NSM80100MT1G

PNP Transistor with Dual Series Switching Diode

Features

- These Devices are Pb−Free, Halogen Free/BFR Free and are RoHS Compliant

Typical Applications

- LCD Control Board
- High Speed Switching
- High Voltage Switching

MAXIMUM RATINGS – PNP TRANSISTOR

Rating	Symbol	Value	Unit
Collector – Emitter Voltage	V_{CEO}	−80	Vdc
Collector – Base Voltage	V_{CBO}	−80	Vdc
Emitter – Base Voltage	V_{EBO}	−4.0	Vdc
Collector Current – Continuous	I_C	−500	mAdc

MAXIMUM RATINGS – SWITCHING DIODE

Rating	Symbol	Value	Unit
Peak Reverse Voltage	V_R	100	V
Peak Forward Current	I_F	200	mA
Peak Forward Surge Current t < 1 sec t = 1 μsec	I_{FSM}	1.0 20	A
Operating and Storage Junction Temperature Range	T_J, T_{stg}	−55 to +150	°C

THERMAL CHARACTERISTICS

Rating	Symbol	Max	Unit
Total Device Dissipation FR−5 Board, (Note 1) @ T_A = 25°C Derate above 25°C	P_D	400	mW mW/°C
Thermal Resistance from Junction−to−Ambient (Note 1)	$R_{\theta JA}$	313	°C/W
Total Device Dissipation FR−5 Board (Note 2) T_A = 25°C Derate above 25°C	P_D	270	mW mW/°C
Thermal Resistance, Junction−to−Ambient (Note 2)	$R_{\theta JA}$	463	°C/W
Junction and Storage Temperature Range	T_J, T_{stg}	−55 to +150	°C

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.

1. FR−5 = 650 mm^2 pad, 2.0 oz Cu.
2. FR−5 = 10 mm^2 pad, 2.0 oz Cu.

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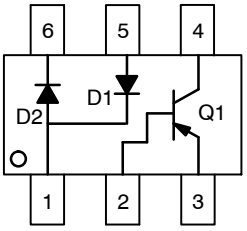
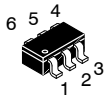
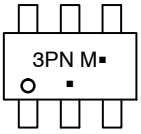
PNP Transistor with Dual Series Switching Diode





SC−74
CASE 318F

MARKING DIAGRAM



3PN = Device Code
M = Date Code*
▪ = Pb−Free Package

(Note: Microdot may be in either location)

*Date Code orientation may vary depending upon manufacturing location.

ORDERING INFORMATION

Device	Package	Shipping†
NSM80100MT1G	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 Specification Brochure, BRD8011/D.

Q1: PNP TRANSISTOR
ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted)

Characteristic	Symbol	Min	Max	Unit
OFF CHARACTERISTICS				
Collector – Emitter Breakdown Voltage (Note 3) (I_C = −1.0 mA, I_B = 0)	$V_{(BR)CEO}$	−80	–	V
Emitter – Base Breakdown Voltage (I_E = −100 μA, I_C = 0)	$V_{(BR)EBO}$	−4.0	–	V
Collector Cutoff Current (V_{CE} = −60 V, I_B = 0)	I_{CES}	–	−0.1	μA
Collector Cutoff Current (V_{CB} = −80 V, I_E = 0)	I_{CBO}	–	−0.1	μA
ON CHARACTERISTICS (Note 3)				
DC Current Gain (I_C = −10 mA, V_{CE} = −1.0 V)	h_{FE}	120	–	–
Collector – Emitter Saturation Voltage (I_C = −100 mA, I_B = −10 mA)	$V_{CE(sat)}$	–	−0.25	V
Base – Emitter Saturation Voltage (I_C = −100 mA, V_{CE} = −1.0 V)	$V_{BE(sat)}$	–	−1.2	V
SMALL– SIGNAL CHARACTERISTICS				
Current – Gain – Bandwidth Product (Note 4) (I_C = −100 mA, V_{CE} = −2.0 V, f = 100 MHz)	f_T	150	–	MHz

3. Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle ≤ 2.0%.
4. fT is defined as the frequency at which $|h_{fe}|$ extrapolates to unity.

