

NSS40600CF8T1G

40 V, 7.0 A, Low $V_{CE(sat)}$ PNP Transistor

ON Semiconductor's e²PowerEdge 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 applications 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 ($T_A = 25^\circ\text{C}$)

Rating	Symbol	Max	Unit
Collector-Emitter Voltage	V_{CEO}	-40	Vdc
Collector-Base Voltage	V_{CBO}	-40	Vdc
Emitter-Base Voltage	V_{EBO}	-7.0	Vdc
Collector Current - Continuous	I_C	-6.0	Adc
Collector Current - Peak	I_{CM}	-7.0	A
Electrostatic Discharge	ESD	HBM Class 3B MM Class C	

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Total Device Dissipation, $T_A = 25^\circ\text{C}$ Derate above 25°C	P_D (Note 1)	830 6.7	mW mW/ $^\circ\text{C}$
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$ (Note 1)	150	$^\circ\text{C}/\text{W}$
Total Device Dissipation, $T_A = 25^\circ\text{C}$ Derate above 25°C	P_D (Note 2)	1.4 11.1	W mW/ $^\circ\text{C}$
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$ (Note 2)	90	$^\circ\text{C}/\text{W}$
Thermal Resistance, Junction-to-Lead #1	$R_{\theta JL}$ (Note 2)	15	$^\circ\text{C}/\text{W}$
Total Device Dissipation (Single Pulse < 10 sec)	$P_{D\text{single}}$ (Notes 2 & 3)	2.75	W
Junction and Storage Temperature Range	T_J, T_{stg}	-55 to +150	$^\circ\text{C}$

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.

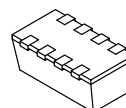
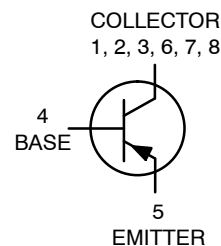
1. FR-4 @ 100 mm², 1 oz copper traces.
2. FR-4 @ 500 mm², 1 oz copper traces.
3. Thermal response.



ON Semiconductor[®]

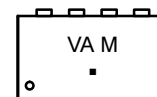
<http://onsemi.com>

**-40 VOLTS, 7.0 AMPS
PNP LOW $V_{CE(sat)}$ TRANSISTOR
EQUIVALENT $R_{DS(on)}$ 45 m Ω**



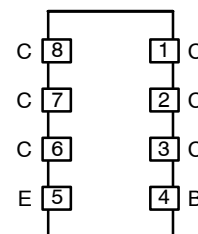
**ChipFET™
CASE 1206A
STYLE 4**

MARKING DIAGRAM



VA = Specific Device Code
M = Month Code
▪ = Pb-Free Package

PIN CONNECTIONS



ORDERING INFORMATION

Device	Package	Shipping†
NSS40600CF8T1G	ChipFET (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 ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Characteristic	Symbol	Min	Typical	Max	Unit
OFF CHARACTERISTICS					
Collector - Emitter Breakdown Voltage ($I_C = -10 \text{ mA}$, $I_B = 0$)	$V_{(BR)CEO}$	-40	-	-	Vdc
Collector - Base Breakdown Voltage ($I_C = -0.1 \text{ mA}$, $I_E = 0$)	$V_{(BR)CBO}$	-40	-	-	Vdc
Emitter - Base Breakdown Voltage ($I_E = -0.1 \text{ mA}$, $I_C = 0$)	$V_{(BR)EBO}$	-7.0	-	-	Vdc
Collector Cutoff Current ($V_{CB} = -40 \text{ Vdc}$, $I_E = 0$)	I_{CBO}	-	-	-0.1	μA dc
Emitter Cutoff Current ($V_{EB} = -7.0 \text{ Vdc}$)	I_{EBO}	-	-	-0.1	μA dc
Collector Cutoff Current ($V_{CB} = -6.5 \text{ Vdc}$, $V_{BE(off)} = 0 \text{ Vdc}$)	I_{CEO}	-	-	-10	μA dc

