltage (I _C = -10 mA, I _B = -0.5 mA) (I _C = -100 mA, I _B = -5.0 mA)	V _{CE(sat)}	- -	- -	-300 -650	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 -900	- -	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)}}}	-600 - -	- - -1.0	-750 -820 -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

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



NST65010MMR6

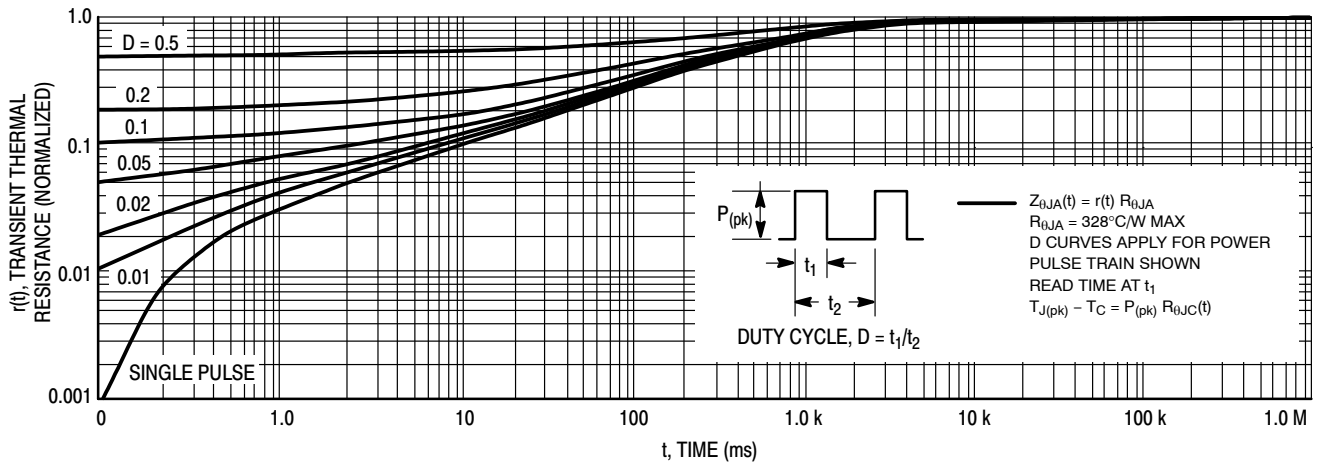


Figure 7. Thermal Response

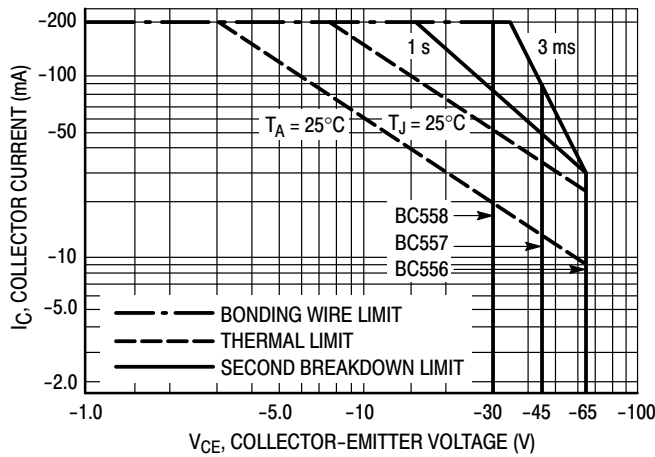


Figure 8. Active Region Safe Operating Area

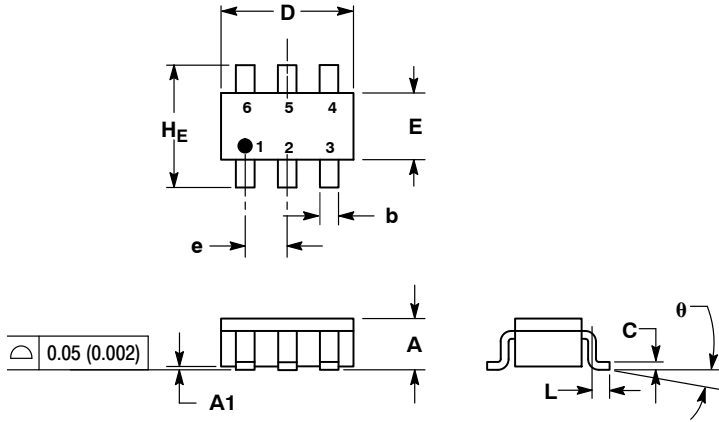
The safe operating area curves indicate I_C - V_{CE} limits of the transistor that must be observed for reliable operation. Collector load lines for specific circuits must fall below the limits indicated by the applicable curve.

The data of Figure 8 is based upon $T_{J(pk)} = 150^\circ\text{C}$; T_C or T_A is variable depending upon conditions. Pulse curves are valid for duty cycles to 10% provided $T_{J(pk)} \leq 150^\circ\text{C}$. $T_{J(pk)}$ may be calculated from the data in Figure 7. At high case or ambient temperatures, thermal limitations will reduce the power that can be handled to values less than the limitations imposed by the secondary breakdown.

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PACKAGE DIMENSIONS

SC-74
CASE 318F-05
ISSUE N

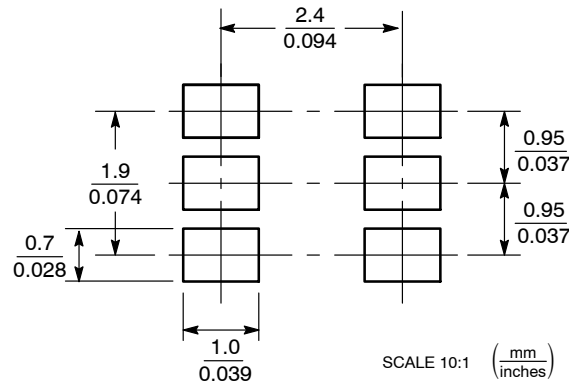


NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH THICKNESS. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF BASE MATERIAL.
4. 318F-01, -02, -03, -04 OBSOLETE. NEW STANDARD 318F-05.

DIM	MILLIMETERS			INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.90	1.00	1.10	0.035	0.039	0.043
A1	0.01	0.06	0.10	0.001	0.002	0.004
b	0.25	0.37	0.50	0.010	0.015	0.020
c	0.10	0.18	0.26	0.004	0.007	0.010
D	2.90	3.00	3.10	0.114	0.118	0.122
E	1.30	1.50	1.70	0.051	0.059	0.067
e	0.85	0.95	1.05	0.034	0.037	0.041
L	0.20	0.40	0.60	0.008	0.016	0.024
HE	2.50	2.75	3.00	0.099	0.108	0.118
θ	0°	-	10°	0°	-	10°

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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