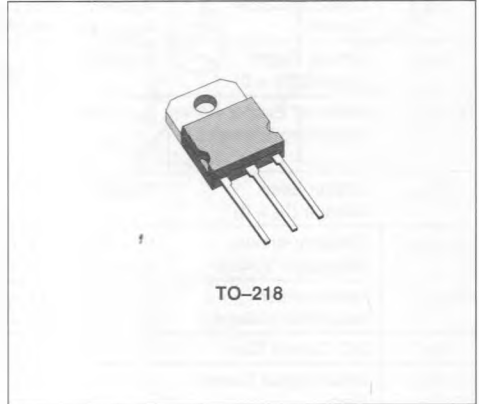


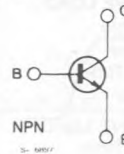


NPN HIGH VOLTAGE POWER TRANSISTORS

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



INTERNAL SCHEMATIC DIAGRAM



DESCRIPTION

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

ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter		2N6931	2N6932	Unit
V_{CEV}	Collector-emitter Voltage	$V_{BE} = -1.5V$	450	650	V
V_{CEX}	Collector-emitter Voltage		350	450	V
V_{CEO}	Collector-emitter Voltage	$I_B = 0$	300	400	V
V_{EBO}	Emitter-base Voltage	$I_C = 0$		8	V
I_C	Collector Current			10	A
I_{CM}	Collector Peak Current			15	A
I_B	Base Current			5	A
I_{BM}	Base Peak Current			7	A
I_E	Emitter Current			15	A
I_{EM}	Emitter Peak Current			22	A
P_{Tot}	Total Dissipation at $T_c < 25^\circ C$			150	W
T_{sig}	Storage Temperature			- 65 to 150	$^\circ C$
T_j	Max. Operating Junction Temperature			150	$^\circ C$

THERMAL DATA

$R_{th(j-case)}$	Thermal Resistance Junction-case	Max	0.83	$^{\circ}\text{C}/\text{W}$
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	$V_{CE} = V_{CEV}$ $V_{BE} = -1.5\text{V}$ $V_{CE} = V_{CEV}$ $V_{BE} = -1.5\text{V}$ $T_c = 100^{\circ}\text{C}$			0.1 1	mA mA
I_{EBO}	Emitter Cutoff Current ($I_C = 0$)	$V_{EB} = 8\text{V}$			2	mA
$V_{CEO(sus)}^*$	Collector Emitter Sustaining Voltage	$I_C = 0.2\text{A}$ $L = 25\text{mH}$ for 2N6931 for 2N6932	300 400			V V
V_{EBO}	Emitter-base Voltage ($I_C = 0$)	$I_E = 50\text{mA}$	8			V
$V_{CE(sat)}^*$	Collector-emitter Saturation Voltage	$I_C = 10\text{A}$ $I_B = 2\text{A}$ $I_C = 10\text{A}$ $I_B = 2\text{A}$ $T_c = 100^{\circ}\text{C}$			1 2	V V
$V_{BE(sat)}^*$	Base-emitter saturation Voltage	$I_C = 10\text{A}$ $I_B = 2\text{A}$ $I_C = 10\text{A}$ $I_B = 2\text{A}$ $T_c = 100^{\circ}\text{C}$			1.5 1.5	V V
h_{FE}^*	DC Current Gain	$I_C = 10\text{A}$ $V_{CE} = 3\text{V}$	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	$V_{CB} = 10\text{V}$ $f = 1\text{MHz}$	80		300	pF
t_d t_r t_s t_f	RESISTIVE LOAD Delay Time Rise Time Storage Time Fall Time	$V_{CC} = 300\text{V}$ $I_C = 10\text{A}$ $R_C = 30\Omega$ $I_{B1} = -I_{B2} = 2\text{A}$ $V_{BB} = -5\text{V}$ $t_p = 30\mu\text{s}$ See fig. 1			0.1 0.7 2.5 0.5	μs μs μs μs
t_s t_f t_c	INDUCTIVE LOAD Storage Time Fall Time Crossover Time	$V_{CC} = 50\text{V}$ $I_C = 10\text{A}$ $L_C = 150\mu\text{H}$ $I_{B1} = -I_{B2} = 2\text{A}$ $R_{BB} = 2.2\Omega$ $V_{clamp} = V_{CEX}$ $T_c = 100^{\circ}\text{C}$ See fig. 1			3.5 0.4 0.8	μs μs μs
di_c/dt	Turn-on Current Slope	$V_{CC} = 300\text{V}$ $I_B = 3\text{A}$ $R_C = 0$ $t_p = 3\mu\text{s}$ See fig. 2	50			$\text{A}/\mu\text{s}$
V_{CEX}	Collector-emitter Sustaining Voltage	$V_{CC} = 50\text{V}$ $I_C = 10\text{A}$ $L_C = 150\mu\text{H}$ $I_{B1} = -I_{B2} = 2\text{A}$ $R_{BB} = 2.2\Omega$ $V_{clamp} = V_{CEX}$ $T_c = 100^{\circ}\text{C}$ See fig. 3 for 2N6931 for 2N6932	350 450			V V

* Pulsed : Pulse duration = 300 μs , duty cycle = 2%

Figure 1 : Switching Time Measurements.

