



# STD616A

## HIGH VOLTAGE NPN POWER TRANSISTOR

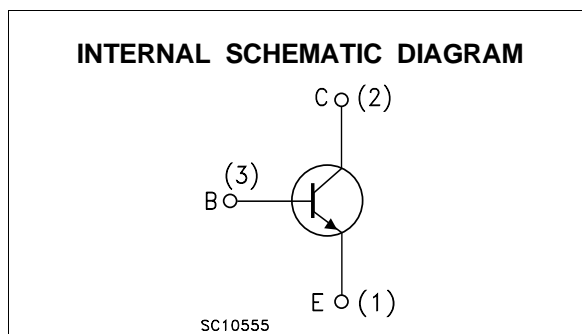
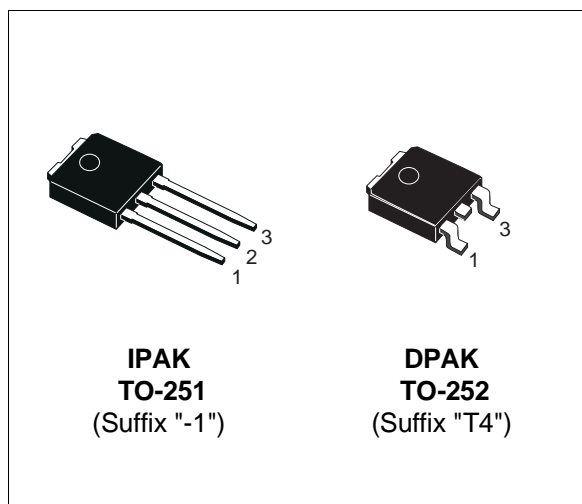
- REVERSE PINS OUT Vs STANDARD IPAK (TO-251) / DPAK (TO-252) PACKAGES
- HIGH VOLTAGE CAPABILITY
- HIGH DC CURRENT GAIN
- THROUGH-HOLE IPAK (TO-251) POWER PACKAGE IN TUBE (SUFFIX "-1")
- SURFACE-MOUNTING DPAK (TO-252) POWER PACKAGE IN TAPE & REEL (SUFFIX "T4")
- MINIMUM LOT-TO-LOT SPREAD FOR RELIABLE OPERATION

### APPLICATIONS:

- SWITCH MODE POWER SUPPLIES

### DESCRIPTION

The STD616A is manufactured using High Voltage Multi Epitaxial Planar technology for high switching speeds and high voltage withstand capability.



### ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
$V_{CES}$	Collector-Emitter Voltage ( $V_{BE} = 0$ )	1000	V
$V_{CEO}$	Collector-Emitter Voltage ( $I_B = 0$ )	450	V
$V_{EBO}$	Emitter-Base Voltage ( $I_C = 0$ )	12	V
$I_C$	Collector Current	1.6	A
$I_{CM}$	Collector Peak Current ( $t_p < 5$ ms)	2.4	A
$I_B$	Base Current	0.8	A
$I_{BM}$	Base Peak Current ( $t_p < 5$ ms)	1.2	A
$P_{tot}$	Total Dissipation at $T_c = 25$ °C	20	W
$T_{stg}$	Storage Temperature	-65 to 150	°C
$T_j$	Max. Operating Junction Temperature	150	°C

## THERMAL DATA

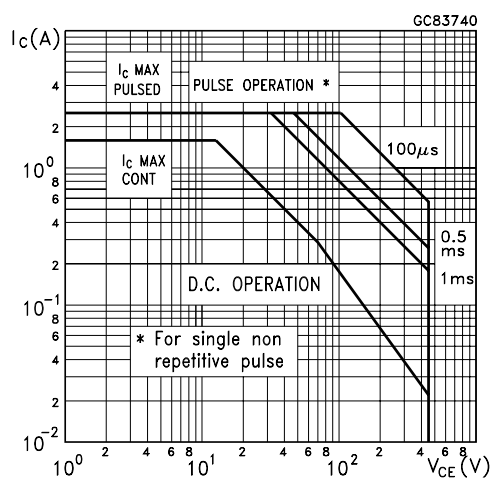
R <sub>thj-case</sub>	Thermal Resistance Junction-case	Max	6.25	°C/W
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ELECTRICAL CHARACTERISTICS (T<sub>case</sub> = 25 °C unless otherwise specified)

