

HIGH VOLTAGE NPN POWER TRANSISTOR

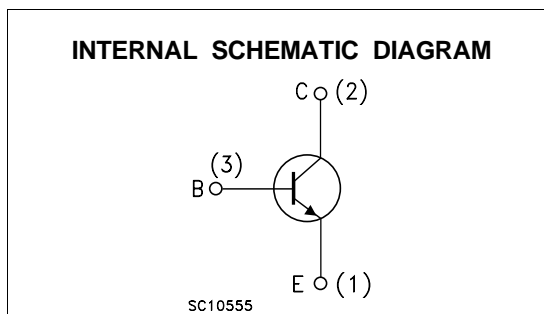
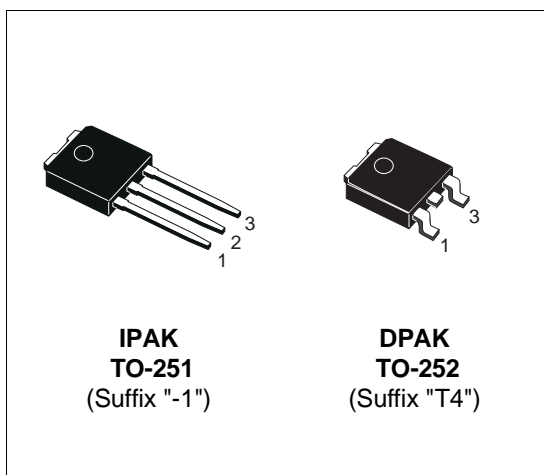
- REVERSE PINS OUT Vs STANDARD IPAK (TO-251) / DPAK (TO-252) PACKAGES
- HIGH VOLTAGE CAPABILITY
- HIGH DC CURRENT GAIN
- THROUGH-HOLE IPAK (TO-251) POWER PACKAGE IN TUBE (SUFFIX "-1")
- SURFACE-MOUNTING DPAK (TO-252) POWER PACKAGE IN TAPE & REEL (SUFFIX "T4")
- MINIMUM LOT-TO-LOT SPREAD FOR RELIABLE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

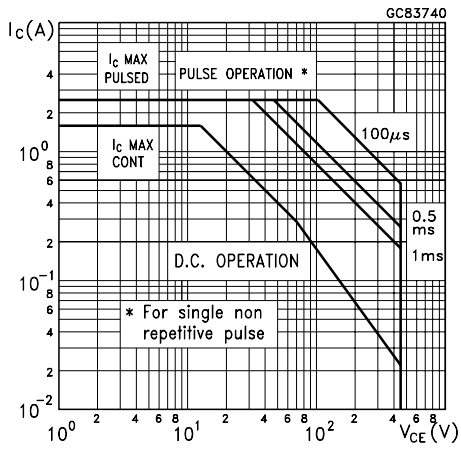
$R_{thj-case}$	Thermal Resistance Junction-case	Max	6.25	$^{\circ}\text{C}/\text{W}$
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ELECTRICAL CHARACTERISTICS ($T_{case} = 25^{\circ}\text{C}$ unless otherwise specified)

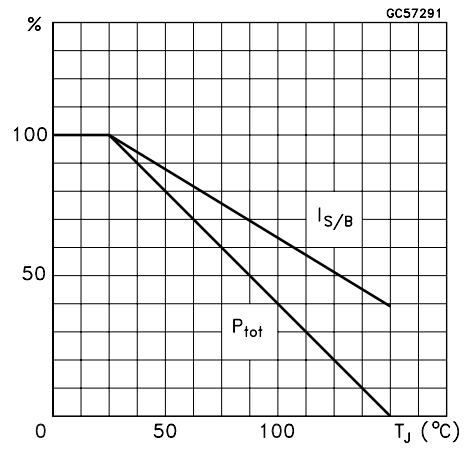
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_{CES}	Collector Cut-off Current ($V_{BE} = 0\text{ V}$)	$V_{CE} = 1000\text{ V}$ $V_{CE} = 1000\text{ V}$ $T_j = 125^{\circ}\text{C}$			50 0.5	μA mA
$V_{CEO(sus)*}$	Collector-Emitter Sustaining Voltage ($I_B = 0$)	$I_C = 100\text{ mA}$ $L = 25\text{ mH}$	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	μs μs μs
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	μs μs μs
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	μs μs
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	μs μs

