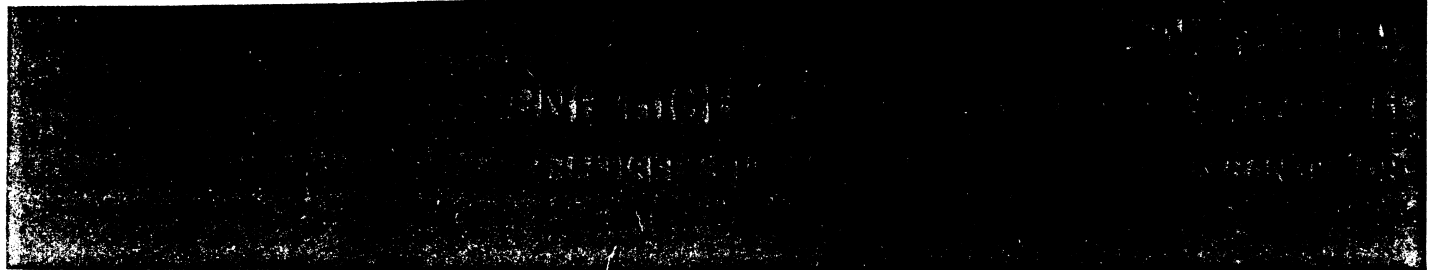


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- **FAST SWITCHING** -- $t_{on} = 20$ ns (MAX)
-- $t_{off} = 25$ ns (MAX)
-- $\tau_s = 20$ ns (MAX)
- **HIGH FREQUENCY** -- $f_T = 800$ MHz (MIN)
- **LOW CAPACITANCE** -- $C_{obo} = 4.5$ pF (MAX)
- **LOW SATURATION VOLTAGE** -- $V_{CE(SAT)} = 0.13$ V (MAX) @ $I_C = 10$ mA

ABSOLUTE MAXIMUM RATINGS [Note 1]

Maximum Temperatures

- Storage Temperature
- Operating Junction Temperature
- Lead Temperature (Soldering, 60 second time limit)

-65°C to +200°C
200°C Maximum
300°C Maximum

Maximum Power Dissipation

- Total Dissipation at 25°C Case Temperature [Notes 2 and 3]
- at 100°C Case Temperature [Notes 2 and 3]
- at 25°C Ambient Temperature [Notes 2 and 3]

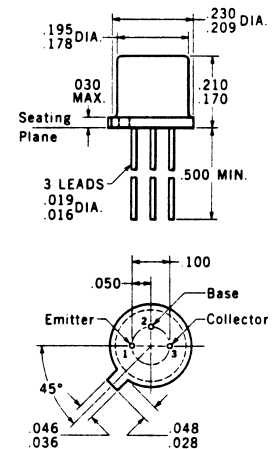
1.2 Watts
0.72 Watt
0.36 Watt

Maximum Voltages

- V_{CBO} Collector to Base Voltage
- V_{CEO} Collector to Emitter Voltage [Note 4]
- V_{EBO} Emitter to Base Voltage

-12 Volts
-12 Volts
-4.5 Volts

PHYSICAL DIMENSIONS in accordance with JEDEC (TO-18) outline



NOTES: All dimensions in inches
Leads are gold-plated kovar
Collector internally connected to case
Package weight is 0.44 gram

ELECTRICAL CHARACTERISTICS (25°C Free Air Temperature Unless Otherwise Noted)

Symbol	Characteristic	Min.	Typ.	Max.	Units	Test Conditions
t_{on}	Turn On Time [Note 6, Figure 1]		10	20	ns	$I_C \approx 30$ mA $I_{B1} \approx 3.0$ mA
t_{off}	Turn Off Time [Note 6, Figure 1]		15	25	ns	$I_C \approx 30$ mA $I_{B1} \approx 3.0$ mA
t_{on}	Turn On Time [Note 6, Figure 2]		23	60	ns	$I_C \approx 30$ mA $I_{B1} \approx 1.5$ mA
t_{off}	Turn Off Time [Note 6, Figure 2]		13	35	ns	$I_C \approx 30$ mA $I_{B1} \approx 1.5$ mA
τ_s	Charge Storage Time Constant [Note 6, Figure 3]		15	20	ns	$I_C \approx I_{B1} \approx I_{B2} \approx 10$ mA
$V_{CE(sat)}$	Pulsed Collector-Emitter Saturation Voltage [Note 5]	-0.08	-0.13		Volts	$I_C = 10$ mA $I_B = 1.0$ mA
$V_{CE(sat)}$	Pulsed Collector-Emitter Saturation Voltage [Note 5]	-0.12	-0.19		Volts	$I_C = 30$ mA $I_B = 3.0$ mA
$V_{CE(sat)}$	Pulsed Collector-Emitter Saturation Voltage [Note 5]	-0.28	-0.45		Volts	$I_C = 100$ mA $I_B = 10$ mA
$V_{BE(sat)}$	Pulsed Base-Emitter Saturation Voltage [Note 5]	-0.78	-0.82	-0.92	Volts	$I_C = 10$ mA $I_B = 1.0$ mA
$V_{BE(sat)}$	Pulsed Base-Emitter Saturation Voltage [Note 5]	-0.85	-0.93	-1.15	Volts	$I_C = 30$ mA $I_B = 3.0$ mA
$V_{BE(sat)}$	Pulsed Base-Emitter Saturation Voltage [Note 5]	-1.0	-1.14	-1.5	Volts	$I_C = 100$ mA $I_B = 10$ mA
h_{fe}	High Frequency Current Gain ($f = 100$ MHz)	8.0	12			$I_C = 30$ mA $V_{CE} = -10$ V
C_{obo}	Output Capacitance		3.3	4.5	pF	$I_E = 0$ $V_{CB} = -5.0$ V
C_{ibo}	Input Capacitance		4.7	6.0	pF	$I_C = 0$ $V_{EB} = -0.5$ V
I_{CES}	Collector Reverse Current		0.29	50	nA	$V_{BE} = 0$ $V_{CE} = -10$ V