D1, D2: SWITCHING DIODE (T_A = 25°C unless otherwise noted)

Characteristic	Symbol	Min	Max	Unit
OFF CHARACTERISTICS				
Reverse Breakdown Voltage	$V_{(BR)}$	75	–	V
Reverse Voltage Leakage Current (V_R = 75 V) (V_R = 20 V, T_J = 150°C) (V_R = 75 V, T_J = 150°C)	I_R	– – –	1.0 30 100	μA
Diode Capacitance (V_R = 0 V, f = 1.0 MHz)	C_D	–	1.5	pF
Forward Voltage (I_F = 1.0 mA) (I_F = 10 mA) (I_F = 50 mA) (I_F = 150 mA)	V_F	– – – –	715 855 1000 1250	mV
Reverse Recovery Time (I_F = I_R = 10 mA, $i_{R(REC)}$ = 1.0 mA, R_L = 100 Ω)	t_{rr}	–	4.0	ns
Forward Recovery Voltage (I_F = 10 mA, t_r = 20 ns)	V_{FR}	–	1.75	V

TYPICAL CHARACTERISTICS

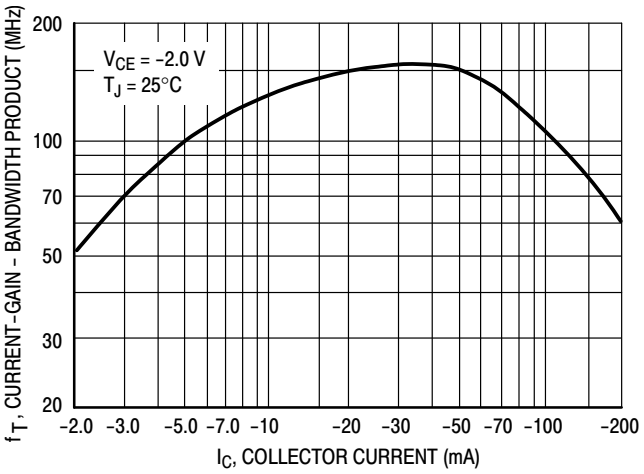


Figure 1. Current−Gain — Bandwidth Product

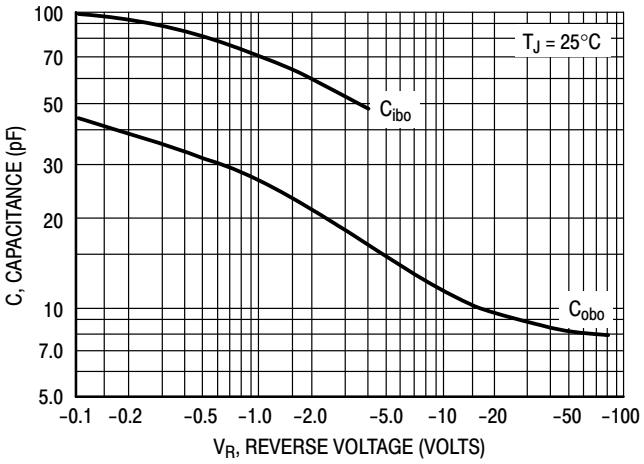


Figure 2. Capacitance

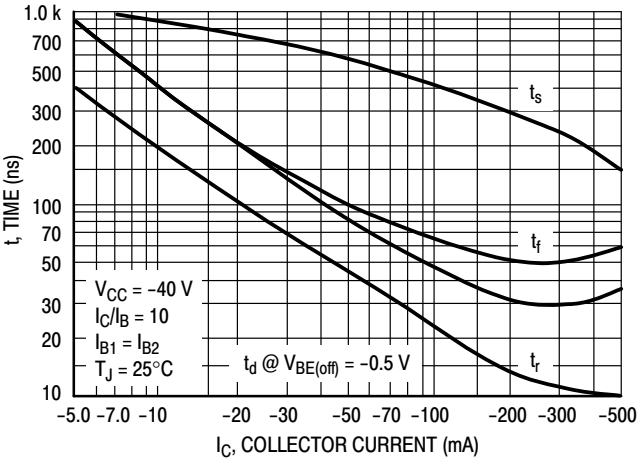


Figure 3. Switching Time

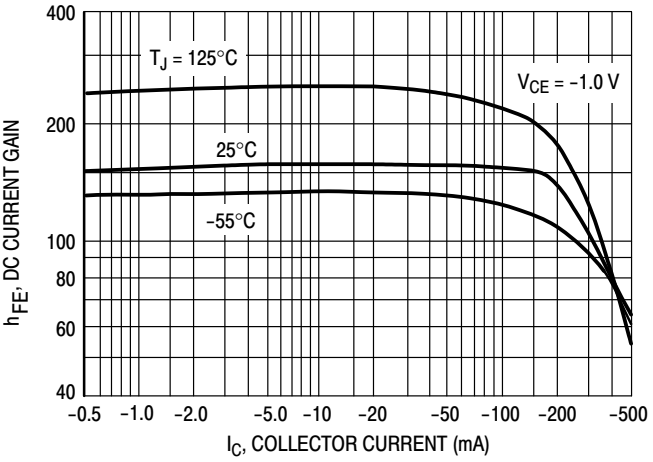


Figure 4. DC Current Gain

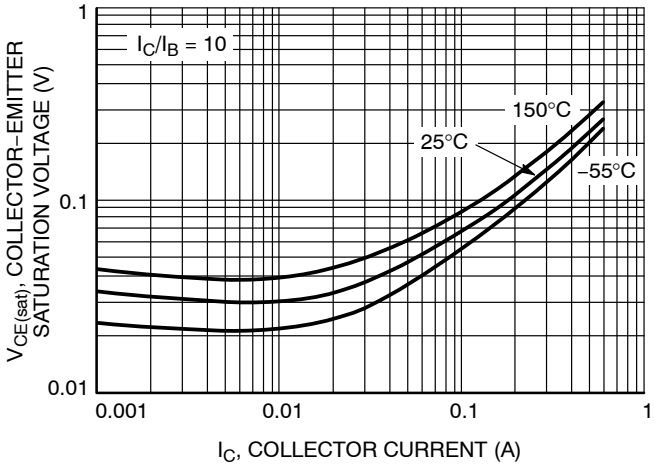


