



SANYO SEMICONDUCTOR

NPN	PNP
TIP140	TIP145
TIP141	TIP146
TIP142	TIP147

DARLINGTON COMPLEMENTARY SILICON POWER TRANSISTORS

60-80-100 VOLTS, 10 AMPERE

HIGH CURRENT GAIN $h_{FE} = 4000$ typ. @ 3V, 5A
LOW SATURATION VOLTAGE $V_{CE(SAT)} = 1.0V$ typ. @ 5A
MONOLITHIC CONSTRUCTION WITH BUILT-IN
(1) BASE-EMITTER RESISTORS AND
(2) COLLECTOR-EMITTER DIODE

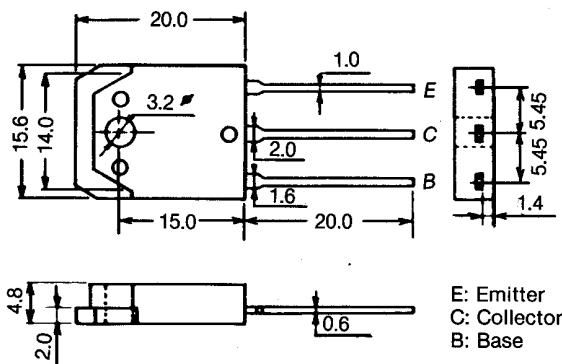
ABSOLUTE MAXIMUM RATINGS @ $T_a = 25^\circ C$

RATING	SYMBOL	TIP140, TIP145	TIP141, TIP146	TIP142, TIP147	UNIT
COLLECTOR-EMITTER VOLTAGE	V _{CEO}	60	80	100	V _{dc}
COLLECTOR-BASE VOLTAGE	V _{CB}	60	80	100	V _{dc}
EMITTER-BASE VOLTAGE	V _{EB}	←———— 5.0 —————→			V _{dc}
COLLECTOR CURRENT- CONTINUOUS PEAK	I _C	←———— 10 —————→			A _{dc}
		←———— 15 —————→			
TOTAL POWER DISSIPATION @ T _C = 25 °C	P _D	←———— 125 —————→			W
TOTAL POWER DISSIPATION @ T _A = 25 °C	P _D	←———— 3.5 —————→			W
OPERATING AND STORAGE JUNCTION TEMPERATURE RANGE	T _J , T _{stg}	←—— - 55 to + 150 ———→			°C

OUTLINE DIMENSION

JEDEC: TO-3P

UNIT: MM

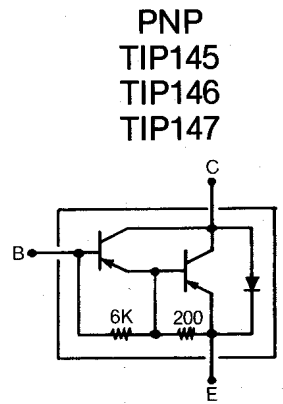
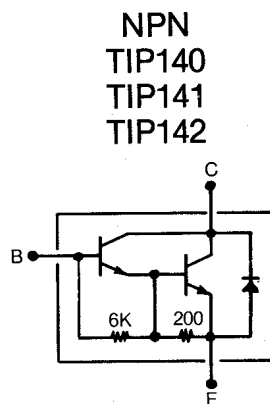
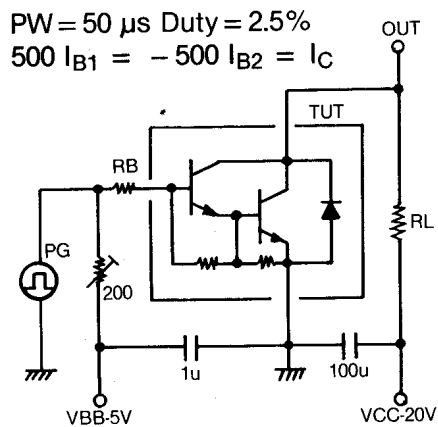


