Absolute Maximum Ratings (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	50(-50)	V
Collector-Emitter Voltage	V_{CEO}	45(-45)	V
Emitter-Base Voltage	V_{EBO}	6.0(-5.0)	V
Collector Current	I_C	100 (-100)	mA

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 5)	P_D	300	mW
Thermal Resistance, Junction to Ambient (Note 5)	$R_{\theta JA}$	417	°C/W
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	°C

ESD Ratings (Note 6)

Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge - Human Body Model	ESD HBM	4,000	V	3A
Electrostatic Discharge - Machine Model	ESD MM	200	V	B

Notes: 5. For the device mounted on minimum recommended pad layout 1oz copper that is on a single-sided 1.6mm FR4 PCB; device is measured under still air conditions whilst operating in steady state condition.
6. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

Thermal Characteristics and Derating Information

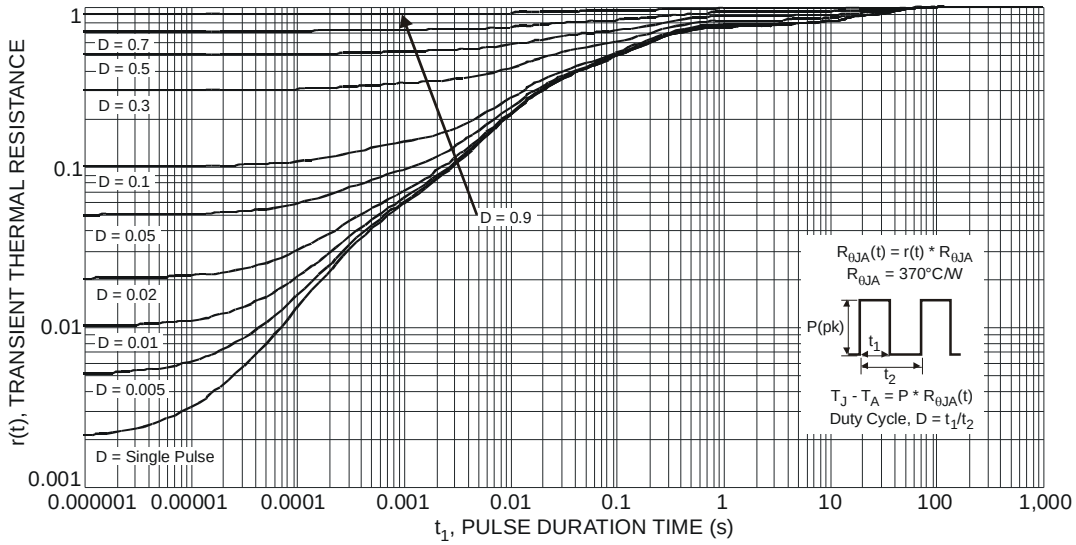


Fig. 1 Transient Thermal Response

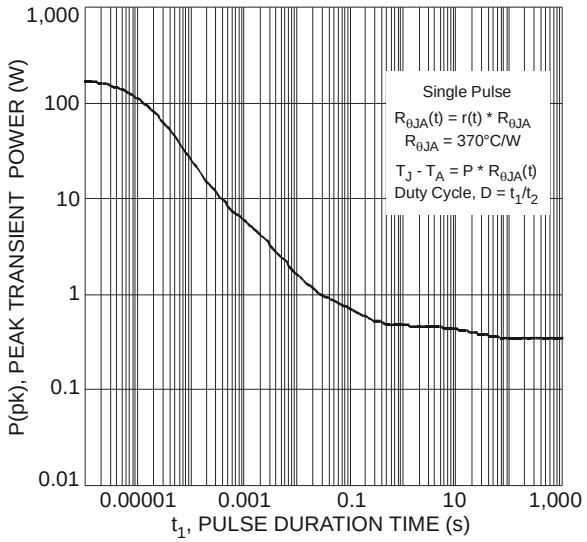


Fig. 2 Single Pulse Maximum Power Dissipation

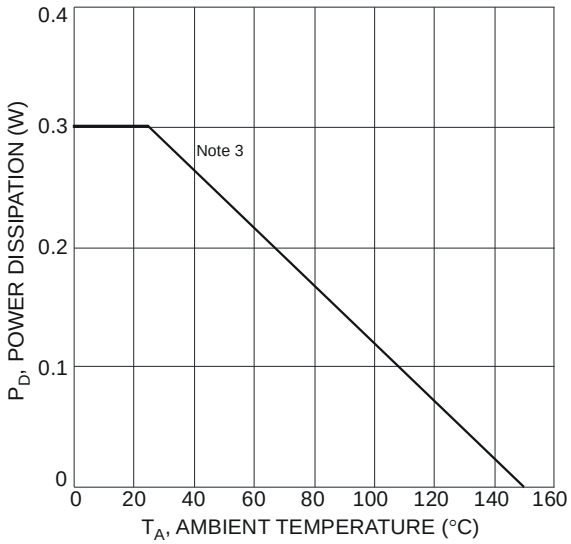


Fig. 3 Power Dissipation vs. Ambient Temperature

Electrical Characteristics – Q1 NPN Transistor (@T_A = +25°C, unless otherwise specified.)

