

## HIGH VOLTAGE NPN POWER TRANSISTOR

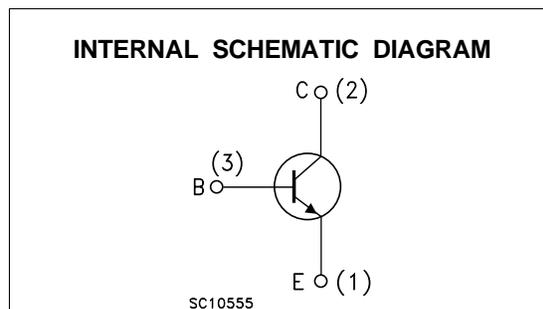
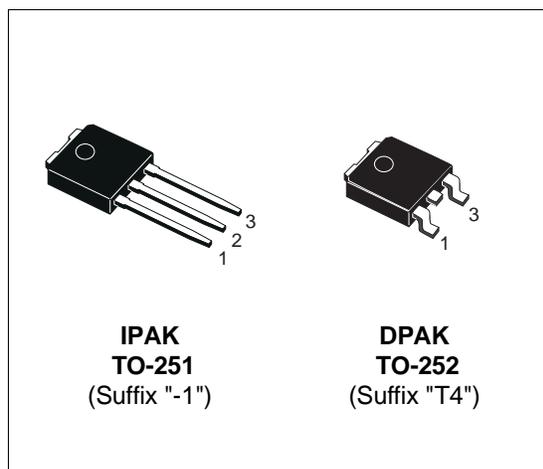
- REVERSE PINS OUT Vs STANDARD IPAK (TO-251) / DPAK (TO-252) PACKAGES
- HIGH VOLTAGE CAPABILITY
- HIGH DC CURRENT GAIN
- THROUGH-HOLE IPAK (TO-251) POWER PACKAGE IN TUBE (SUFFIX "-1")
- SURFACE-MOUNTING DPAK (TO-252) POWER PACKAGE IN TAPE & REEL (SUFFIX "T4")
- MINIMUM LOT-TO-LOT SPREAD FOR RELIABLE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

## STD616A

### THERMAL DATA

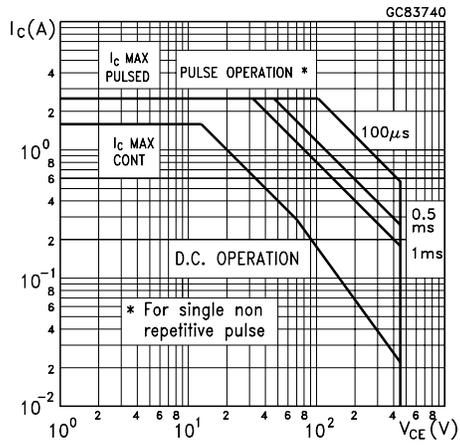
$R_{thj-case}$	Thermal Resistance Junction-case	Max	6.25	$^{\circ}\text{C}/\text{W}$
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### ELECTRICAL CHARACTERISTICS ( $T_{case} = 25^{\circ}\text{C}$ unless otherwise specified)