ON CHARACTERISTICS

DC Current Gain (Note 4) ($I_C = -10 \text{ mA}$, $V_{CE} = -2.0 \text{ V}$) ($I_C = -500 \text{ mA}$, $V_{CE} = -2.0 \text{ V}$) ($I_C = -1.0 \text{ A}$, $V_{CE} = -2.0 \text{ V}$) ($I_C = -2.0 \text{ A}$, $V_{CE} = -2.0 \text{ V}$) ($I_C = -3.0 \text{ A}$, $V_{CE} = -2.0 \text{ V}$)	h_{FE}	250 250 220 180 150	- - 300 - -	- - - - -	
Collector - Emitter Saturation Voltage (Note 4) ($I_C = -0.1 \text{ A}$, $I_B = -0.010 \text{ A}$) (Note 5) ($I_C = -1.0 \text{ A}$, $I_B = -0.100 \text{ A}$) ($I_C = -1.0 \text{ A}$, $I_B = -0.010 \text{ A}$) ($I_C = -2.0 \text{ A}$, $I_B = -0.020 \text{ A}$) ($I_C = -3.0 \text{ A}$, $I_B = -0.030 \text{ A}$) ($I_C = -4.0 \text{ A}$, $I_B = -0.400 \text{ A}$)	$V_{CE(sat)}$	- - - - - -	0.007 0.045 0.080 0.150 0.180 0.160	-0.010 -0.075 -0.110 -0.200 -0.250 -0.220	V
Base - Emitter Saturation Voltage (Note 4) ($I_C = -1.0 \text{ A}$, $I_B = -0.01 \text{ A}$)	$V_{BE(sat)}$	-	-	-0.90	V
Base - Emitter Turn-on Voltage (Note 4) ($I_C = -2.0 \text{ A}$, $V_{CE} = -3.0 \text{ V}$)	$V_{BE(on)}$	-	-	-0.90	V
Cutoff Frequency ($I_C = -100 \text{ mA}$, $V_{CE} = -5.0 \text{ V}$, $f = 100 \text{ MHz}$)	f_T	100	-	-	MHz
Input Capacitance ($V_{EB} = -0.5 \text{ V}$, $f = 1.0 \text{ MHz}$)	C_{ibo}	-	-	650	pF
Output Capacitance ($V_{CB} = -3.0 \text{ V}$, $f = 1.0 \text{ MHz}$)	C_{obo}	-	-	150	pF

SWITCHING CHARACTERISTICS

Delay ($V_{CC} = 30 \text{ V}$, $I_C = 750 \text{ mA}$, $I_{B1} = 15 \text{ mA}$)	t_d	-	-	120	ns
Rise ($V_{CC} = 30 \text{ V}$, $I_C = 750 \text{ mA}$, $I_{B1} = 15 \text{ mA}$)	t_r	-	-	220	ns
Storage ($V_{CC} = 30 \text{ V}$, $I_C = 750 \text{ mA}$, $I_{B1} = 15 \text{ mA}$)	t_s	-	-	650	ns
Fall ($V_{CC} = 30 \text{ V}$, $I_C = 750 \text{ mA}$, $I_{B1} = 15 \text{ mA}$)	t_f	-	-	240	ns

4. Pulsed Condition: Pulse Width = 300 μsec , Duty Cycle $\leq 2\%$.
5. Guaranteed by design but not tested.

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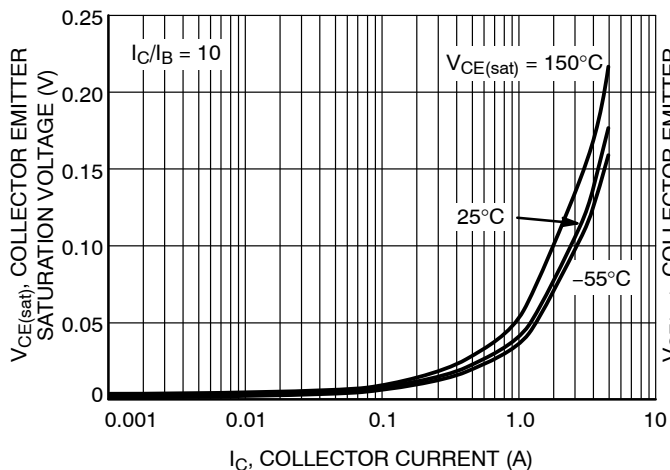