Characteristic (Note 7)	Symbol	Min	Typical	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV_{CBO}	50	150	-	V	I_C = 10µA, I_B = 0
Collector-Emitter Breakdown Voltage	BV_{CES}	50	150	-	V	I_C = 10µA, I_B = 0
Collector-Emitter Breakdown Voltage	BV_{CEO}	45	65	-	V	I_C = 1mA, I_B = 0
Emitter-Base Breakdown Voltage	BV_{EBO}	6	8.35	-	V	I_E = 1µA, I_C = 0
Collector-Base Cut-Off Current	I_{CBO}	-	-	15	nA	V_{CB} = 30V
DC Current Gain	h_{FE}	- 200	220 300	- 470	-	I_C = 10µA, V_{CE} = 5V I_C = 2.0mA, V_{CE} = 5V
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	- -	50 122	125 300	mV	I_C = 10mA, I_B = 0.5mA I_C = 100mA, I_B = 5.0mA
Base-Emitter Saturation Voltage	$V_{BE(sat)}$	- -	760 880	1,000 1,100	mV	I_C = 10mA, I_B = 0.5mA I_C = 100mA, I_B = 5.0mA
Base-Emitter Voltage	$V_{BE(on)}$	580	650 725	750 800	mV	I_C = 2.0mA, V_{CE} = 5V I_C = 10mA, V_{CE} = 5V
Current Gain-Bandwidth Product	f_T	100	175	-	MHz	V_{CE} = 5V, I_C = 10mA, f = 100MHz
Collector-Base Capacitance	C_{cbo}	-	1.5	-	pF	V_{CB} = 10V, f = 1.0MHz

Note: 7. Measured under pulsed conditions. Pulse width ≤ 300µs. Duty cycle ≤ 2%.

Typical Characteristics – Q1 NPN Transistor (@T_A = +25°C, unless otherwise specified.)

