TIP51
TIP52
TIP53
TIP54

MULTIEPITAXIAL MESA NPN

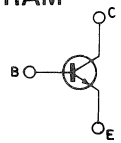
HIGH VOLTAGE POWER SWITCH

The TIP51, TIP52, TIP53, TIP54 are silicon multiepitaxial mesa NPN transistors in SOT-93 plastic package.
They are intended for high voltage, fast switching industrial and consumer applications.

ABSOLUTE MAXIMUM RATINGS

		TIP51	TIP52	TIP53	TIP54
V_{CES}	Collector-emitter voltage (V_{BE} = 0)	350V	400V	450V	500V
V_{CEO}	Collector-emitter voltage (I_B = 0)	250V	300V	350V	400V
V_{EBO}	Emitter-base voltage (I_C = 0)	5V			
I_C	Collector current	3V			
I_{CM}	Collector peak current	5A			
I_B	Base current	0.6A			
P_{tot}	Total power dissipation at $T_{case} \leqslant 25°C$	100W			
T_{stg}	Storage temperature	-65 to 150°C			
T_j	Junction temperature	150°C			

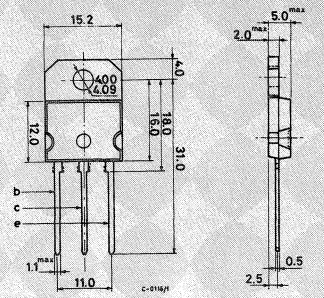
INTERNAL SCHEMATIC DIAGRAM



MECHANICAL DATA

Dimensions in mm

Collector connected to tab.



(sim. to TO-218) SOT-93

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)

Parameter		Test conditions		Min.	Typ.	Max.	Unit
I_{CES}	Collector-cutoff current (V_{BE} = 0)	for **TIP51**	V_{CE} = 350V			1	mA
		for **TIP52**	V_{CE} = 400V			1	mA
		for **TIP53**	V_{CE} = 450V			1	mA
		for **TIP54**	V_{CE} = 500V			1	mA
I_{CEO}	Collector cutoff current (I_B = 0)	for **TIP51**	V_{CE} = 150V			1	mA
		for **TIP52**	V_{CE} = 200V			1	mA
		for **TIP53**	V_{CE} = 250V			1	mA
		for **TIP54**	V_{CE} = 300V			1	mA
I_{EBO}	Emitter cutoff current (I_C = 0)	V_{EB} = 5V				1	mA
$V_{CEO(sus)}$*	Collector-emitter sustaining voltage (I_B = 0)	I_C = 30mA	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 = 3A	I_B = 0.6A			1.5	V
V_{BE}*	Base-emitter	I_C = 3A	V_{CE} = 10V			1.5	V
h_{FE}*	DC current gain	I_C = 0.3A	V_{CE} = 10V	30		150	–
		I_C = 3A	V_{CE} = 10V	10			
h_{fe}	Small signal current gain	I_C=0.2A; V_{CE}=10V; f=1KHz		30			–
		I_C=0.2A; V_{CE}=10V; f=1MHz		2.5			–

ELECTRICAL CHARACTERISTICS (continued)

Parameter		Test conditions	Min. Typ. Max.	Unit
$E_{s/b}$	Second breakdown Un clamped energy	$V_{BE} = 20V$ $R_{BE} = 100\Omega$ $L = 30mH$	100	mJ
t_{on}	Turn-on time	$I_C = 1A$ $I_{B1} = 100mA$ $V_{CC} = 200V$	0.2	μs
t_{off}	Turn-off time	$I_C = 1A$ $I_{B1} = -I_{B2} = 100mA$ $V_{CC} = 200V$	2	μs

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

Safe operating areas