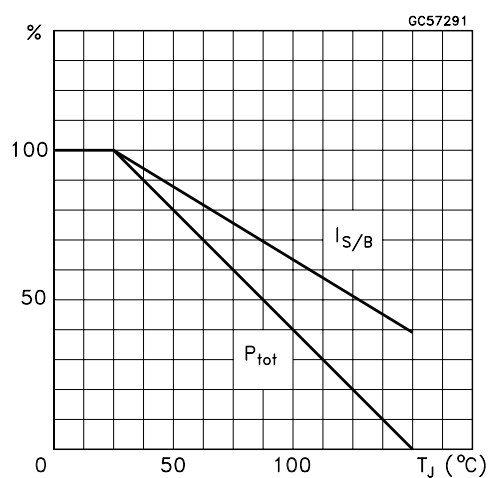
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I <sub>CES</sub>	Collector Cut-off Current (V <sub>BE</sub> = 0 V)	V <sub>CE</sub> = 1000 V V <sub>CE</sub> = 1000 V T <sub>j</sub> = 125 °C			50 0.5	μA mA
V <sub>CEO(sus)*</sub>	Collector-Emitter Sustaining Voltage (I <sub>B</sub> = 0)	I <sub>C</sub> = 100 mA L = 25 mH	450			V
V <sub>EBO</sub>	Emitter-Base Voltage (I <sub>C</sub> = 0)	I <sub>E</sub> = 1 mA	12			V
V <sub>CE(sat)*</sub>	Collector-Emitter Saturation Voltage	I <sub>C</sub> = 250 mA I <sub>B</sub> = 65 mA I <sub>C</sub> = 0.8 A I <sub>B</sub> = 250 mA			0.3 0.5	V V
V <sub>BE(sat)*</sub>	Base-Emitter Saturation Voltage	I <sub>C</sub> = 250 mA I <sub>B</sub> = 65 mA I <sub>C</sub> = 0.8 A I <sub>B</sub> = 250 mA			1 1.2	V V
h <sub>FE</sub> *	DC Current Gain	I <sub>C</sub> = 200 μA V <sub>CE</sub> = 5 V I <sub>C</sub> = 300 mA V <sub>CE</sub> = 5 V I <sub>C</sub> = 480 mA V <sub>CE</sub> = 5 V I <sub>C</sub> = 1.6 A V <sub>CE</sub> = 5 V	17 25 12 4			
t <sub>on</sub> t <sub>s</sub> t <sub>f</sub>	RESISTIVE LOAD Turn On Time Storage Time Fall Time	V <sub>CC</sub> = 250 V I <sub>C</sub> = 250 mA I <sub>B1</sub> = 65 mA I <sub>B2</sub> = -130 mA			0.2 5 0.65	μs μs μs
t <sub>on</sub> t <sub>s</sub> t <sub>f</sub>	RESISTIVE LOAD Turn On Time Storage Time Fall Time	V <sub>CC</sub> = 250 V I <sub>C</sub> = 0.8 A I <sub>B1</sub> = 160 mA I <sub>B2</sub> = -0.4 A			1 2.5 0.35	μs μs μs
t <sub>s</sub> t <sub>f</sub>	INDUCTIVE LOAD Storage Time Fall Time	V <sub>cl</sub> = 300 V I <sub>C</sub> = 250 mA I <sub>B1</sub> = 65 mA I <sub>B2</sub> = -130 mA L = 200 μH			5 0.5	μs μs
t <sub>s</sub> t <sub>f</sub>	INDUCTIVE LOAD Storage Time Fall Time	V <sub>cl</sub> = 300 V I <sub>C</sub> = 0.8 A I <sub>B1</sub> = 160 mA I <sub>B2</sub> = -0.4 A L = 200 μH			2.5 0.25	μs μs