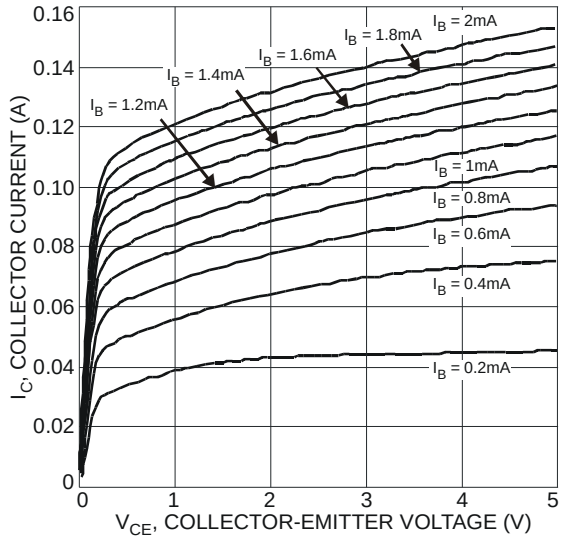


Fig. 4 Typical Collector Current vs. Collector-Emitter Voltage

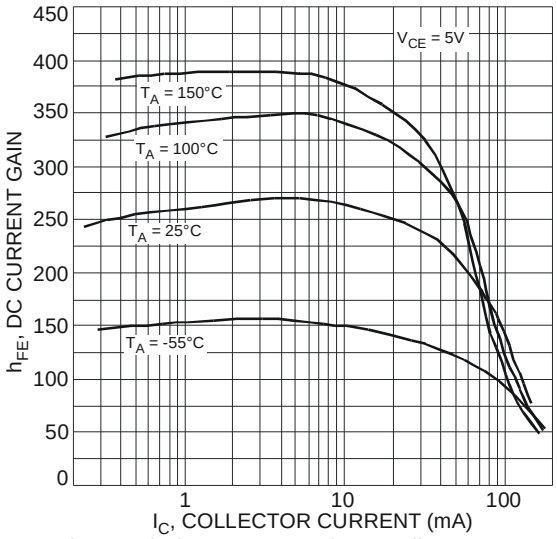


Fig. 5 Typical DC Current Gain vs. Collector Current

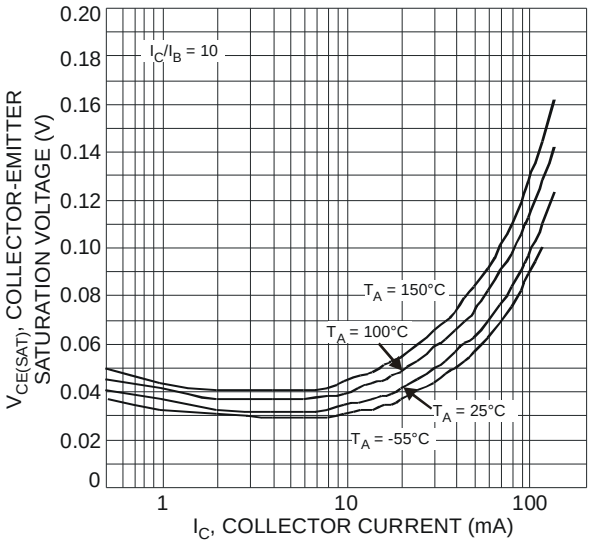


Fig. 6 Typical Collector-Emitter Saturation Voltage vs. Collector Current

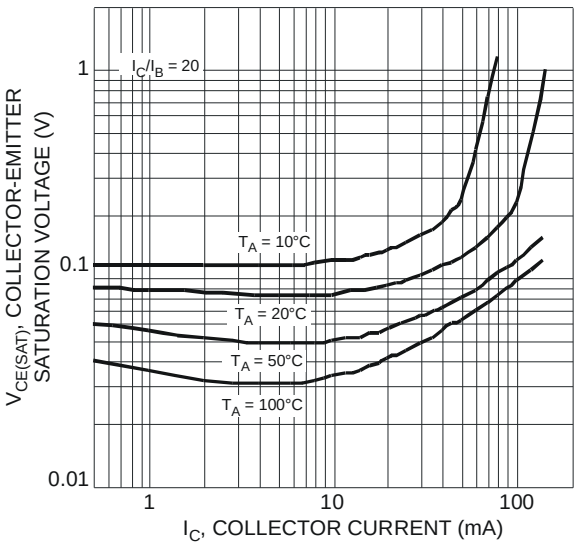


Fig. 7 Typical Collector-Emitter Saturation Voltage vs. Collector Current

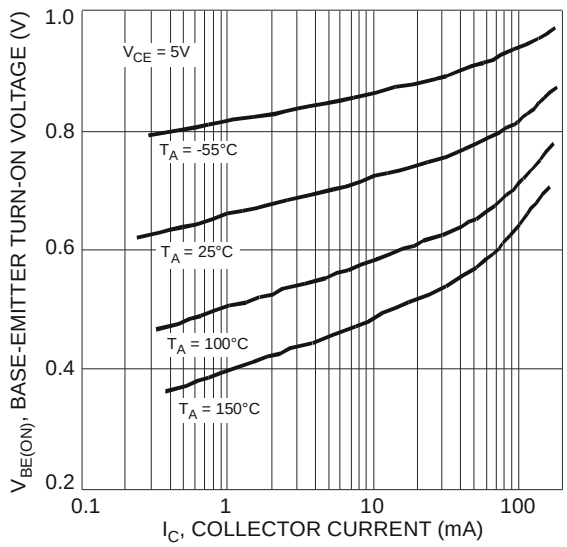


Fig. 8 Typical Base-Emitter Turn-On Voltage vs. Collector Current

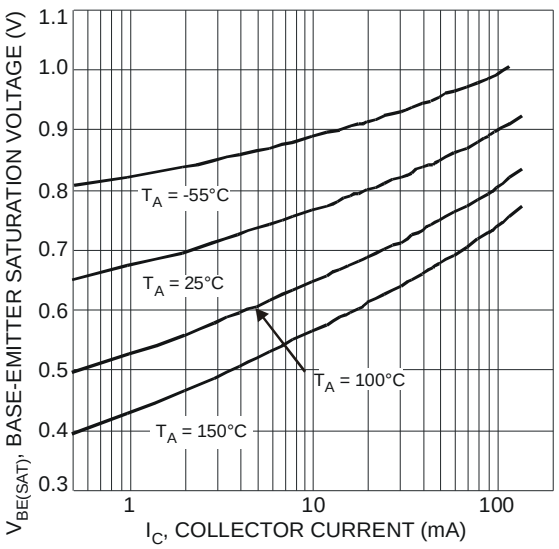


Fig. 9 Typical Base-Emitter Saturation Voltage vs. Collector Current

Electrical Characteristics – Q2 PNP Transistor (@T_A = +25°C, unless otherwise specified.)

Characteristic (Note 7)	Symbol	Min	Typical	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV_{CBO}	-50	-100	-	V	I_C = -10µA, I_B = 0
Collector-Emitter Breakdown Voltage	BV_{CES}	-50	-90	-	V	I_C = -10µA, I_B = 0
