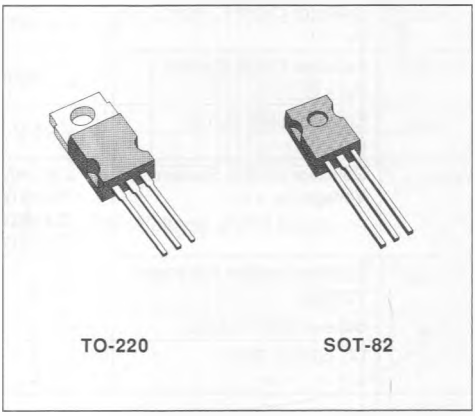
SGS-THOMSON MICROELECTRONICS

TIP/SGS110-111-112
TIP/SGS115-116-117

POWER DARLINGTONS

DESCRIPTION

The TIP110, TIP111, TIP112 and SGS110, SGS111, SGS112 are silicon epitaxial-base NPN transistors in monolithic Darlington configuration respectively in TO-220 and SOT-82 plastic package. They are intended for use in medium power linear and switching applications. The complementary PNP types are the TIP115, TIP116, TIP117 and SGS115, SGS116, SGS117 respectively.



INTERNAL SCHEMATIC DIAGRAMS

ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	NPN NPN PNP PNP	Value TIP110 SGS110 TIP115 SGS115	 TIP111 SGS111 TIP116 SGS116	 TIP112 SGS112 TIP117 SGS117	Unit
V_{CBO}	Collector-base Voltage (I_E = 0)		60	80	100	V
V_{CEO}	Collector-emitter Voltage (I_B = 0)		60	80	100	V
V_{EBO}	Emitter-base Voltage (I_C = 0)		5			V
I_C	Collector Current		2			A
I_{CM}	Collector Peak Current		4			A
I_B	Base Current		50			mA
P_{tot}	Total Power Dissipation at $T_{case} \leq 25$ °C $T_{amb} \leq 25$°C		50 2			W W
T_{stg}	Storage Temperature		− 65 to 150			°C
T_j	Junction Temperature		150			°C

For PNP types voltage and current values are negative.

THERMAL DATA

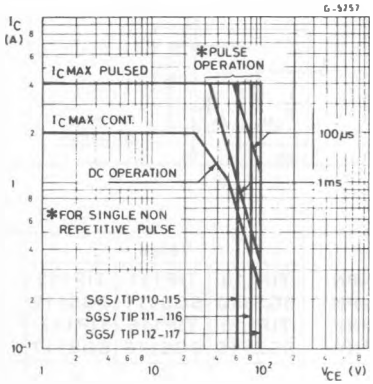
$R_{th\ j\text{-}case}$	Thermal Resistance Junction-case	Max	2.5	°C/W
$R_{th\ j\text{-}amb}$	Thermal Resistance Junction-ambient	Max	62.5	°C/W

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

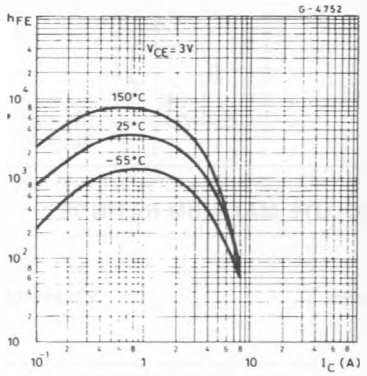
Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Unit
I_{CEO}	Collector Cutoff Current (I_B = 0)	V_{CE} = Half Rated V_{CEO}				2	mA
I_{CBO}	Collector Cutoff Current (I_E = 0)	V_{CB} = Rated V_{CBO}				1	mA
I_{EBO}	Emitter Cutoff Current (I_C = 0)	V_{EB} = 5 V				2	mA
$V_{CEO(sus)}$*	Collector-emitter Sustaining Voltage (I_B = 0)	I_C = 30 mA for **TIP/SGS110** and **TIP/SGS115** for **TIP/SGS111** and **TIP/SGS116** for **TIP/SGS112** and **TIP/SGS117**		 60 80 100			 V V V
$V_{CE(sat)}$*	Collector-emitter Saturation Voltage	I_C = 2 A	I_B = 8 mA			2.5	V
V_{BE}*	Base-emitter Voltage	I_C = 2 A	V_{CE} = 4 V			2.8	V
h_{FE}*	DC current Gain	I_C = 1 A I_C = 2 A	V_{CE} = 4 V V_{CE} = 4 V	1000 500			

* Pulsed : pulse duration = 300 µs, duty cycle < 2 %.
For PNP types voltage and current values are negative.