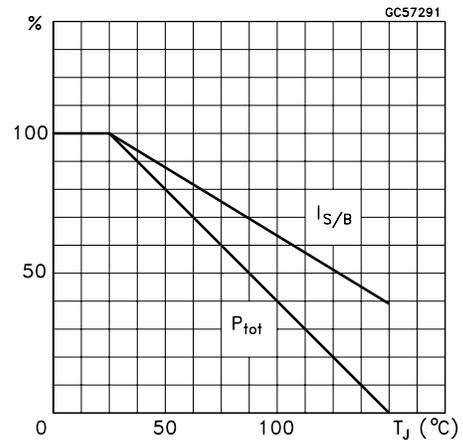
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$I_{CES}$	Collector Cut-off Current ( $V_{BE} = 0\text{ V}$ )	$V_{CE} = 1000\text{ V}$ $V_{CE} = 1000\text{ V}$ $T_j = 125^{\circ}\text{C}$			50 0.5	$\mu\text{A}$ $\text{mA}$
$V_{CEO(sus)*}$	Collector-Emitter Sustaining Voltage ( $I_B = 0$ )	$I_C = 100\text{ mA}$ $L = 25\text{ mH}$	450			V
$V_{EBO}$	Emitter-Base Voltage ( $I_C = 0$ )	$I_E = 1\text{ mA}$	12			V
$V_{CE(sat)*}$	Collector-Emitter Saturation Voltage	$I_C = 250\text{ mA}$ $I_B = 65\text{ mA}$ $I_C = 0.8\text{ A}$ $I_B = 250\text{ mA}$			0.3 0.5	V V
$V_{BE(sat)*}$	Base-Emitter Saturation Voltage	$I_C = 250\text{ mA}$ $I_B = 65\text{ mA}$ $I_C = 0.8\text{ A}$ $I_B = 250\text{ mA}$			1 1.2	V V
$h_{FE*}$	DC Current Gain	$I_C = 200\text{ }\mu\text{A}$ $V_{CE} = 5\text{ V}$ $I_C = 300\text{ mA}$ $V_{CE} = 5\text{ V}$ $I_C = 480\text{ mA}$ $V_{CE} = 5\text{ V}$ $I_C = 1.6\text{ A}$ $V_{CE} = 5\text{ V}$	17 25 12 4			
$t_{on}$ $t_s$ $t_f$	RESISTIVE LOAD Turn On Time Storage Time Fall Time	$V_{CC} = 250\text{ V}$ $I_C = 250\text{ mA}$ $I_{B1} = 65\text{ mA}$ $I_{B2} = -130\text{ mA}$			0.2 5 0.65	$\mu\text{s}$ $\mu\text{s}$ $\mu\text{s}$
$t_{on}$ $t_s$ $t_f$	RESISTIVE LOAD Turn On Time Storage Time Fall Time	$V_{CC} = 250\text{ V}$ $I_C = 0.8\text{ A}$ $I_{B1} = 160\text{ mA}$ $I_{B2} = -0.4\text{ A}$			1 2.5 0.35	$\mu\text{s}$ $\mu\text{s}$ $\mu\text{s}$
$t_s$ $t_f$	INDUCTIVE LOAD Storage Time Fall Time	$V_{cl} = 300\text{ V}$ $I_C = 250\text{ mA}$ $I_{B1} = 65\text{ mA}$ $I_{B2} = -130\text{ mA}$ $L = 200\text{ }\mu\text{H}$			5 0.5	$\mu\text{s}$ $\mu\text{s}$
$t_s$ $t_f$	INDUCTIVE LOAD Storage Time Fall Time	$V_{cl} = 300\text{ V}$ $I_C = 0.8\text{ A}$ $I_{B1} = 160\text{ mA}$ $I_{B2} = -0.4\text{ A}$ $L = 200\text{ }\mu\text{H}$			2.5 0.25	$\mu\text{s}$ $\mu\text{s}$