Figure 1. Collector Emitter Saturation Voltage vs. Collector Current

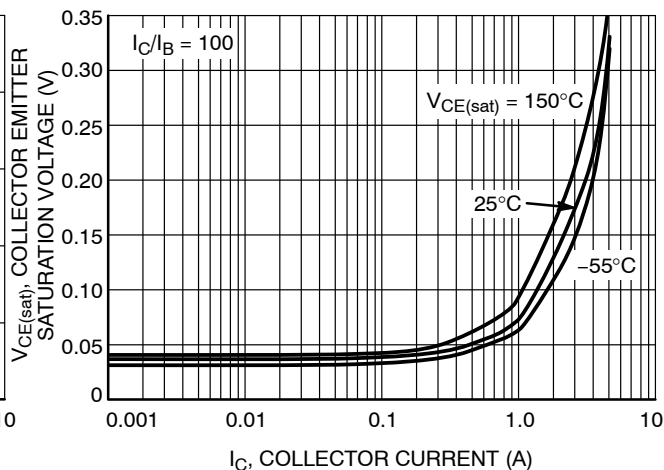


Figure 2. Collector Emitter Saturation Voltage vs. Collector Current

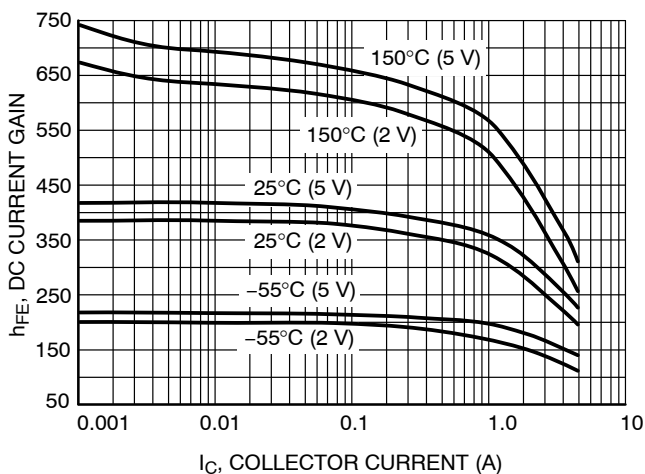


Figure 3. DC Current Gain vs. Collector Current

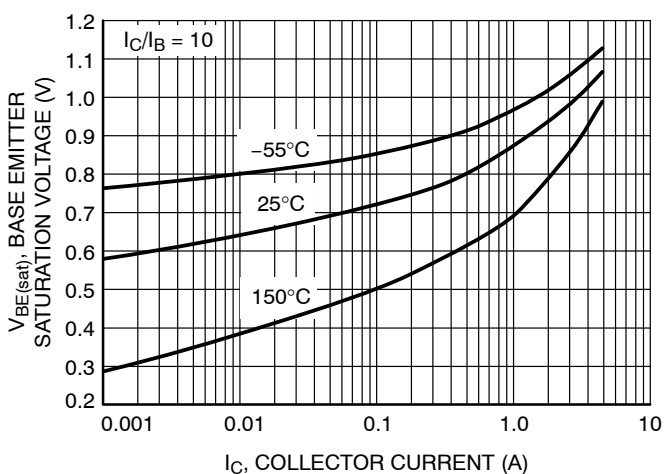


Figure 4. Base Emitter Saturation Voltage vs. Collector Current

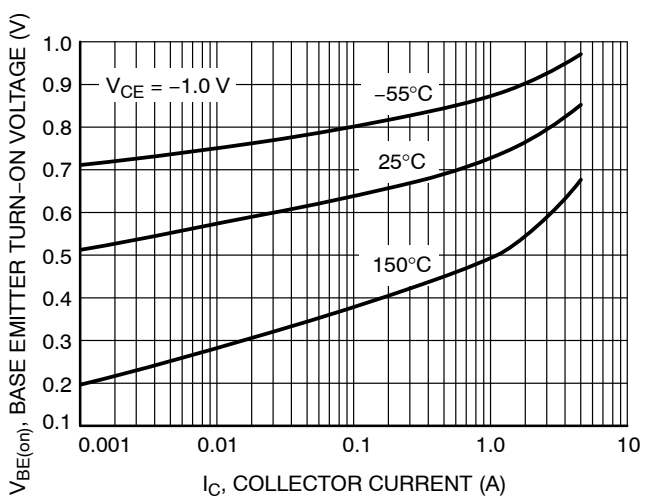


