30 V, 0.7 A, Low V_{CE(sat)} NPN Transistor

ON Semiconductor's e^2 PowerEdge family of low $V_{CE(sat)}$ transistors are miniature surface mount devices featuring ultra low saturation voltage ($V_{CE(sat)}$) and high current gain capability. These are designed for use in low voltage, high speed switching applications where affordable efficient energy control is important.

Typical application are DC–DC converters and power management in portable and battery powered products such as cellular and cordless phones, PDAs, computers, printers, digital cameras and MP3 players. Other applications are low voltage motor controls in mass storage products such as disc drives and tape drives. In the automotive industry they can be used in air bag deployment and in the instrument cluster. The high current gain allows e²PowerEdge devices to be driven directly from PMU's control outputs, and the Linear Gain (Beta) makes them ideal components in analog amplifiers.

• This is a Pb-Free Device

MAXIMUM RATINGS (T_C = 25°C unless otherwise noted)

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V _{CEO}	30	V
Collector-Base Voltage	V _{CBO}	40	V
Emitter-Base Voltage	V _{EBO}	5.0	V
Collector Current	I _C	700	mA
Base Current	I _B	350	mA
Total Power Dissipation @ T _C = 25°C Total Power Dissipation @ T _C = 85°C Thermal Resistance – Junction–to–Ambient (Note 1)	P _D P _D R _{θJA}	342 178 366	mW mW °C/W
Total Power Dissipation @ T _C = 25°C Total Power Dissipation @ T _C = 85°C Thermal Resistance – Junction–to–Ambient (Note 2)	P _D P _D R _{θJA}	665 346 188	mW mW °C/W
Operating and Storage Temperature Range	T _J , T _{stg}	-55 to +150	°C

Maximum ratings are those values beyond which device damage can occur. Maximum ratings applied to the device are individual stress limit values (not normal operating conditions) and are not valid simultaneously. If these limits are exceeded, device functional operation is not implied, damage may occur and reliability may be affected.

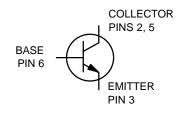
- 1. Minimum FR-4 or G-10 PCB, Operating to Steady State.
- Mounted onto a 2" square FR-4 Board (1" sq 2 oz Cu 0.06" thick single sided), Operating to Steady State.



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$\begin{array}{c} 30 \text{ VOLTS} \\ 0.7 \text{ AMPS} \\ \text{NPN LOW V}_{\text{CE(sat)}} \text{ TRANSISTOR} \\ \text{EQUIVALENT R}_{\text{DS(on)}} \text{ 200 m} \Omega \end{array}$





SC-74 CASE 318F STYLE 2

DEVICE MARKING



VS3 = Specific Device Code M = Date Code

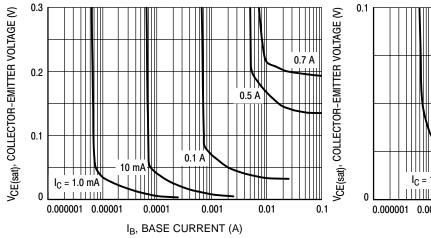
ORDERING INFORMATION

Device	Package	Shipping [†]
NSS30071MR6T1G	SC-74 (Pb-Free)	10000/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.

ELECTRICAL CHARACTERISTICS ($T_C = 25^{\circ}C$ unless otherwise noted)

Symbol	Characteristic		Min	Тур	Max	Unit
OFF CHARACTERISTICS						
V _{(BR)CBO}	Collector - Base Breakdown Voltage	(I _C = 100 μAdc)	40	_	_	Vdc
V _{(BR)CEO}	Collector - Emitter Breakdown Voltage	(I _C = 10 mAdc)	30	-	-	Vdc
V _{(BR)EBO}	Emitter-Base Breakdown Voltage	(I _E = 100 μAdc)	5.0	-	-	Vdc
I _{CBO}	Collector Cutoff Current	$(V_{CB} = 25 \text{ Vdc}, I_E = 0 \text{ Adc})$ $(V_{CB} = 25 \text{ Vdc}, I_E = 0 \text{ Adc}, T_A = 125^{\circ}\text{C})$	-	_ _	1.0 10	μAdc
I _{EBO}	Emitter Cutoff Current	(V _{EB} = 5.0 Vdc, I _C = 0 Adc)	_	_	10	μAdc
ON CHAR	ACTERISTICS			•		
h _{FE}	DC Current Gain	$(V_{CE} = 3.0 \text{ Vdc}, I_{C} = 100 \text{ mAdc})$	150	-	-	Vdc
V _{CE(sat)}	Collector - Emitter Saturation Voltage	$(I_C = 500 \text{ mAdc}, I_B = 50 \text{ mAdc})$	_	-	0.25	Vdc
V _{CE(sat)}	Collector - Emitter Saturation Voltage	(I _C = 700 mAdc, I _B = 70 mAdc)	_	-	0.4	Vdc
V _{BE(sat)}	Base-Emitter Saturation Voltage	$(I_C = 700 \text{ mAdc}, I_B = 70 \text{ mAdc})$	-	_	1.1	Vdc
V _{BE(on)}	Collector-Emitter Saturation Voltage	(I _C = 700 mAdc, V _{CE} = 1.0 Vdc)	_	-	1.0	Vdc