Figure 5. Collector Emitter Saturation Voltage vs. Collector Current

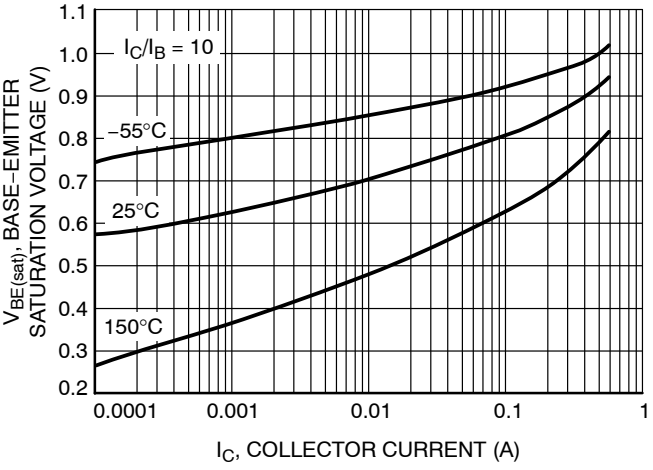


Figure 6. Base Emitter Saturation Voltage vs. Collector Current

TYPICAL CHARACTERISTICS

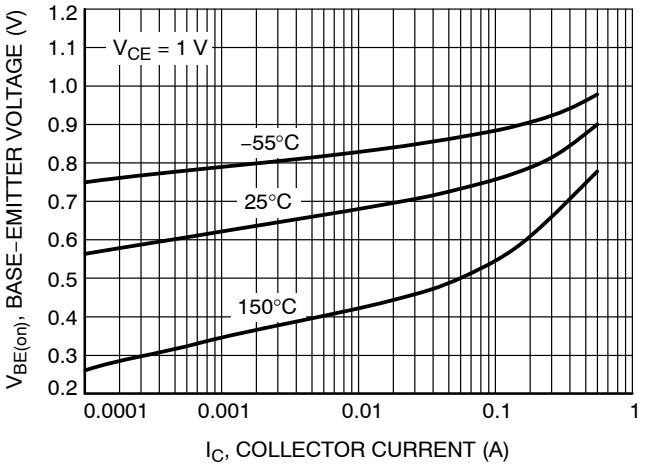


Figure 7. Base Emitter Voltage vs. Collector Current

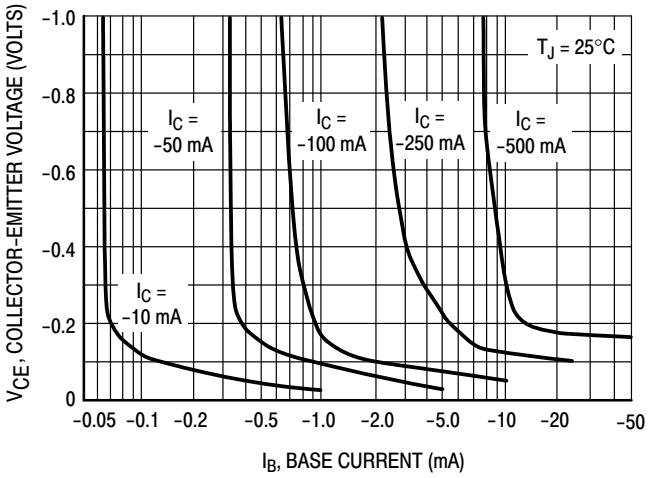


Figure 8. Collector Saturation Region

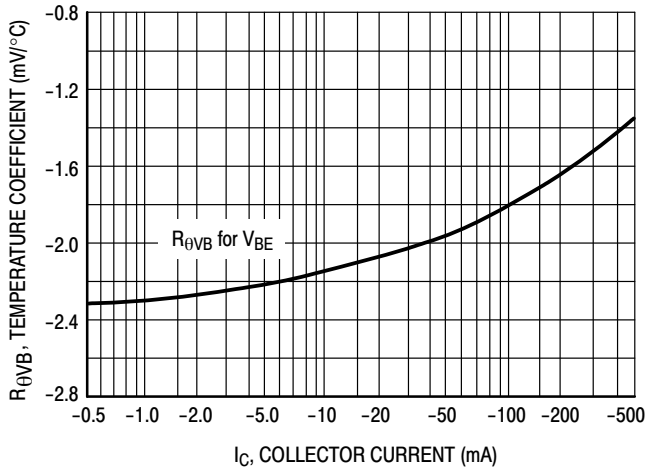


Figure 9. Base−Emitter Temperature Coefficient