Figure 5. Base Emitter Turn-On Voltage vs. Collector Current

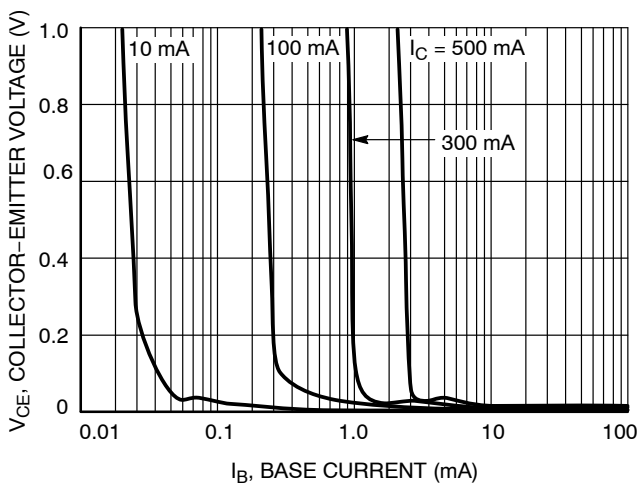


Figure 6. Saturation Region

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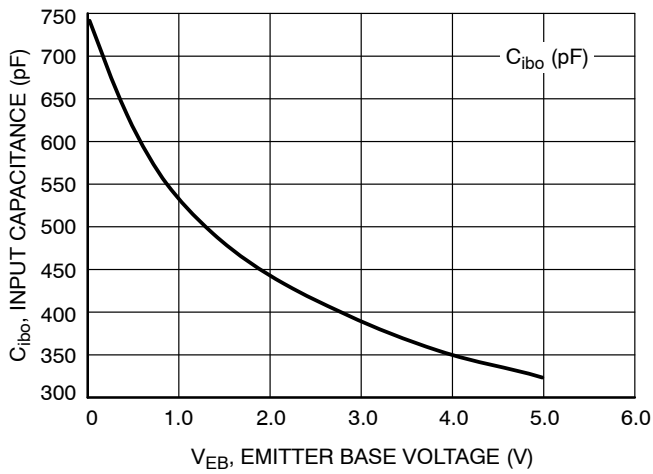


Figure 7. Input Capacitance

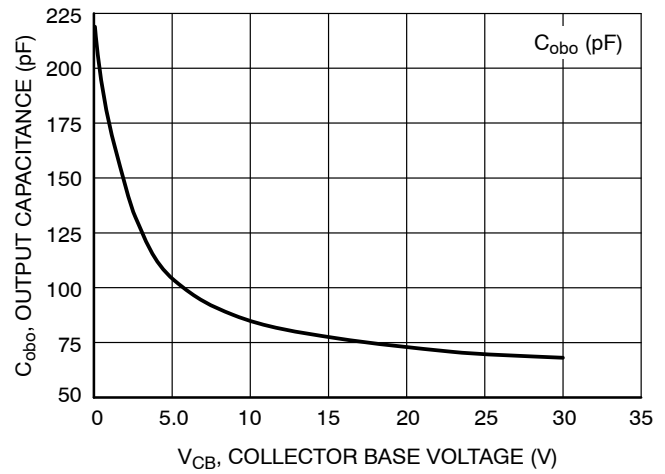


Figure 8. Output Capacitance

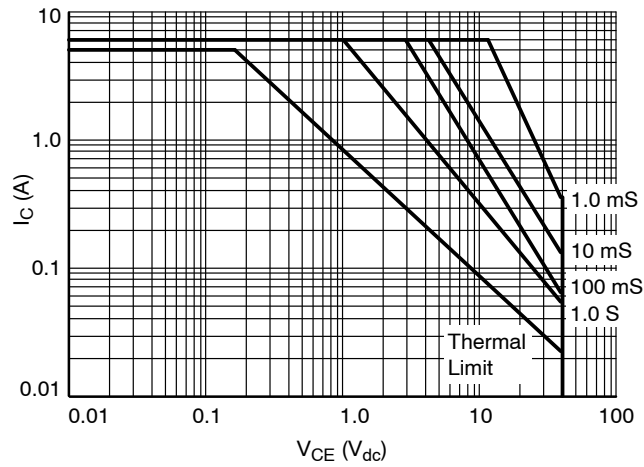
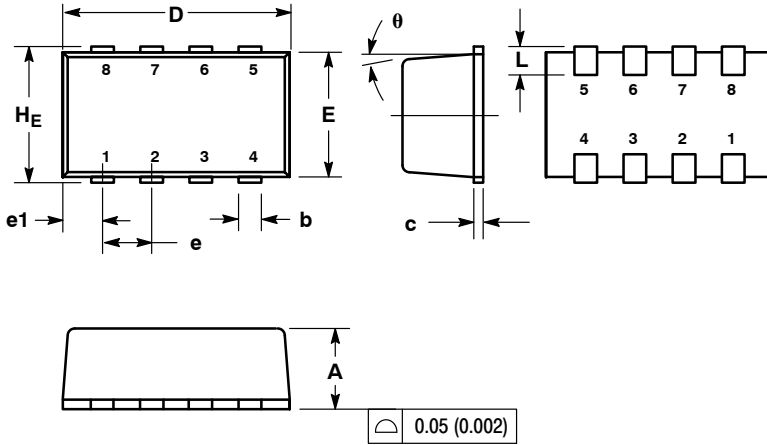