Safe Operating Areas.



DC Current Gain (NPN types).



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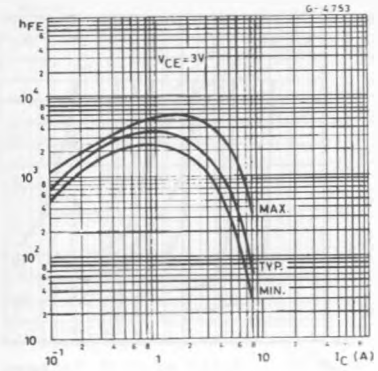

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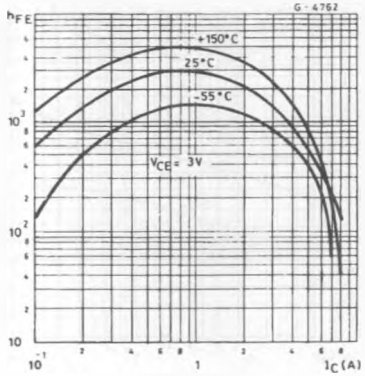

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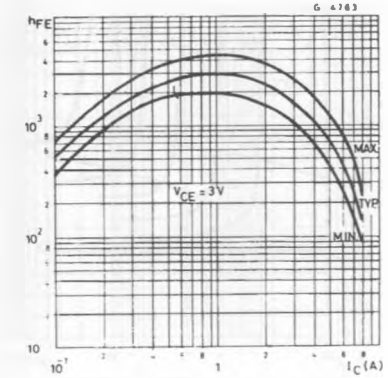
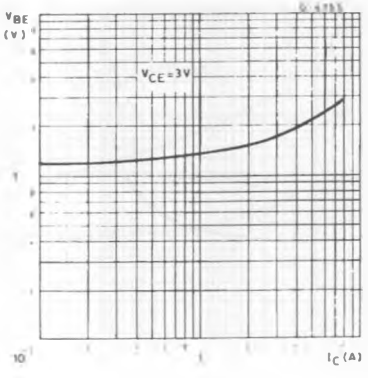
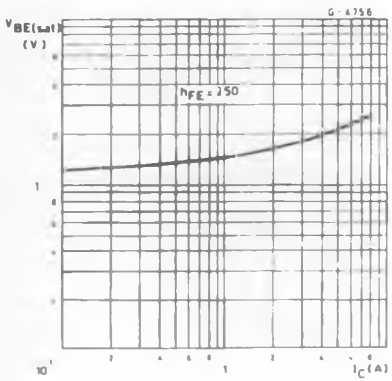


Base-emitter Voltage (NPN types).



Base-emitter Saturation Voltage (NPN types).



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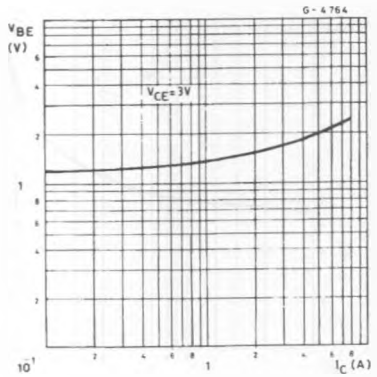

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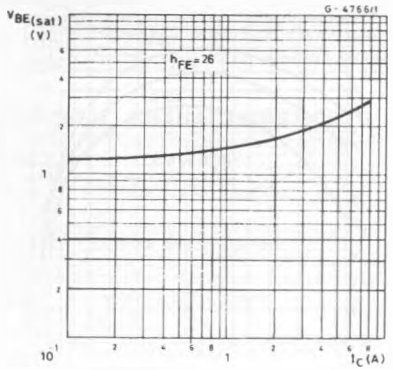
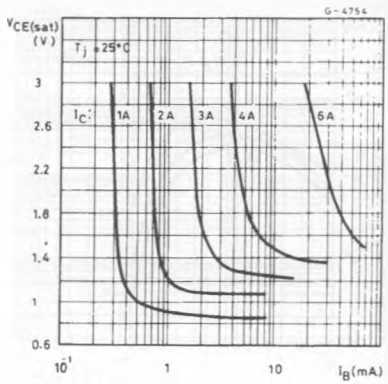


Collector-emitter Saturation Voltage (NPN types).



