SGS-THOMSON MICROELECTRONICS

2N4035

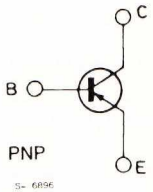
GENERAL PURPOSE AMPLIFIERS AND SWITCHES

DESCRIPTION

The 2N4035 is a silicon planar epitaxial PNP transistors in Jedec TO-18 metal case, primarily intended for small signal, low noise industrial applications.

TO-18

INTERNAL SCHEMATIC DIAGRAM



ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V_{CBO}	Collector-base Voltage ($I_E = 0$)	– 40	V
V_{CEO}	Collector-emitter Voltage ($I_B = 0$)	– 40	V
V_{EBO}	Emitter-base Voltage ($I_C = 0$)	– 5	V
I_C	Collector Current	– 100	mA
P_{tot}	Total Power Dissipation at $T_{amb} \leq 25$ °C at $T_{case} \leq 25$ °C	0.36 1	W W
T_{stg}, T_j	Storage and Junction Temperature	– 65 to 200	°C

THERMAL DATA

$R_{th\ j\text{-}case}$	Thermal Resistance Junction-case	Max	175	°C/W
$R_{th\ j\text{-}amb}$	Thermal Resistance Junction-ambient	Max	486	°C/W

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

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_{CES}	Collector Cutoff Current (V_{BE} = 0)	V_{CE} = − 30 V V_{CE} = − 30 V T_{amb} = 125 °C			− 15 − 15	nA µA
$V_{(BR)CBO}$	Collector-base Breakdown Voltage (I_E = 0)	I_C = − 10 µA	− 40			V
$V_{(BR)CES}$	Collector-emitter Breakdown Voltage (V_{BE} = 0)	I_C = − 10 µA	− 40			V
$V_{(BR)CEO}$*	Collector-Emitter Breakdown Voltage (I_B = 0)	I_C = − 10 mA	− 40			V
$V_{(BR)EBO}$	Emitter-Base Breakdown Voltage (I_C = 0)	I_E = − 10 µA	− 5			V
$V_{CE(sat)}$*	Collector-Emitter Saturation Voltage	I_C = − 1 mA I_B = − 0.1 mA I_C = − 10 mA I_B = − 1 mA I_C = − 50 mA I_B = − 5 mA			− 0.13 − 0.14 − 0.3	V V V
$V_{BE(sat)}$*	Base-Emitter Saturation Voltage	I_C = − 1 mA I_B = − 0.1 mA I_C = − 10 mA I_B = − 1 mA I_C = − 50 mA I_B = − 5 mA	 − 0.7		− 0.75 − 0.9 − 1.1	V V V
h_{FE}*	DC Current Gain	I_C = − 10 µA V_{CE} = − 1 V I_C = − 100 µA V_{CE} = − 1 V I_C = − 1 mA V_{CE} = − 1 V I_C = − 10 mA V_{CE} = − 1 V I_C = − 50 mA V_{CE} = − 1 V I_C = − 10 mA V_{CE} = − 1 V T_{amb} = − 55 °C	70 140 150 150 30 70		 300	
h_{fe}	Small Signal Current Gain	I_C = − 1 mA V_{CE} = − 10 V f = 1 kHz	150		450	
f_T	Transition Frequency	I_C = − 10 mA V_{CE} = − 20 V f = 100 MHz	450			MHz
C_{EBO}	Emitter-base Capacitance	I_C = 0 V_{EB} = − 0.5 V f = 1 MHz			5.5	pF
C_{CBO}	Collector-base Capacitance	I_E = 0 V_{CB} = − 10 V f = 1 MHz			3.5	pF
NF	Noise Figure	I_C = − 1 mA V_{CE} = − 5 V f = 100 MHz R_g = 100 Ω			6	dB
t_{on}	Turn-on Time	I_C = − 50 mA V_{CC} = − 30 V I_{B1} = − 5 mA			40	ns
t_{off}	Turn-off Time	I_C = − 50 mA V_{CC} = − 30 V I_{B1} = − I_{B2} = − 5 mA			150	ns
h_{ie}	Input Impedance	I_C = − 1 mA V_{CE} = − 10 V f = 1 kHz	4		12	kΩ

* Pulsed : pulse duration = 300 µs, duty cycle = 1 %.

ELECTRICAL CHARACTERISTICS (continued)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
h_{re}	Reverse Voltage Ratio	$I_C = -1$ mA $V_{CE} = -10$ V f = 1 kHz			$4x10^{-4}$	
h_{oe}	Output Admittance	$I_C = -1$ mA $V_{CE} = -10$ V f = 1 kHz	8		40	µS
$r_{bb'}C_{b'c}$	Feedback Time Constant	$I_C = -10$ mA $V_{CE} = -20$ V f = 80 MHz			40	ps