Collector-Emitter Breakdown Voltage	BV_{CEO}	-45	-65	-	V	I_C = -1mA, I_B = 0
Emitter-Base Breakdown Voltage	BV_{EBO}	-6	-8.5	-	V	I_E = -1µA, I_C = 0
Collector Cut-Off Current	I_{CBO}	-	-	-15	nA	V_{CB} = -30V
DC Current Gain	h_{FE}	- 200	340 330	- 470	-	I_C = -10µA, V_{CE} = -5V I_C = -2.0mA, V_{CE} = -5V
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	- -	-70 -300	-175 -500	mV	I_C = -10mA, I_B = -0.5mA I_C = -100mA, I_B = -5.0mA
Base-Emitter Saturation Voltage	$V_{BE(sat)}$	- -	-760 -885	-1,000 -1,100	mV	I_C = -10mA, I_B = -0.5mA I_C = -100mA, I_B = -5.0mA
Base-Emitter Voltage	$V_{BE(on)}$	-600 -	-670 -715	-780 -850	mV	I_C = -2.0mA, V_{CE} = -5V I_C = -10mA, V_{CE} = -5V
Current Gain-Bandwidth Product	f_T	100	340	-	MHz	V_{CE} = -5V, I_C = -10mA, f = 100MHz
Output Capacitance	C_{obo}	-	2.0	-	pF	V_{CB} = -10V, f = 1.0MHz

Note: 7. Measured under pulsed conditions. Pulse width ≤ 300µs. Duty cycle ≤ 2%.

Typical Characteristics – Q2 PNP Transistor (@T_A = +25°C, unless otherwise specified.)