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

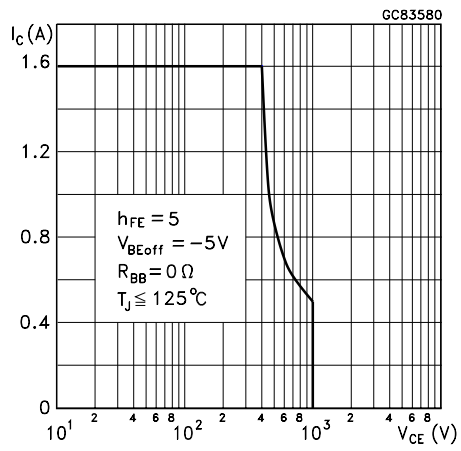
Safe Operating Area



Derating Curve

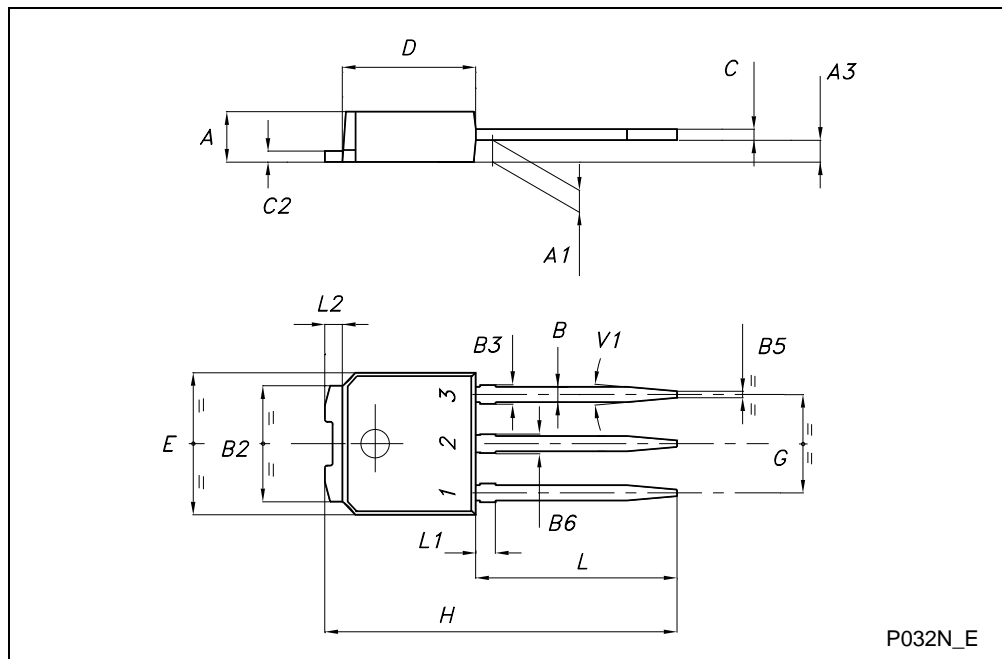


Reverse Biased SOA



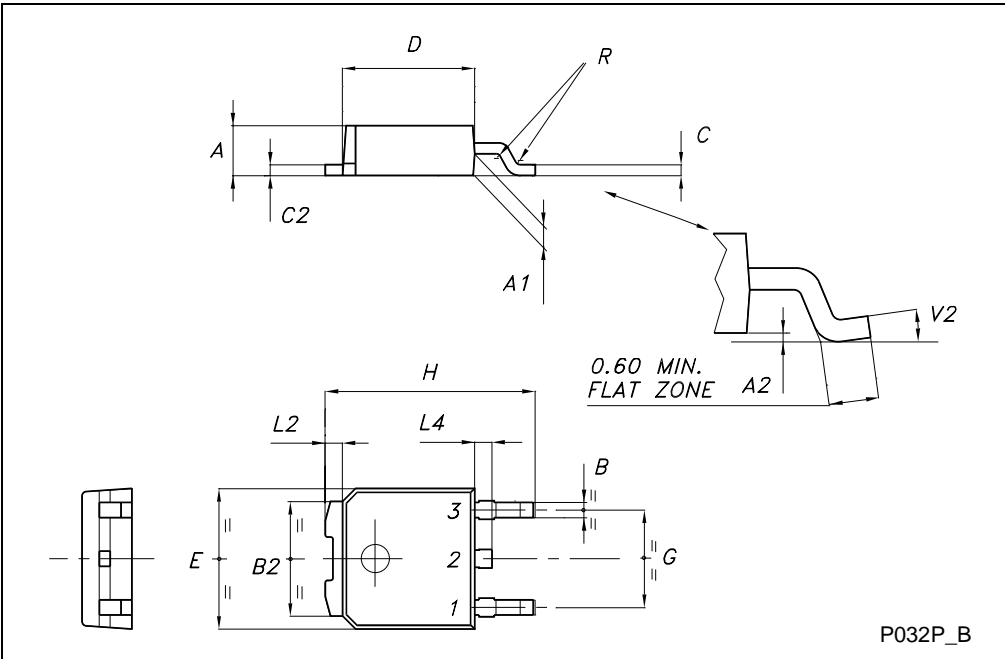
TO-251 (IPAK) MECHANICAL DATA

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°	



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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