Figure 9. Safe Operating Area

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PACKAGE DIMENSIONS

ChipFET CASE 1206A-03 ISSUE G

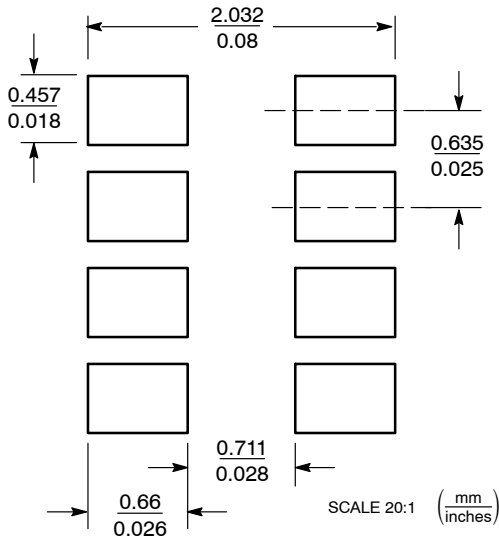


NOTES:

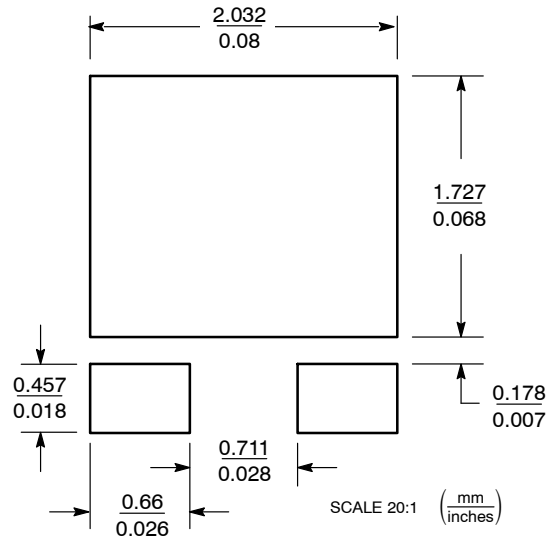
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: MILLIMETER.
3. MOLD GATE BURRS SHALL NOT EXCEED 0.13 MM PER SIDE.
4. LEADFRAME TO MOLDED BODY OFFSET IN HORIZONTAL AND VERTICAL SHALL NOT EXCEED 0.08 MM.
5. DIMENSIONS A AND B EXCLUSIVE OF MOLD GATE BURRS.
6. NO MOLD FLASH ALLOWED ON THE TOP AND BOTTOM LEAD SURFACE.

DIM	MILLIMETERS			INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	1.00	1.05	1.10	0.039	0.041	0.043
b	0.25	0.30	0.35	0.010	0.012	0.014
c	0.10	0.15	0.20	0.004	0.006	0.008
D	2.95	3.05	3.10	0.116	0.120	0.122
E	1.55	1.65	1.70	0.061	0.065	0.067
e	0.65 BSC			0.025 BSC		
e1	0.55 BSC			0.022 BSC		
L	0.28	0.35	0.42	0.011	0.014	0.017
HE	1.80	1.90	2.00	0.071	0.075	0.079
theta	5° NOM			5° NOM		

SOLDERING FOOTPRINT*



Basic



Style 4

*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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