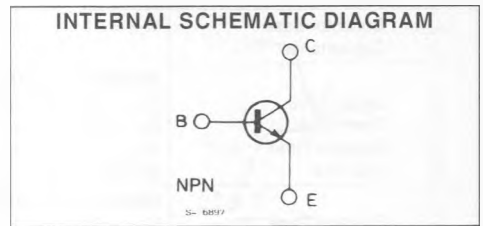
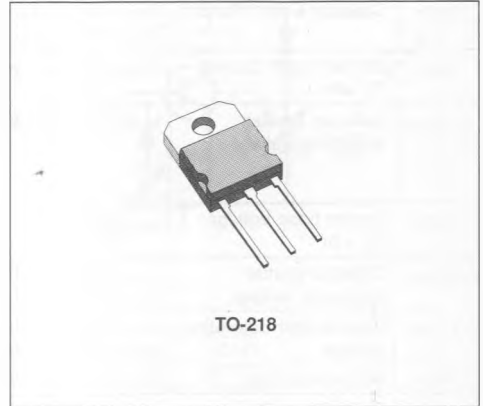


NPN HIGH VOLTAGE POWER TRANSISTORS

- OFF-LINE POWER SUPPLIES
- HIGH VOLTAGE INVERTERS
- SWITCHING REGULATORS



DESCRIPTION

High voltage, high speed, switching power transistors suited for use on medium voltage supply.

ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	2N6933	2N6934	2N6935	Unit
V_{CEV}	Collector-emitter Voltage ($V_{BE} = -1.5\text{ V}$)	450	550	650	V
V_{CEX}	Collector-emitter Voltage	350	400	450	V
V_{CEO}	Collector-emitter Voltage ($I_B = 0$)	300	350	400	V
V_{EBO}	Emitter-base Voltage ($I_C = 0$)	8			V
I_C	Collector Current	15			A
I_{CM}	Collector Peak Current	23			A
I_B	Base Current	5			A
I_{BM}	Base Peak Current	7			A
I_E	Emitter Current	20			A
I_{EM}	Emitter Peak Current	30			A
P_{Tot}	Total Dissipation at $T_C < 25\text{ }^\circ\text{C}$	175			W
T_{stg}	Storage Temperature	- 65 to 150			$^\circ\text{C}$
T_J	Max. Operating Junction Temperature	150			$^\circ\text{C}$

THERMAL DATA

$R_{th(j-case)}$	Thermal Resistance Junction-case	Max.	0.71	$^{\circ}\text{C}/\text{W}$
T_L	Maximum Lead Temperature for Soldering Purpose		235	$^{\circ}\text{C}$

ELECTRICAL CHARACTERISTICS ($T_{case} = 25^{\circ}\text{C}$ unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_{CEV}	Collector Cutoff Current	$V_{CE} = V_{CEV}$ $V_{BE} = -1.5\text{ V}$ $V_{BE} = V_{CEV}$ $V_{BE} = -1.5\text{ V}$ $T_C = 100^{\circ}\text{C}$			0.1 1	mA mA
I_{EBO}	Emitter Cutoff Current ($I_C = 0$)	$V_{EB} = 8\text{ V}$			2	mA
$V_{CE0(sus)}$ *	Collector-emitter sustaining Voltage	$I_C = 0.2\text{ A}$ $L = 25\text{ mH}$ for 2N6933 for 2N6934 for 2N6935	300 350 400			V V V
V_{EBO}	Emitter-base Voltage ($I_C = 0$)	$I_E = 50\text{ mA}$	8			V
$V_{CE(sat)}$ *	Collector-emitter Saturation Voltage	$I_C = 15\text{ A}$ $I_B = 3\text{ A}$ $I_C = 15\text{ A}$ $I_B = 3\text{ A}$ $T_C = 100^{\circ}\text{C}$			1 2	V V
$V_{BE(sat)}$ *	Base-emitter Saturation Voltage	$I_C = 15\text{ A}$ $I_B = 3\text{ A}$ $I_C = 15\text{ A}$ $I_B = 3\text{ A}$ $T_C = 100^{\circ}\text{C}$			1.5 1.5	V V
h_{FE} *	DC Current Gain	$I_C = 15\text{ A}$ $V_{CE} = 3\text{ V}$	8		35	
h_{ie}	Small Signal Current Gain	$I_C = 1\text{ A}$ $V_{CE} = 10\text{ V}$ $f = 5\text{ MHz}$	2		6	
C_{cbo}	Collector-base Capacitance	$V_{CB} = 10\text{ V}$ $f = 1\text{ MHz}$	150		400	pF
t_d t_r t_s t_f	Delay Time Rise Time Storage Time Fall time	RESISTIVE LOAD $V_{CC} = 300\text{ V}$ $I_C = 15\text{ A}$ $R_C = 20\ \Omega$ $I_{B1} = -I_{B2} = 3\text{ A}$ $V_{BB} = -5\text{ V}$ $t_p = 30\ \mu\text{s}$ see fig. 1			0.1 0.7 2.5 0.5	μs μs μs μs
t_s t_f t_c	Storage Time Fall Time Crossover Time	INDUCTIVE LOAD $V_{CC} = 50\text{ V}$ $I_C = 15\text{ A}$ $L_C = 100\ \mu\text{H}$ $I_{B1} = -I_{B2} = 3\text{ A}$ $R_{BB} = 1.5\ \Omega$ $V_{clamp} = V_{CEX}$ $T_C = 100^{\circ}\text{C}$ see fig. 1			3.5 0.4 0.8	μs μs μs
di_c/dt	Turn-on Current Slope	$V_{CC} = 300\text{ V}$ $I_B = 4.5\text{ A}$ $R_C = 0$ $t_p = 3\ \mu\text{s}$ see fig. 2	75			A/ μs
V_{CEX}	Collector-emitter Sustaining Voltage	$V_{CC} = 50\text{ V}$ $I_C = 15\text{ A}$ $L_C = 100\ \mu\text{H}$ $I_{B1} = -I_{B2} = 3\text{ A}$ $R_{BB} = 1.5\ \Omega$ $V_{clamp} = V_{CEX}$ $T_C = 100^{\circ}\text{C}$ see fig. 3 for 2N6933 for 2N6934 for 2N6935	350 400 450			V V V

* Pulse duration = 300 μs , duty cycle 2 %.

