



STD616A-1

HIGH VOLTAGE NPN POWER TRANSISTOR

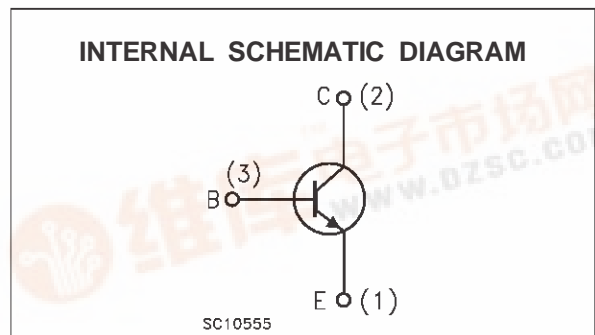
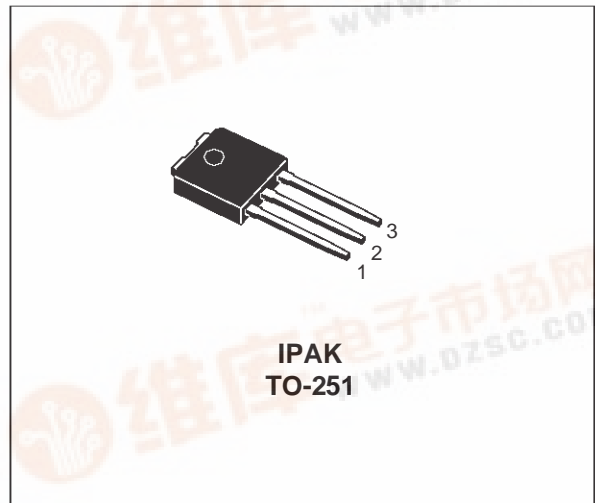
- REVERSE PINS OUT Vs STANDARD IPAK (TO-251) PACKAGE
- HIGH VOLTAGE CAPABILITY
- HIGH DC CURRENT GAIN
- THROUGH-HOLE IPAK (TO-251) POWER PACKAGE IN TUBE
- MINIMUM LOT-TO-LOT SPREAD FOR RELIABLE OPERATION

APPLICATIONS:

- SWITCH MODE POWER SUPPLIES

DESCRIPTION

The STD616A-1 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

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THERMAL DATA

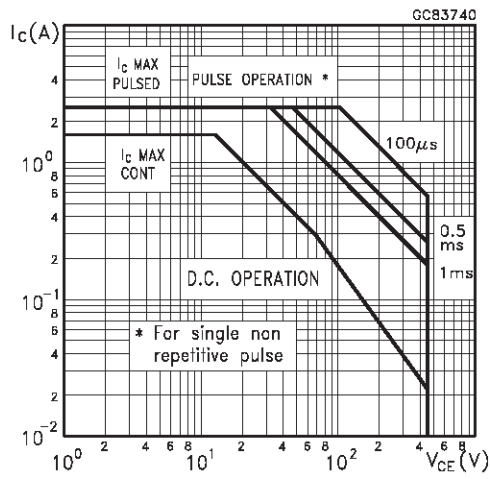
$R_{thj-case}$	Thermal Resistance Junction-case	Max	6.25	°C/W
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ELECTRICAL CHARACTERISTICS ($T_{case} = 25\text{ °C}$ unless otherwise specified)

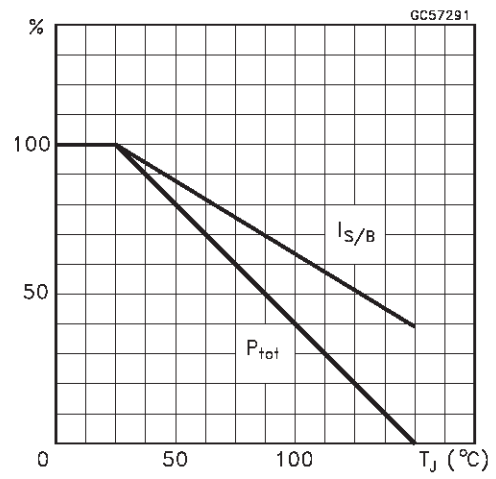
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_{CES}	Collector Cut-off Current ($V_{BE} = 0\text{ V}$)	$V_{CE} = 1000\text{ V}$ $V_{CE} = 1000\text{ V}$ $T_j = 125\text{ °C}$			50 0.5	μA mA
$V_{CE(sus)}$	Collector-Emitter Sustaining Voltage	$I_C = 100\text{ mA}$ $L = 25\text{ mH}$	450			V
V_{BEO}	Collector-Base Sustaining Voltage	$I_C = 1\text{ mA}$	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	$I_C = 250\text{ mA}$ $I_B = 65\text{ mA}$ $I_C = 0.8\text{ A}$ $I_B = 250\text{ mA}$			1.0 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 Turn On Time 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 %

