



SGS-THOMSON
MICROELECTRONICS

TIP51/TIP52
TIP53/TIP54

S G S-THOMSON

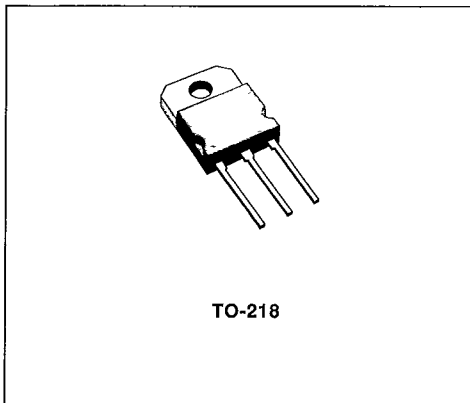
30E D

HIGH VOLTAGE POWER SWITCH

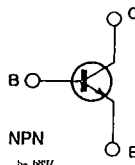
DESCRIPTION

The TIP51, TIP52, TIP53 and TIP54 are silicon multipleptaxial mesa NPN transistors in SOT-93 plastic package.

They are intended for high voltage, fast switching industrial and consumer applications.



INTERNAL SCHEMATIC DIAGRAM



ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value				Unit
		TIP51	TIP52	TIP53	TIP54	
V_{CES}	Collector-emitter Voltage ($V_{BE} = 0$)	350	400	450	500	V
V_{CEO}	Collector-emitter Voltage ($I_B = 0$)	250	300	350	400	V
V_{EBO}	Emitter-base Voltage ($I_C = 0$)	5				V
I_C	Collector Current	3				A
I_{CM}	Collector Peak Current	5				A
I_B	Base Current	0.6				A
P_{tot}	Total Power Dissipation at $T_{case} \leq 25^\circ C$	100				W
T_{stg}	Storage Temperature	- 65 to 150				$^\circ C$
T_J	Junction Temperature	150				$^\circ C$

THERMAL DATA

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$R_{th\ j-case}$	Thermal Resistance Junction-case	Max.	1.25	°C/W
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T-33-13

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

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_{CES}	Collector Cutoff Current ($V_{BE} = 0$)	for TIP51 $V_{CE} = 350\text{ V}$ for TIP52 $V_{CE} = 400\text{ V}$ for TIP53 $V_{CE} = 450\text{ V}$ for TIP54 $V_{CE} = 500\text{ V}$			1 1 1 1	mA mA mA mA
I_{CEO}	Collector Cutoff Current ($I_B = 0$)	for TIP51 $V_{CE} = 150\text{ V}$ for TIP52 $V_{CE} = 200\text{ V}$ for TIP53 $V_{CE} = 250\text{ V}$ for TIP54 $V_{CE} = 300\text{ V}$			1 1 1 1	mA mA mA mA
I_{EBO}	Emitter Cutoff Current ($I_C = 0$)	$V_{EB} = 5\text{ V}$			1	mA
$V_{CEO(sus)}^*$	Collector-emitter Sustaining Voltage ($I_B = 0$)	$I_C = 30\text{ mA}$ for TIP51 for TIP52 for TIP53 for TIP54	250 300 350 400			V V V V
$V_{CE(sat)}^*$	Collector-emitter Saturation Voltage	$I_C = 3\text{ A}$ $I_B = 0.6\text{ A}$			1.5	V
V_{BE}^*	Base-emitter	$I_C = 3\text{ A}$ $V_{CE} = 10\text{ V}$			1.5	V
h_{FE}^*	DC current Gain	$I_C = 0.3\text{ A}$ $V_{CE} = 10\text{ V}$ $I_C = 3\text{ A}$ $V_{CE} = 10\text{ V}$	30 10		150	
h_{fe}	Small Signal Current Gain	$I_C = 0.2\text{ A}$; $V_{CE} = 10\text{ V}$; $f = 1\text{ KHz}$ $I_C = 0.2\text{ A}$; $V_{CE} = 10\text{ V}$; $f = 1\text{ MHz}$	30 2.5			
$E_{s/b}$	Second Breakdown Unclamped Energy	$V_{BE} = 20\text{ V}$ $R_{BE} = 100\text{ }\Omega$ $L = 30\text{ mH}$	100			mJ
t_{on}	Turn-on Time	$I_C = 1\text{ A}$ $I_{B1} = 100\text{ mA}$ $V_{CC} = 200\text{ V}$		0.2		μs
t_{off}	Turn-off Time	$I_C = 1\text{ A}$ $I_{B1} = -I_{B2} = 100\text{ mA}$ $V_{CC} = 200\text{ V}$		2		μs

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

Safe Operating Areas.