0.1 A 10 m/ 0.000001 0.00001 0.01 IB, BASE CURRENT (A)

Figure 1. Collector Saturation Region

Figure 2. Collector Saturation Region

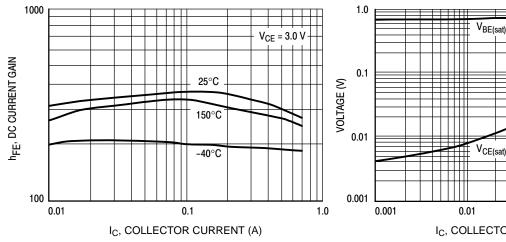


Figure 3. DC Current Gain

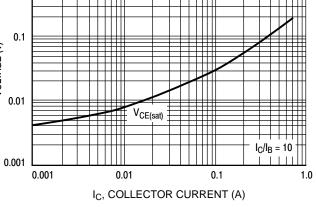


Figure 4. "ON" Voltages

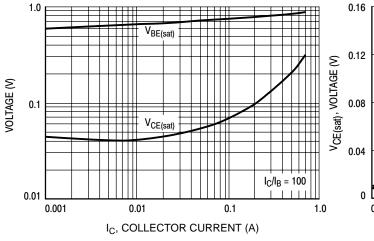


Figure 5. "ON" Voltages

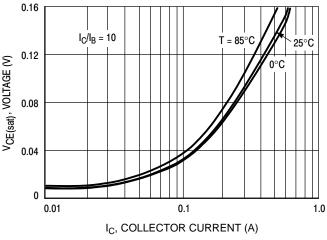


Figure 6. Collector-Emitter Saturation Voltage

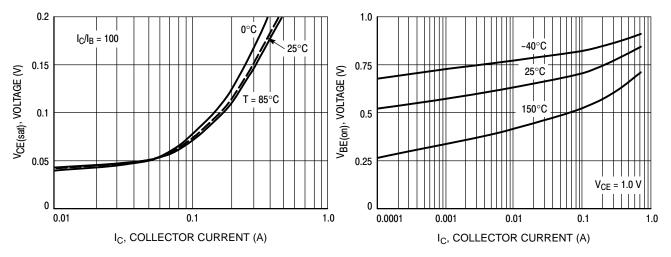


Figure 7. Collector-Emitter Saturation Voltage

Figure 8. V_{BE(on)} Voltage

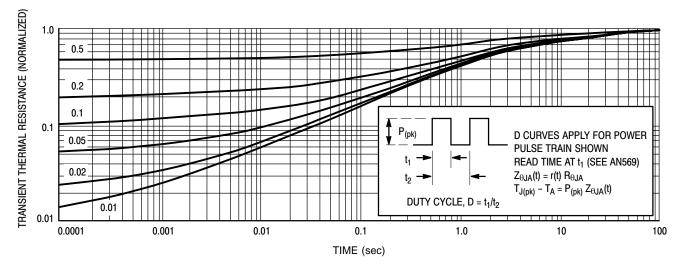
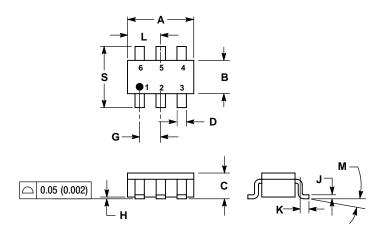


Figure 9. Thermal Response Curve

PACKAGE DIMENSIONS

SC-74 CASE 318F-05 ISSUE K

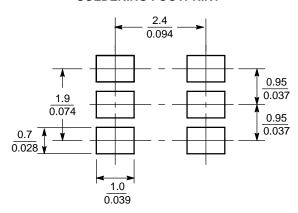


- NOTES:
 1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
 2. CONTROLLING DIMENSION: INCH.
 3. MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH THICKNESS. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF BASE MATERIAL.
 4. 318F-01, -02, -03 OBSOLETE. NEW STANDARD 318F-04.

	INCHES		MILLIN	WETERS	
DIM	MIN	MAX	MIN	MAX	
Α	0.1142	0.1220	2.90	3.10	
В	0.0512	0.0669	1.30	1.70	
C	0.0354	0.0433	0.90	1.10	
D	0.0098	0.0197	0.25	0.50	
G	0.0335	0.0413	0.85	1.05	
Н	0.0005	0.0040	0.013	0.100	
7	0.0040	0.0102	0.10	0.26	
K	0.0079	0.0236	0.20	0.60	
L	0.0493	0.0649	1.25	1.65	
M	0 °	10°	0 °	10°	
S	0.0985	0.1181	2.50	3.00	

- STYLE 2:
 PIN 1. NO CONNECTION
 2. COLLECTOR
 3. EMITTER
 4. NO CONNECTION
 5. COLLECTOR
 6. BASE

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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