2N3133 thru 2N3136 (SILICON)

PNP silicon annular Star transistors for high-speed switching and DC to UHF amplifier applications.

CASE 31 (TO-5)
2N3133
2N3134

CASE 22 (TO-18)
2N3135
2N3136

Collector connected to case

MAXIMUM RATINGS

Rating	Symbol	2N3133 2N3134 (TO-5)	2N3135 2N3136 (TO-18)	Unit
Collector-Base Voltage	V_{CB}	50	50	Vdc
Collector-Emitter Voltage	V_{CEO}	35	35	Vdc
Emitter-Base Voltage	V_{EB}	4.0	4.0	Vdc
Collector Current	I_C	600	600	mA
Total Device Dissipation @25°C Case Temperature Derate Above 25°C	P_D	3 17.3	1.8 10.3	Watts mW/°C
Total Device Dissipation @25°C Ambient Temperature Derate Above 25°C	P_D	0.6 3.43	0.4 2.28	Watts mW/°C
Junction Temperature	T_J	-65 to +200		°C
Storage Temperature	T_{stg}	-65 to +200		°C

SWITCHING CHARACTERISTICS (At 25°C unless otherwise noted)

Characteristic	Symbol	Typ	Max	Unit
Turn-On Time (V_{CC} = 30 V, I_{CS} = 150 mA, I_{B1} = 15 mA)	t_{on}	26	75	ns
Turn-Off Time (V_{CC} = 6V, I_{CS} = 150 mA, I_{B1} = I_{B2} = 15 mA)	t_{off}	70	150	ns

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted)

Characteristic	Symbol	Min	Max	Unit
Collector Cutoff Current (V_{CB} = 30 Vdc, I_E = 0) (V_{CB} = 30 Vdc, I_E = 0, T_A = 150°C)	I_{CBO}	--- ---	0.05 30	μAdc
Collector Cutoff Current (V_{CE} = 30 V, V_{BE} = 0.5 V)	I_{CEX}	---	0.1	μAdc
Base Cutoff Current (V_{CE} = 30 V, V_{BE} = 0.5 V)	I_{BL}	---	0.1	μAdc
Collector-Base Breakdown Voltage (I_C = 10 μAdc, I_E = 0)	BV_{CBO}	50	---	Vdc
Collector-Emitter Breakdown Voltage [1] (I_C = 10 mAdc, I_B = 0)	BV_{CEO}	35	---	Vdc
Emitter-Base Breakdown Voltage (I_E = 10 μAdc, I_C = 0)	BV_{EBO}	4.0	---	Vdc
Collector Saturation Voltage [1] (I_C = 150 mAdc, I_B = 15 mAdc)	V_{CE} (sat)	---	0.6	Vdc
Base-Emitter Saturation Voltage [1] (I_C = 150 mAdc, I_B = 15 mAdc)	V_{BE} (sat)	---	1.5	Vdc
DC Forward Current Transfer Ratio (I_C = 1.0 mAdc, V_{CE} = 10 Vdc) 2N3133, 2N3135 2N3134, 2N3136 (I_C = 150 mAdc, V_{CE} = 10 Vdc) [1] 2N3133, 2N3135 2N3134, 2N3136	h_{FE}	 25 50 40 100	 --- --- 120 300	---
Output Capacitance (V_{CB} = 10 Vdc, I_E = 0, f = 100 kHz)	C_{ob}	---	10	pF
Input Capacitance (V_{BE} = 2 Vdc, I_C = 0, f = 100 kHz)	C_{ib}	---	40	pF
Current-Gain — Bandwidth Product (I_C = 50 mAdc, V_{CE} = 20 Vdc, f = 100 MHz)	f_T	200	---	MHz

[1] Pulse Test: Pulse Width ≤ 300 μs, duty cycle ≤ 2%