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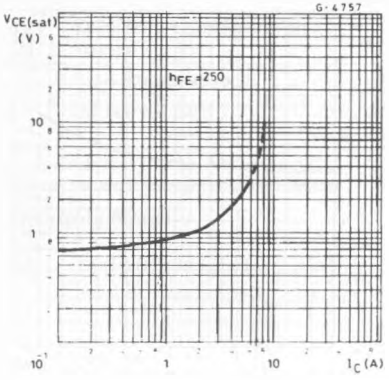

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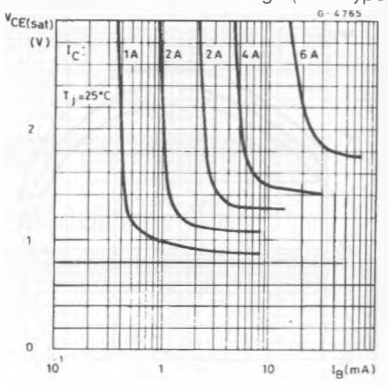

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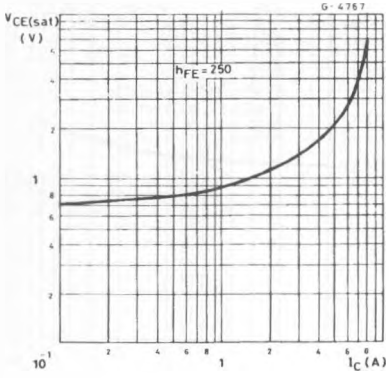
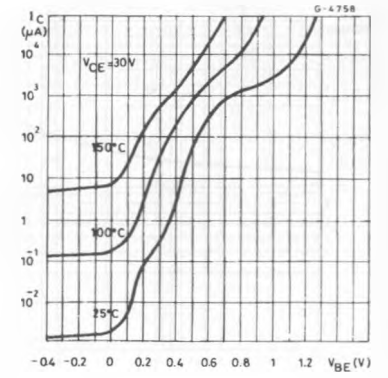


Collector Cutoff Current (NPN types).



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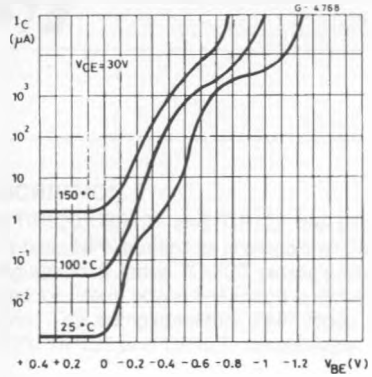
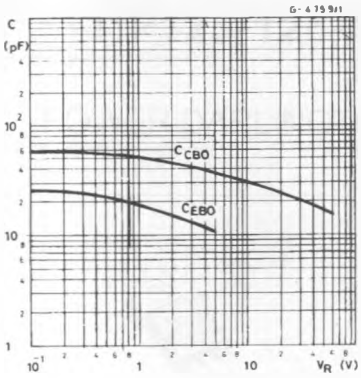


Capacitances (NPN types).



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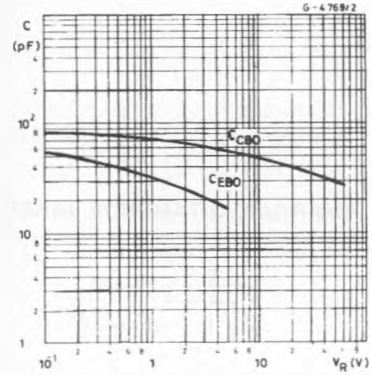
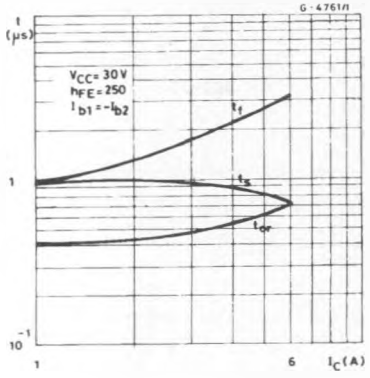
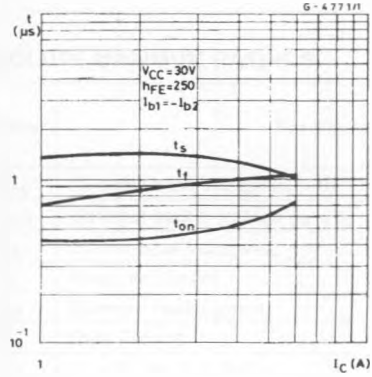


Saturated Switching Characteristics (NPN types).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