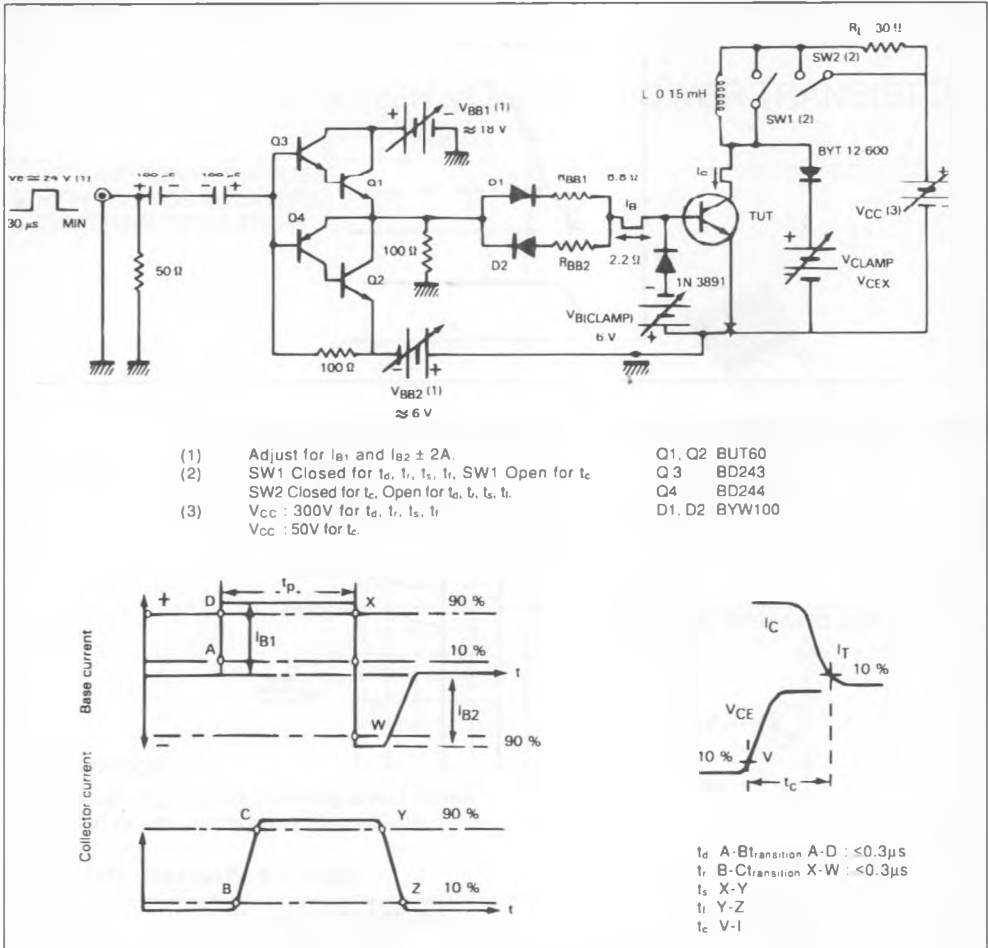


Figure 2 : Turn-on Switching Waveforms.

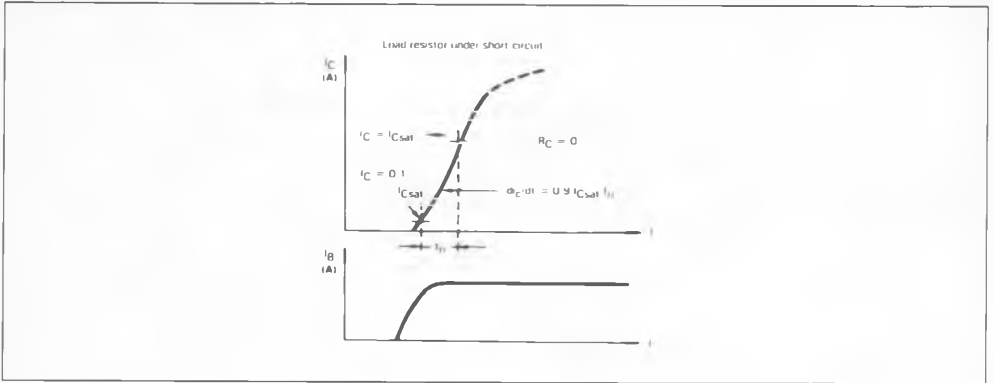


Figure 3 : Maximum Operating Conditions for Switching between Saturation and Cut off.