Additional Electrical Characteristics on page 2

NOTES:

- (1) These ratings are limiting values above which the serviceability of any individual semiconductor device may be impaired.
- (2) These are steady state limits. The factory should be consulted on applications involving pulsed or low duty cycle operations.
- (3) These ratings give a maximum junction temperature of 200°C and junction to case thermal resistance of 146°C/watt (derating factor of 6.85 mW/°C); junction to ambient thermal resistance of 486°C/watt (derating factor of 2.06 mW/°C).
- (4) This rating refers to a high current point where collector to emitter voltage is lowest. For more information send for Fairchild Publication APP-4/2.
- (5) Pulse Conditions: length = 300 μ s; duty cycle = 1%.

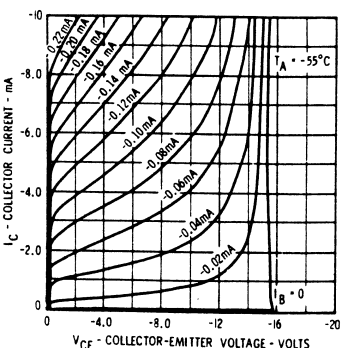
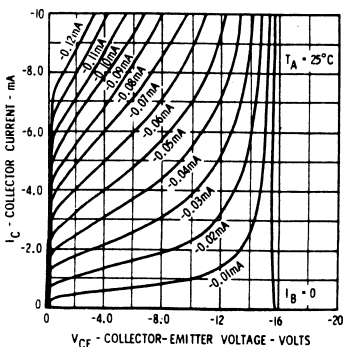
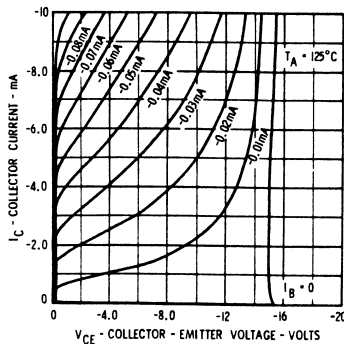
IP HIGH SPEED SATURATED SWITCH — DIFFUSED SILICON PLANAR — EPITAXIAL TRANSISTOR — 1975

ELECTRICAL CHARACTERISTICS (25°C Free Air Temperature Unless Otherwise Noted)

Symbol	Characteristic	Min.	Typ.	Max.	Units	Test Conditions
I_{CBO} (125°C)	Collector Cutoff Current		0.05	10	μA	$I_E = 0$ $V_{CE} = -10 V$
V_{CEO} (sust)	Collector-Emitter Sustaining Voltage [Notes 4 and 5]	-12			Volts	$I_C = 10 mA$ (pulsed) $I_E = 0$
BV_{CBO}	Collector-Base Breakdown Voltage	-12			Volts	$I_C = 10 \mu A$ $I_E = 0$
BV_{CES}	Collector-Emitter Breakdown Voltage	-12			Volts	$I_C = 10 \mu A$ $V_{BE} = 0$
BV_{EBO}	Emitter-Base Breakdown Voltage	-4.5			Volts	$I_C = 0$ $I_E = 100 \mu A$
h_{FE}	DC Pulse Current Gain [Note 5]	20	44			$I_C = 1.0 mA$ $V_{CE} = -0.5 V$
h_{FE}	DC Pulse Current Gain [Note 5]	30	53			$I_C = 10 mA$ $V_{CE} = -0.3 V$
h_{FE}	DC Pulse Current Gain [Note 5]	40	63	120		$I_C = 30 mA$ $V_{CE} = -0.5 V$
h_{FE}	DC Pulse Current Gain [Note 5]	30	55			$I_C = 100 mA$ $V_{CE} = -1.0 V$
$h_{FE} (-55^\circ C)$	DC Pulse Current Gain [Note 5]	20	38			$I_C = 30 mA$ $V_{CE} = -0.5 V$

TYPICAL COLLECTOR AND BASE CHARACTERISTICS*

ACTIVE REGION



SATURATION REGION