Figure 1 : Switching Time Measurements.

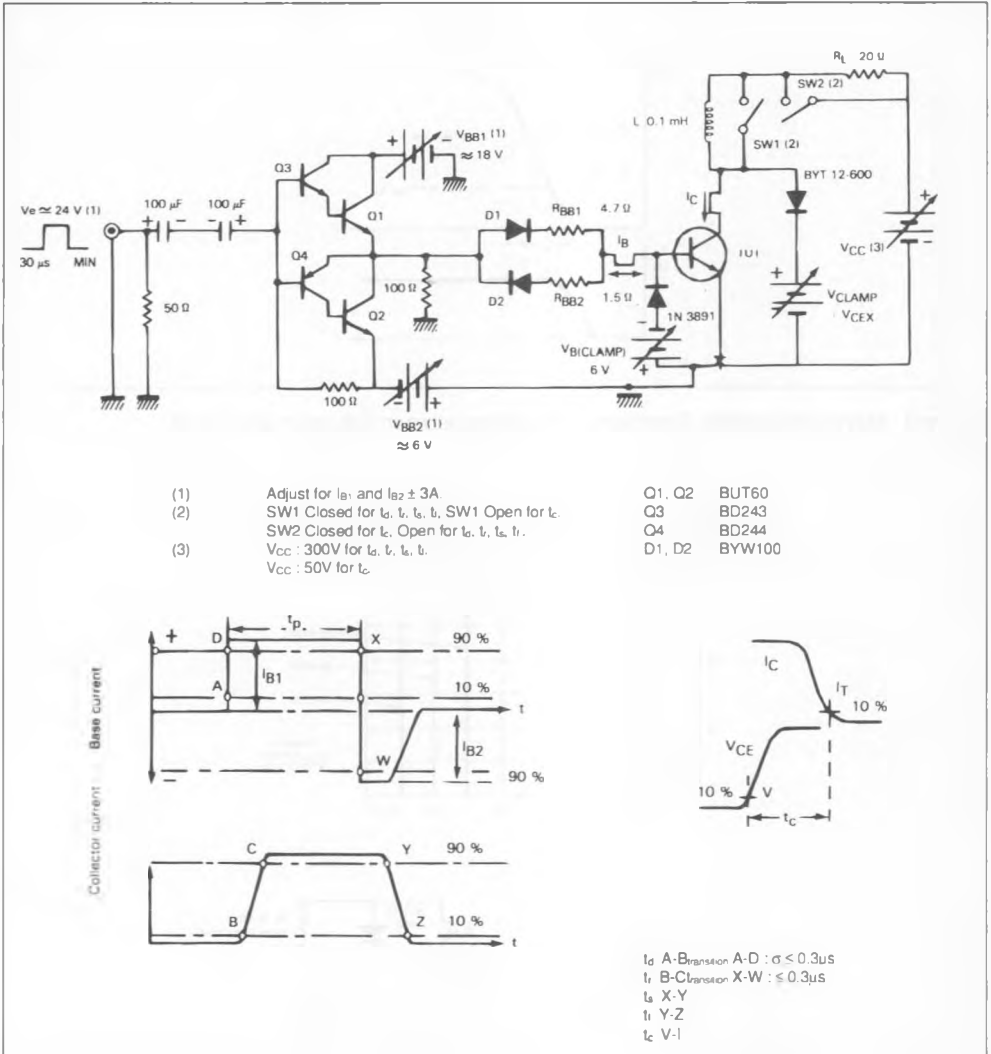


Figure 2 : Turn-on Switching Waveforms.

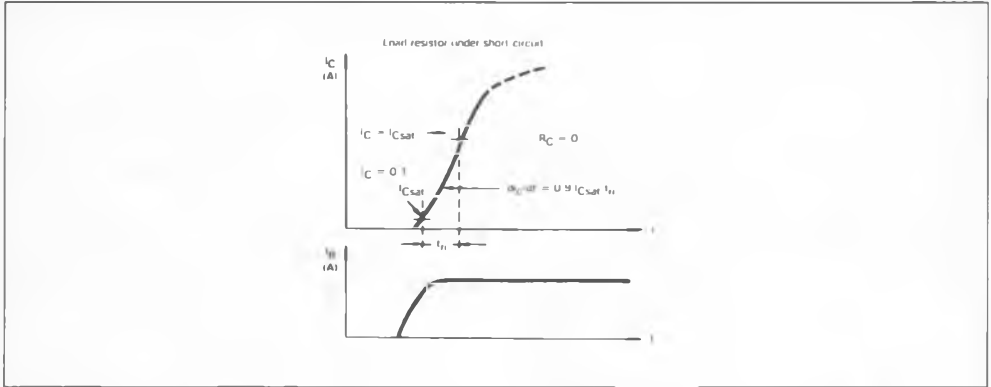


Figure 3 : Maximum Operating Conditions for Switching between Saturation and Cut off.

