2N5058
2N5059

CASE 79-02, STYLE 1
TO-39 (TO-205AD)

GENERAL PURPOSE TRANSISTOR

NPN SILICON

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Refer to 2N3724 for graphs.

MAXIMUM RATINGS

Rating	Symbol	2N5058	2N5059	Unit
Collector-Emitter Voltage	V_{CEO}	300	250	Vdc
Collector-Base Voltage	V_{CBO}	300	250	Vdc
Emitter-Base Voltage	V_{EBO}	7.0	6.0	Vdc
Collector Current — Continuous	I_C	150		mAdc
Total Device Dissipation @ T_A = 25°C Derate above 25°C	P_D	1.0 6.67		Watt mW/°C
Total Device Dissipation @ T_C = 25°C Derate above 25°C	P_D	5.0 33.3		Watts mW/°C
Operating and Storage Junction Temperature Range	T_J, T_{stg}	−65 to +200		°C

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	$R_{\theta JC}$	30	°C/W
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$ (1)	150	°C/W

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

Characteristic		Symbol	Min	Max	Unit
OFF CHARACTERISTICS					
Collector-Emitter Breakdown Voltage (2) (I_C = 30 mAdc, I_B = 0)	 2N5058 2N5059	$V_{(BR)CEO}$	 300 250	 — —	Vdc
Collector-Base Breakdown Voltage (I_C = 100 μAdc, I_E = 0)	 2N5058 2N5059	$V_{(BR)CBO}$	 300 250	 — —	Vdc
Emitter-Base Breakdown Voltage (I_E = 100 μAdc, I_C = 0)	 2N5058 2N5059	$V_{(BR)EBO}$	 7.0 6.0	 — —	Vdc
Collector Cutoff Current (V_{CB} = 100 Vdc, I_E = 0) (V_{CB} = 100 Vdc, I_E = 0, T_A = +125°C)		I_{CBO}	— —	0.05 20	μAdc
Emitter Cutoff Current (V_{BE} = 5.0 Vdc, I_C = 0)		I_{EBO}	—	10	nAdc
ON CHARACTERISTICS (2)					
DC Current Gain (I_C = 5.0 mAdc, V_{CE} = 25 Vdc)	 2N5058 2N5059	h_{FE}	 10 10	 — —	—
(I_C = 30 mAdc, V_{CE} = 25 Vdc)	 2N5058 2N5059		 35 30	 150 150	
(I_C = 30 mAdc, V_{CE} = 25 Vdc, T_A = −55°C)	2N5058		10	—	
(I_C = 100 mAdc, V_{CE} = 25 Vdc)	 2N5058 2N5059		 35 30	 — —	
Collector-Emitter Saturation Voltage (I_C = 30 mAdc, I_B = 3.0 mAdc)		$V_{CE(sat)}$	—	1.0	Vdc
Base-Emitter Saturation Voltage (I_C = 30 mAdc, I_B = 3.0 mAdc)		$V_{BE(sat)}$	—	0.85	Vdc
Base-Emitter On Voltage (I_C = 30 mAdc, V_{CE} = 25 Vdc)		$V_{BE(on)}$	—	0.82	Vdc
SMALL-SIGNAL CHARACTERISTICS					
Current-Gain — Bandwidth Product (3) (I_C = 10 mAdc, V_{CE} = 25 Vdc, f = 20 MHz)		f_T	30	160	MHz
Collector-Base Capacitance (V_{CB} = 10 Vdc, I_E = 0, f = 1.0 MHz)		C_{cb}	—	10	pF
Emitter-Base Capacitance (V_{BE} = 0.5 Vdc, I_C = 0, f = 1.0 MHz)		C_{eb}	—	75	pF

(1) $R_{\theta JA}$ is measured with the device soldered into a typical printed circuit board.
(2) Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle ≤ 2.0%.
(3) f_T is defined as the frequency at which the $|h_{fe}|$ extrapolates to unity.