\* Pulsed: Pulse duration = 300  $\mu\text{s}$ , duty cycle 1.5 %

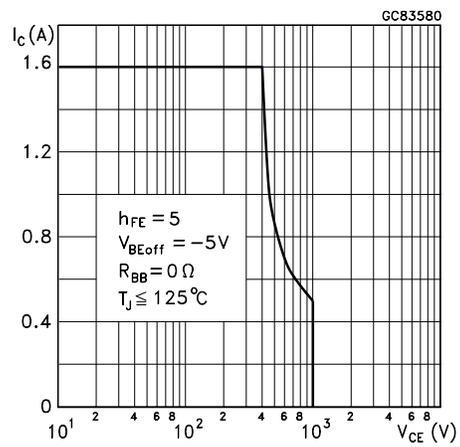
Safe Operating Area



Derating Curve

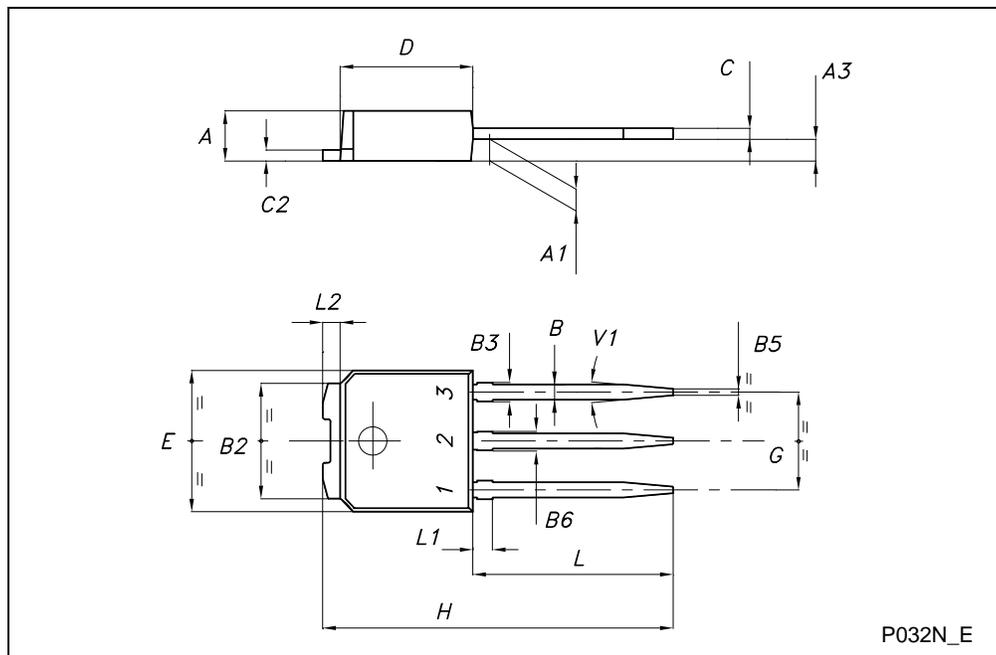


Reverse Biased SOA



**TO-251 (IPAK) MECHANICAL DATA**

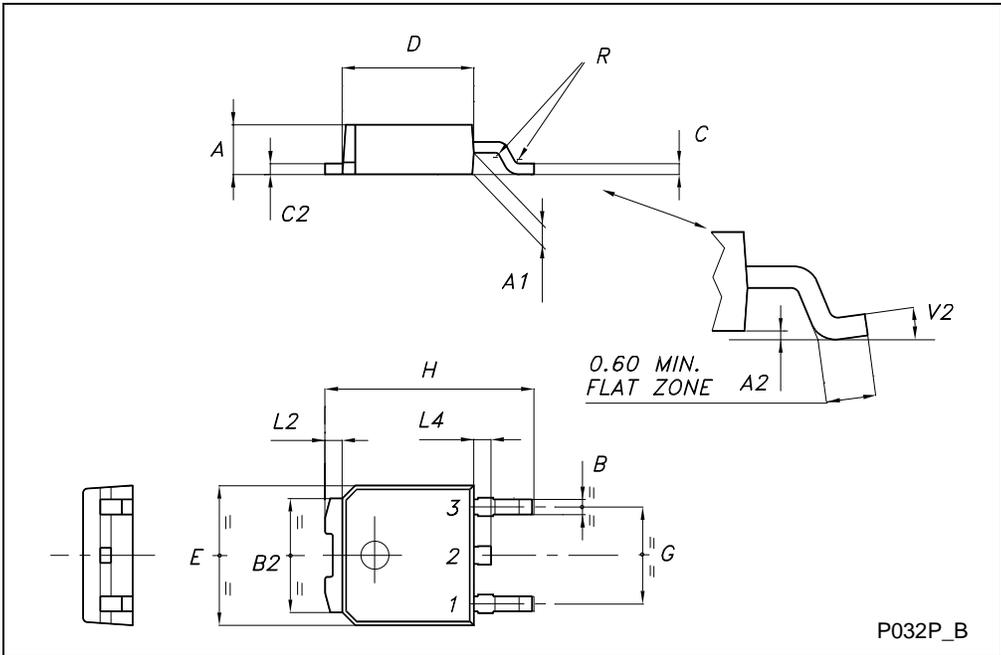
DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	2.20		2.40	0.087		0.094
A1	0.90		1.10	0.035		0.043
A3	0.70		1.30	0.028		0.051
B	0.64		0.90	0.025		0.035
B2	5.20		5.40	0.204		0.213
B3			0.85			0.033
B5		0.30			0.012	
B6			0.95			0.037
C	0.45		0.60	0.018		0.024
C2	0.48		0.60	0.019		0.024
D	6.00		6.20	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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