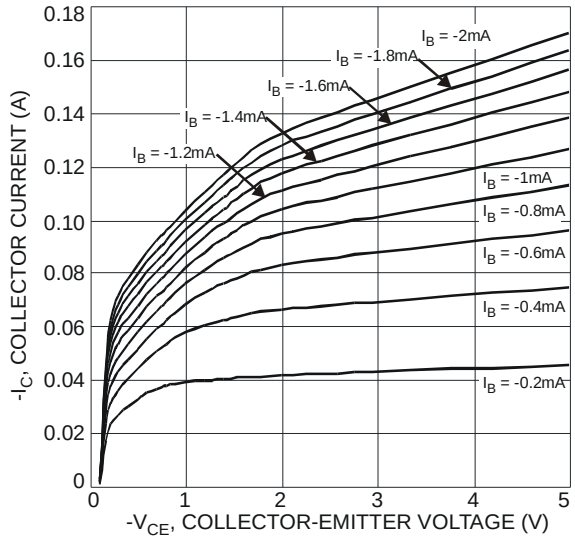


Fig. 10 Typical Collector Current vs. Collector-Emitter Voltage

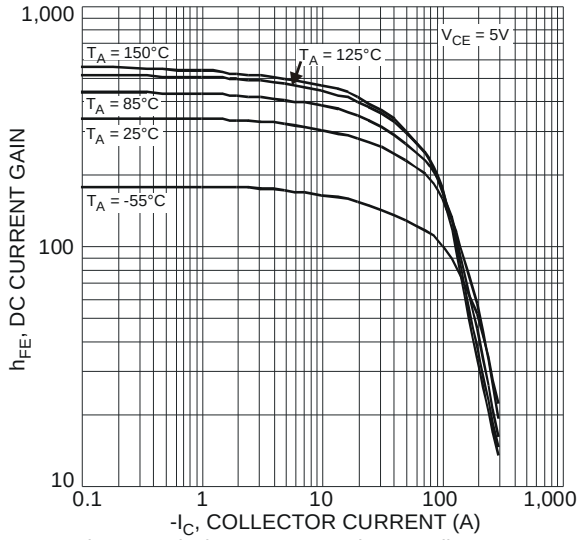


Fig. 11 Typical DC Current Gain vs. Collector Current

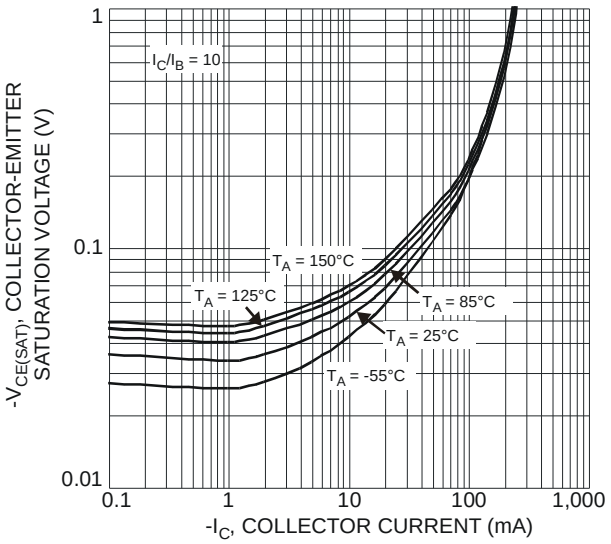


Fig. 12 Typical Collector-Emitter Saturation Voltage vs. Collector Current

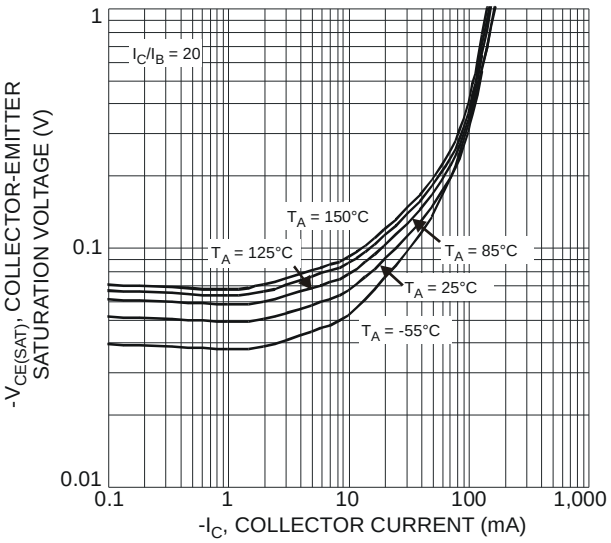


Fig. 13 Typical Collector-Emitter Saturation Voltage vs. Collector Current

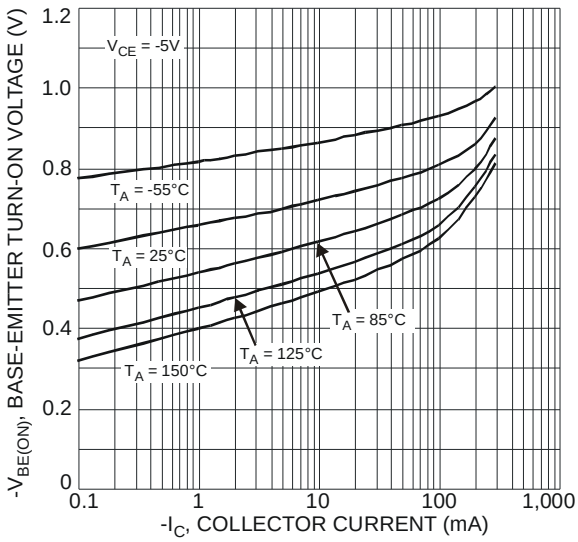


Fig. 14 Typical Base-Emitter Turn-On Voltage vs. Collector Current

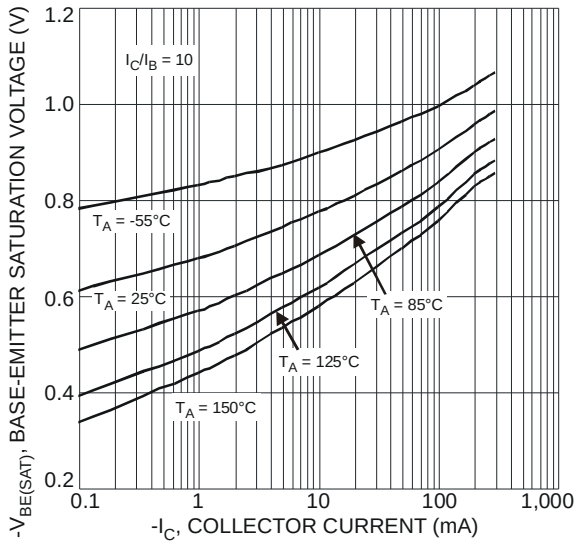
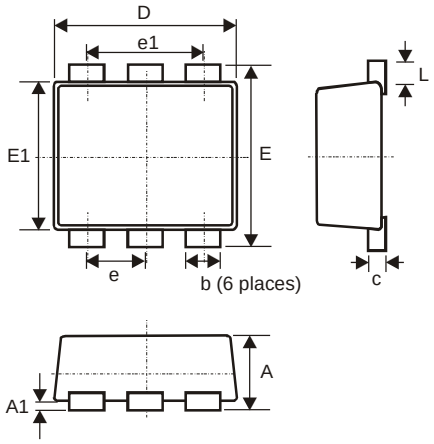


Fig. 15 Typical Base-Emitter Saturation Voltage vs. Collector Current

Package Outline Dimensions

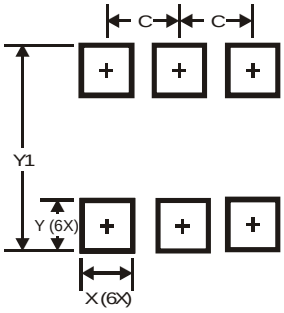
Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for the latest version.



SOT-963			
Dim	**Min**	**Max**	**Typ**
A	0.40	0.50	0.45
A1	0	0.05	-
C	0.120	0.180	0.150
D	0.95	1.05	1.00
E	0.95	1.05	1.00
E1	0.75	0.85	0.80
L	0.05	0.15	0.10
b	0.10	0.20	0.15
e	0.35 Typ		
e1	0.70 Typ		
All Dimensions in mm			

Suggest Pad Layout

Please see AP02001 at http://www.diodes.com/datasheets/ap02001.pdf for the latest version.



Dimensions	Value (in mm)
C	0.350
X	0.200
Y	0.200
Y1	1.100

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