SGS-THOMSON
MICROELECTRONICS

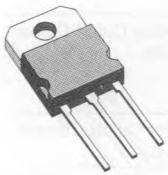
TIP51/TIP52
TIP53/TIP54

HIGH VOLTAGE POWER SWITCH

DESCRIPTION

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

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



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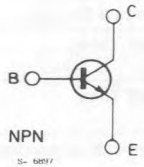
INTERNAL SCHEMATIC DIAGRAM



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 $T_{case} \leq 25$ °C	100				W
T_{stg}	Storage Temperature	– 65 to 150				°C
T_j	Junction Temperature	150				°C

THERMAL DATA

$R_{th\ j\text{-}case}$	Thermal Resistance Junction-case	Max	1.25	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25 °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 V			1	mA
		for **TIP52**	V_{CE} = 400 V			1	mA
		for **TIP53**	V_{CE} = 450 V			1	mA
		for **TIP54**	V_{CE} = 500 V			1	mA
I_{CEO}	Collector Cutoff Current (I_B = 0)	for **TIP51**	V_{CE} = 150 V			1	mA
		for **TIP52**	V_{CE} = 200 V			1	mA
		for **TIP53**	V_{CE} = 250 V			1	mA
		for **TIP54**	V_{CE} = 300 V			1	mA
I_{EBO}	Emitter Cutoff Current (I_C = 0)	V_{EB} = 5 V				1	mA
$V_{CEO(sus)}$*	Collector-emitter Sustaining Voltage (I_B = 0)	I_C = 30 mA	for **TIP51**	250			V
			for **TIP52**	300			V
			for **TIP53**	350			V
			for **TIP54**	400			V
$V_{CE(sat)}$*	Collector-emitter Saturation Voltage	I_C = 3 A	I_B = 0.6 A			1.5	V
V_{BE}*	Base-emitter	I_C = 3 A	V_{CE} = 10 V			1.5	V
h_{FE}*	DC current Gain	I_C = 0.3 A	V_{CE} = 10 V	30		150	
		I_C = 3 A	V_{CE} = 10 V	10			
h_{fe}	Small Signal Current Gain	I_C = 0.2 A ; V_{CE} = 10 V ; f = 1 KHz		30			
		I_C = 0.2 A ; V_{CE} = 10 V ; f = 1 MHz		2.5			
$E_{s/b}$	Second Breakdown Unclamped Energy	V_{BE} = 20 V L = 30 mH	R_{BE} = 100 Ω	100			mJ
t_{on}	Turn-on Time	I_C = 1 A V_{CC} = 200 V	I_{B1} = 100 mA		0.2		µs
t_{off}	Turn-off Time	I_C = 1 A V_{CC} = 200 V	I_{B1} = − I_{B2} = 100 mA		2		µs

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

Safe Operating Areas.