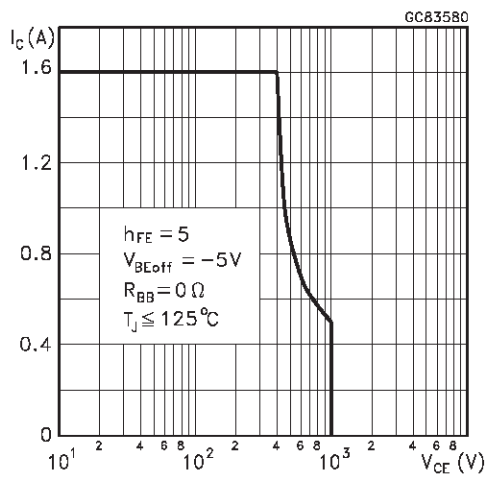
Safe Operating Area



Derating Curve

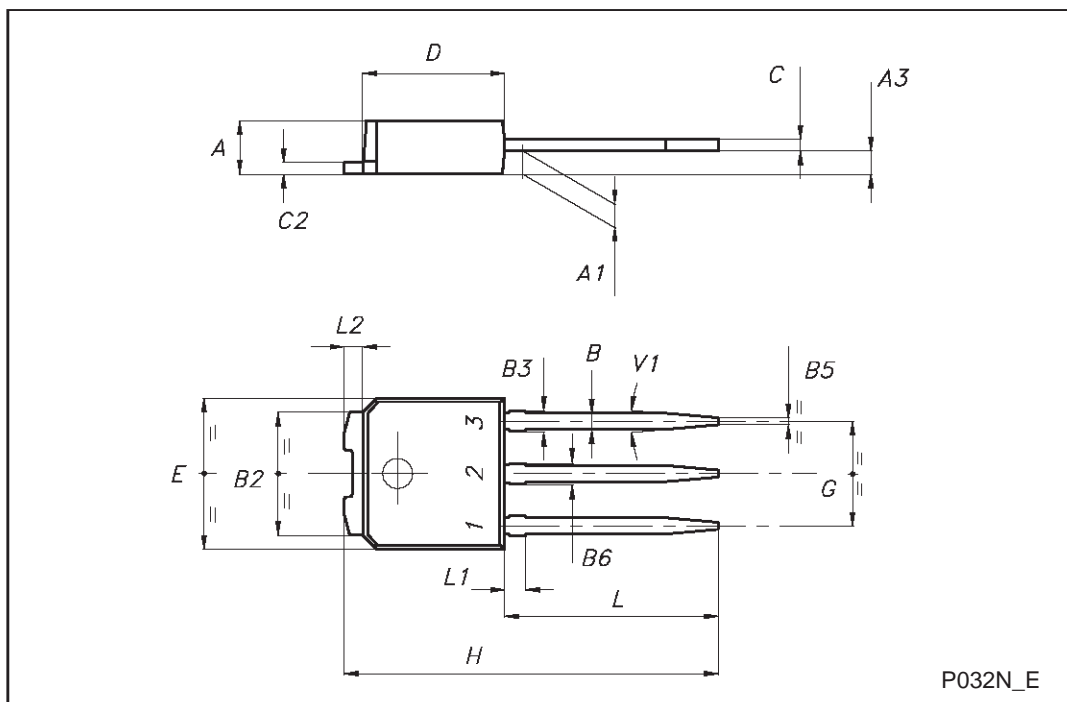


Reverse Biased SOA



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°	



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