ELECTRICAL CHARACTERISTICS @ Ta = 25°C

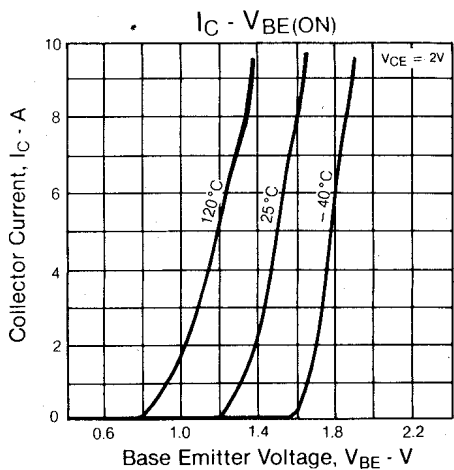
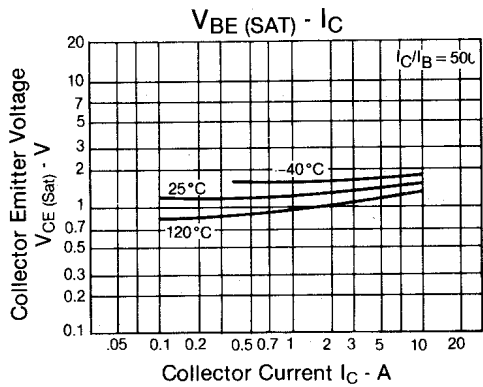
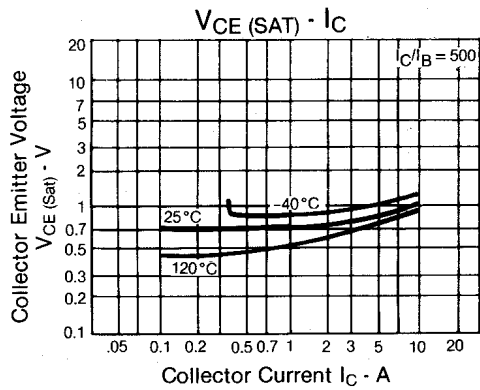
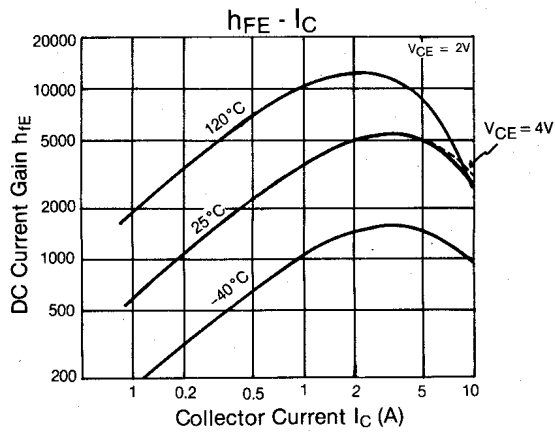
CHARACTERISTIC	SYMBOL	MIN	MAX	UNIT
COLLECTOR-EMITTER SUSTAINING VOLTAGE ($I_C = 30 \text{ mA}$, $I_B = 0$) TIP140, TIP145 TIP141, TIP146 TIP142, TIP147	$V_{CE(SUS)}$	60 80 100	— — —	Vdc
COLLECTOR CUTOFF CURRENT ($V_{CE} = 30 \text{ Vdc}$, $I_B = 0$) ($V_{CE} = 40 \text{ Vdc}$, $I_B = 0$) ($V_{CE} = 50 \text{ Vdc}$, $I_B = 0$) TIP140, TIP145 TIP141, TIP146 TIP142, TIP147	I_{CEO}	— — —	2.0 2.0 2.0	mA
COLLECTOR CUTOFF CURRENT ($V_{CB} = 60 \text{ Vdc}$, $I_E = 0$) ($V_{CB} = 80 \text{ Vdc}$, $I_E = 0$) ($V_{CB} = 100 \text{ Vdc}$, $I_E = 0$) TIP140, TIP145 TIP141, TIP146 TIP142, TIP147	I_{CBO}	— — —	1.0 1.0 1.0	mA
EMITTER CUTOFF CURRENT ($V_{BE} = 5.0 \text{ Vdc}$, $I_C = 0$)	I_{EBO}	—	2.0	mA mA
DC CURRENT GAIN ($I_C = 5.0 \text{ A}$, $V_{CE} = 4.0 \text{ Vdc}$) ($I_C = 10.0 \text{ A}$, $V_{CE} = 4.0 \text{ Vdc}$)	h_{FE}	1000 500	— —	—
COLLECTOR-EMITTER SATURATION VOLTAGE ($I_C = 5.0 \text{ A}$, $I_B = 10 \text{ mA}$) ($I_C = 10.0 \text{ A}$, $I_B = 40 \text{ mA}$)	$V_{CE(SAT)}$	— —	2.0 3.0	Vdc
BASE-EMITTER ON VOLTAGE ($I_C = 10.0 \text{ A}$, $V_{CE} = 4.0 \text{ Vdc}$)	$V_{BE(ON)}$	—	3.0	Vdc
GAIN BANDWIDTH PRODUCT ($I_C = 5.0 \text{ A}$, $V_{CE} = 5.0 \text{ V}$)	f_T	20 typ.		MHz