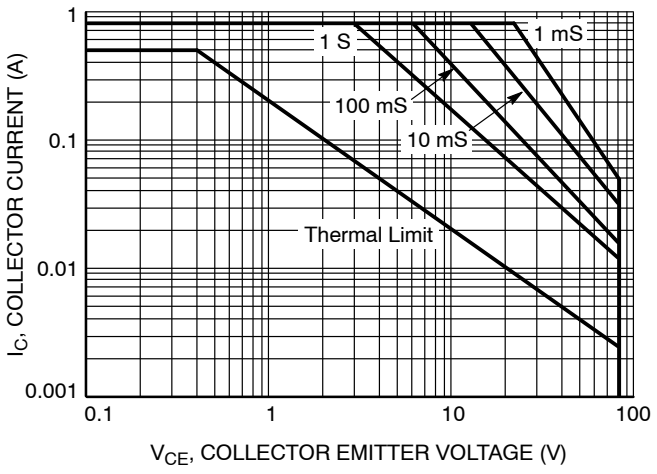


Figure 10. Safe Operating Area

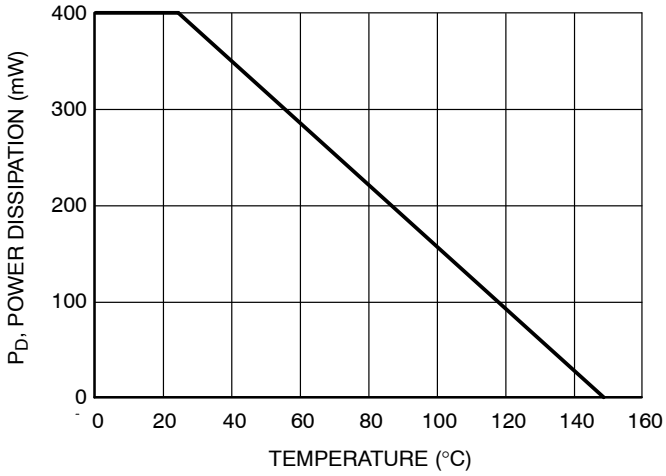


Figure 11. Operating Temperature Derating

TYPICAL CHARACTERISTICS

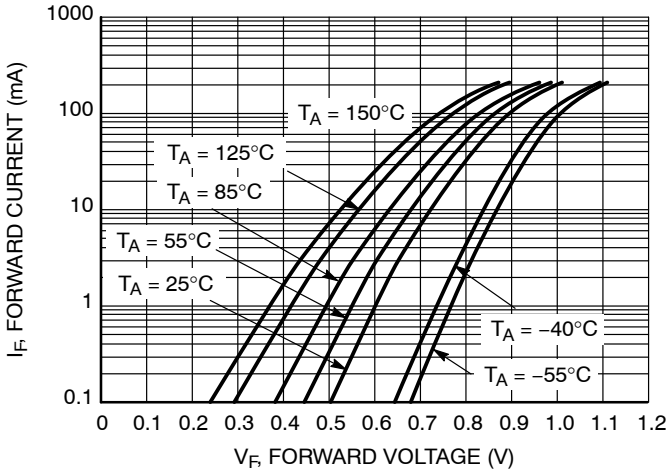


Figure 12. Forward Voltage

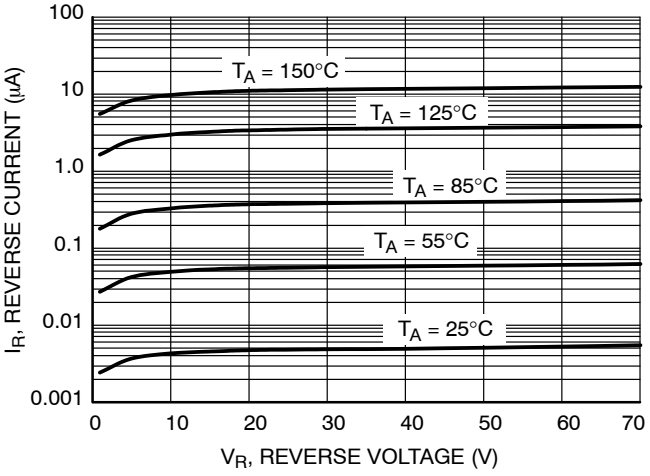


Figure 13. Leakage Current

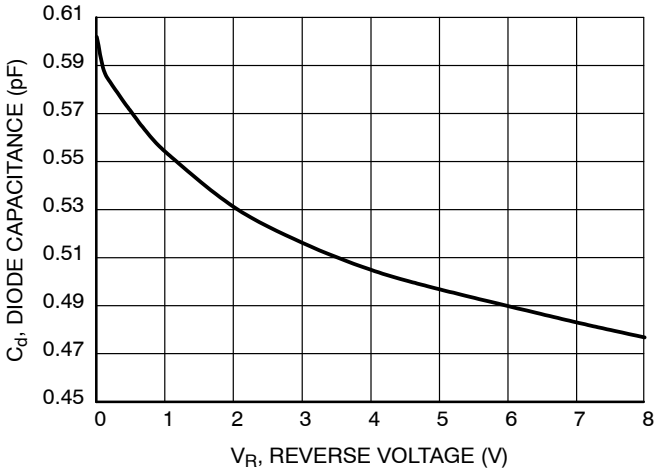


Figure 14. Capacitance

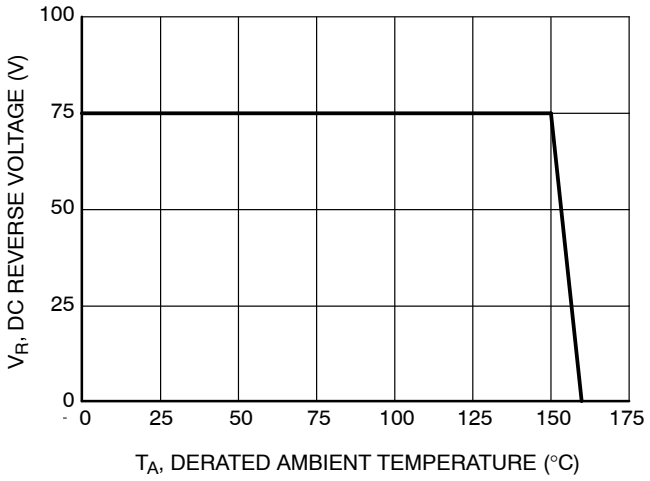
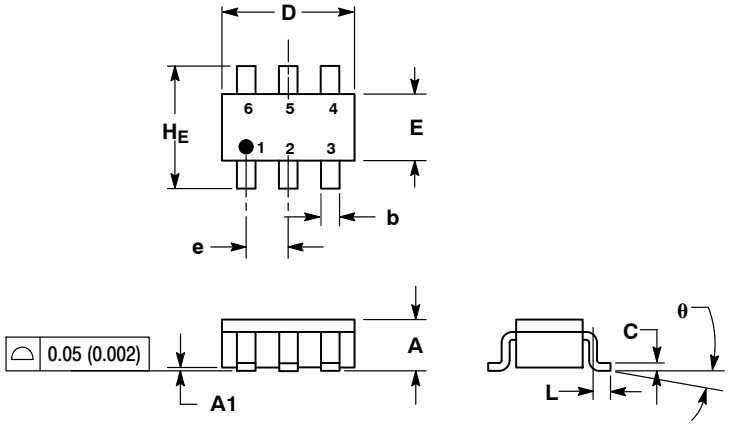


Figure 15. Diode Power Dissipation Curve

NSM80100MT1G

PACKAGE DIMENSIONS

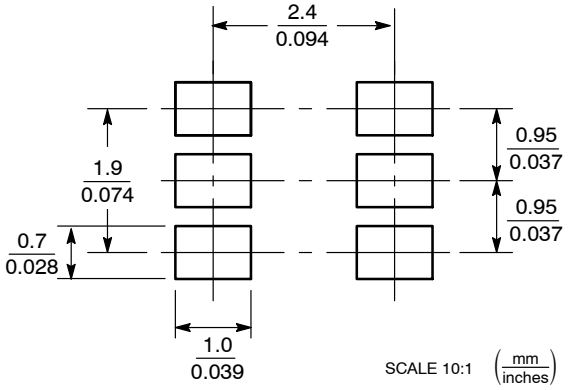
SC−74
CASE 318F−05
ISSUE M



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 OBSOLETE. NEW STANDARD 318F−04.

	MILLIMETERS			INCHES		
DIM	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
H_E	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.

PUBLICATION ORDERING INFORMATION

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