\* Pulsed: Pulse duration = 300 μs, duty cycle 1.5 %

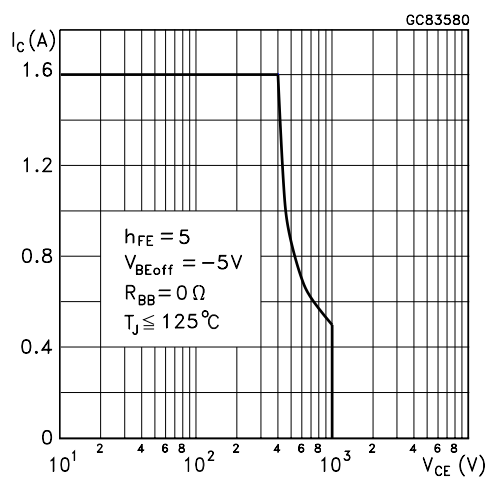
# Safe Operating Area



# Derating Curve

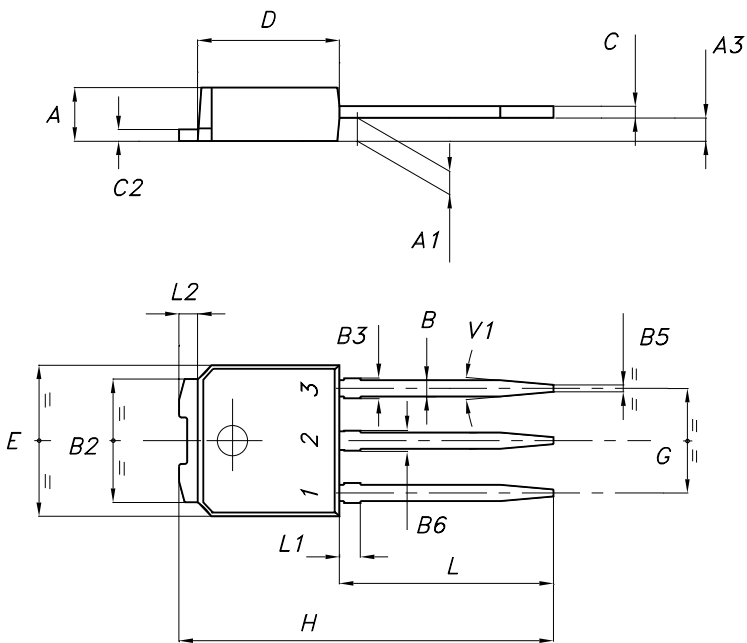


# Reverse Biased SOA



TO-251 (IPAK) MECHANICAL DATA

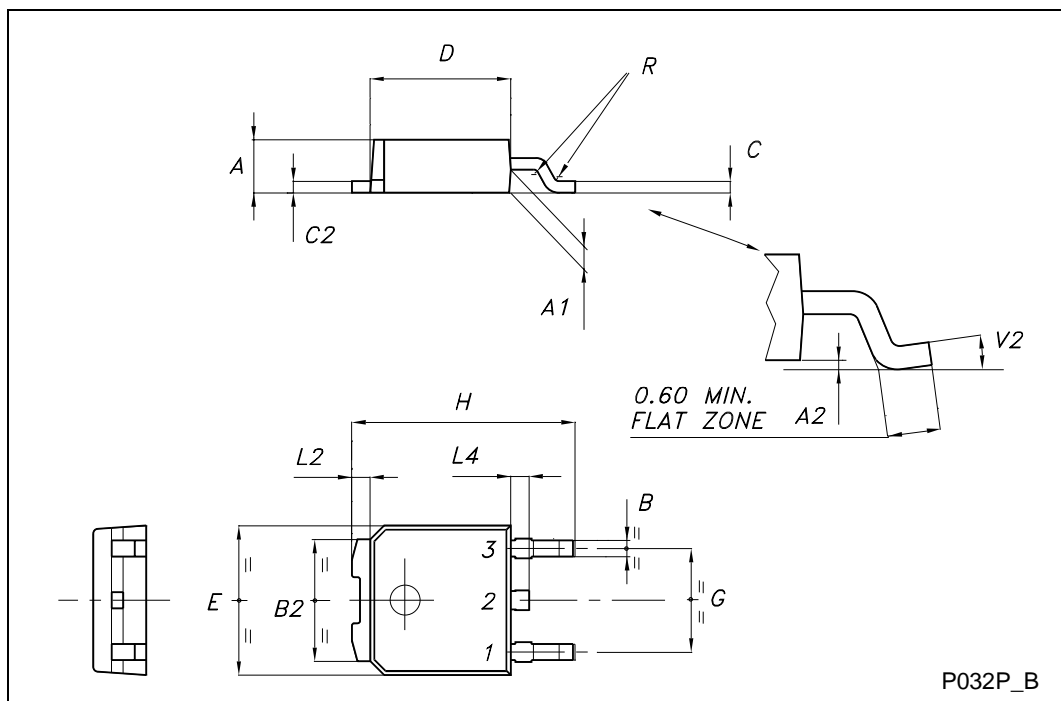
DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	2.20		2.40	0.087		0.094
A1	0.90		1.10	0.035		0.043
A3	0.70		1.30	0.028		0.051
B	0.64		0.90	0.025		0.035
B2	5.20		5.40	0.204		0.213
B3			0.85			0.033
B5		0.30			0.012	
B6			0.95			0.037
C	0.45		0.60	0.018		0.024
C2	0.48		0.60	0.019		0.024
D	6.00		6.20	0.237		0.244
E	6.40		6.60	0.252		0.260
G	4.40		4.60	0.173		0.181
H	15.90		16.30	0.626		0.642
L	9.00		9.40	0.354		0.370
L1	0.80		1.20	0.031		0.047
L2		0.80	1.00		0.031	0.039
V1		10°			10°	



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## TO-252 (DPAK) MECHANICAL DATA

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	2.20		2.40	0.087		0.094
A1	0.90		1.10	0.035		0.043
A2	0.03		0.23	0.001		0.009
B	0.64		0.90	0.025		0.035
B2	5.20		5.40	0.204		0.213
C	0.45		0.60	0.018		0.024
C2	0.48		0.60	0.019		0.024
D	6.00		6.20	0.236		0.244
E	6.40		6.60	0.252		0.260
G	4.40		4.60	0.173		0.181
H	9.35		10.10	0.368		0.398
L2		0.8			0.031	
L4	0.60		1.00	0.024		0.039
V2	0°		8°	0°		0°



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