SWITCHING TIME TEST CIRCUIT

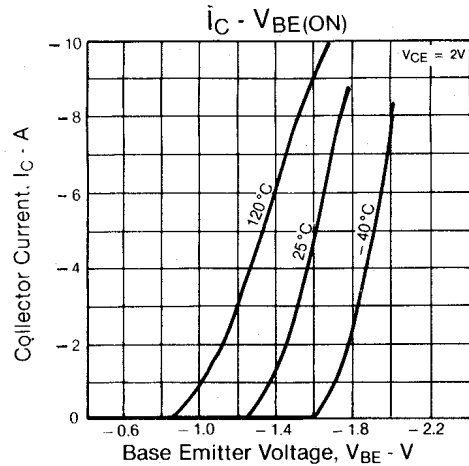
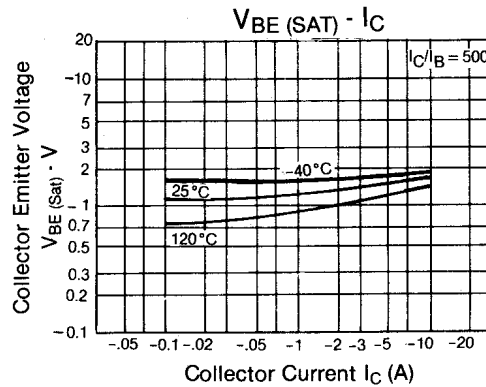
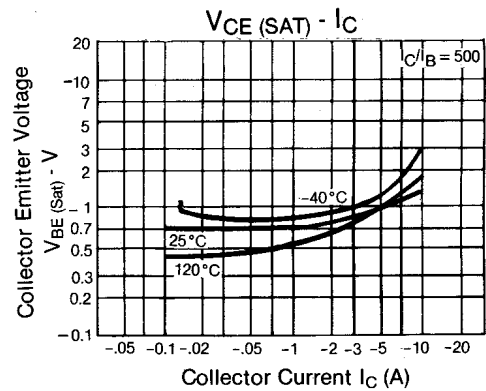
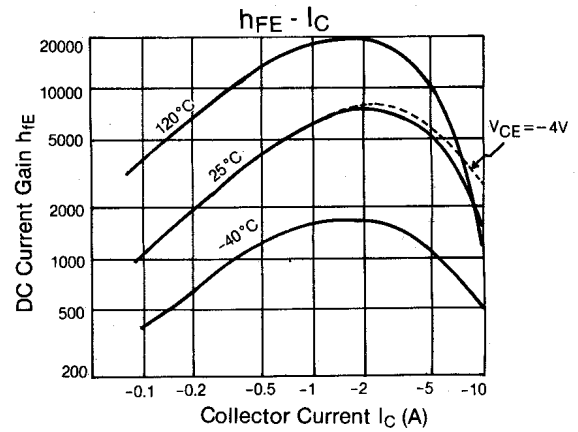
DARLINGTON SCHEMATIC



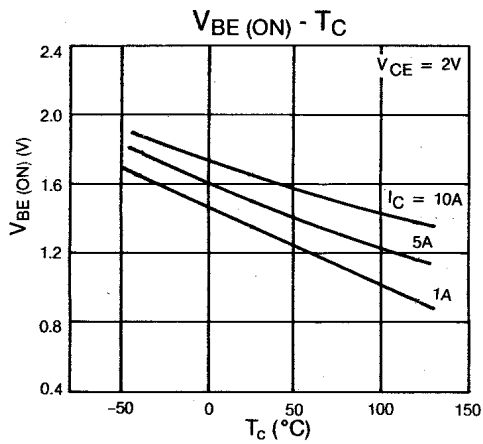
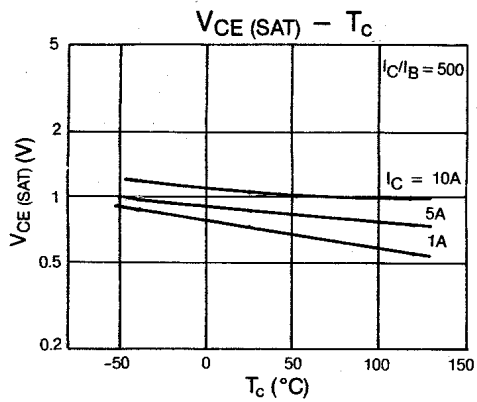
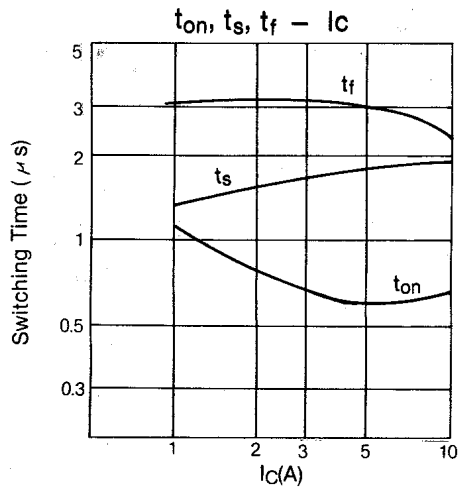
NPN
TIP 140, TIP 141, TIP 142



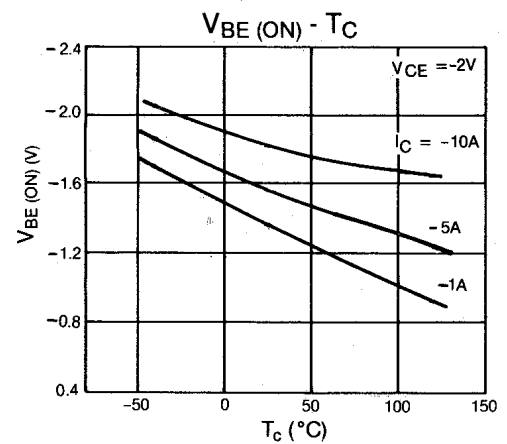
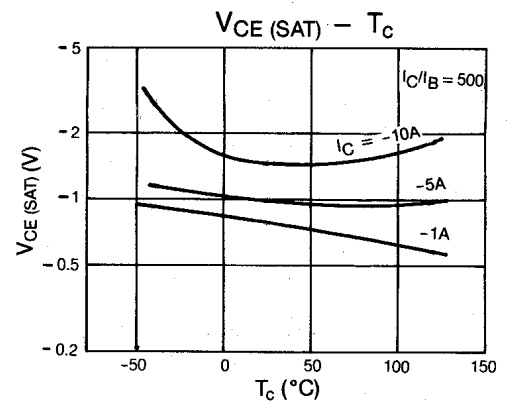
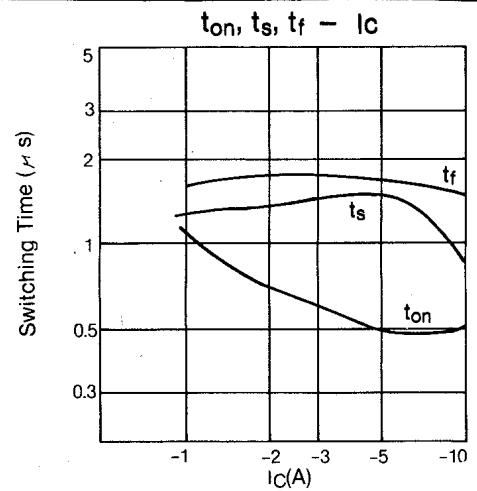
PNP
TIP 145, TIP 146, TIP 147



NPN
TIP 140, TIP 141, TIP 142



PNP
TIP 145, TIP 146, TIP 147



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