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

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	15	V
Collector-Emitter Voltage	V_{CEO}	15	V
Emitter-Base Voltage	V_{EBO}	7	V
Peak Pulse Current	I_{CM}	5	A
Continuous Collector Current	I_C	1.5	A
Base Current	I_B	200	mA

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

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	-12	V
Collector-Emitter Voltage	V_{CEO}	-12	V
Emitter-Base Voltage	V_{EBO}	-7	V
Peak Pulse Current	I_{CM}	-3	A
Continuous Collector Current	I_C	-1.25	A
Base Current	I_B	-200	mA

Thermal Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic		Symbol	Value	Unit
Power Dissipation Linear Derating Factor	(Note 6)	P_D	1.1 8.8	W mW/°C
	(Note 7)		1.7 13.6	
Thermal Resistance, Junction to Ambient	(Note 6)	$R_{\theta JA}$	125	°C/W
	(Note 7)		45	
Thermal Resistance, Junction to Lead	(Note 8)	$R_{\theta JL}$	95	
Operating and Storage Temperature Range		T_J, T_{STG}	-55 to +150	°C

ESD Ratings (Note 9)

Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge - Human Body Model	ESD HBM	4,000	V	3A
Electrostatic Discharge - Machine Model	ESD MM	400	V	C

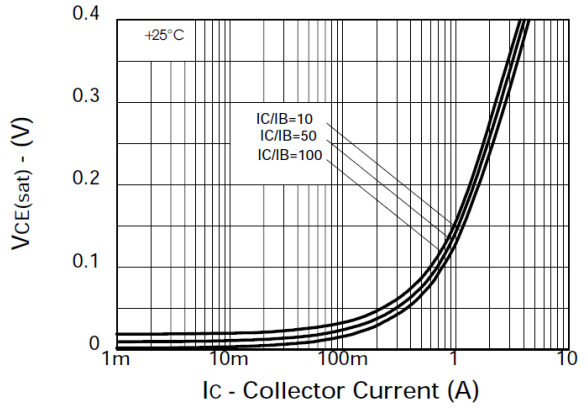
Notes:
6. For a device mounted with the collector lead on 25mm x 25mm 1oz copper that is on a single-sided 1.6mm FR4 PCB; the device is measured under still air conditions whilst operating in a steady-state. Two active dice running at equal power with heatsink split 50% to each collector.
7. Same as Note 6, except the device is measured at t < 5 seconds.
8. Thermal resistance from junction to solder-point (at the end of the collector lead).
9. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

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

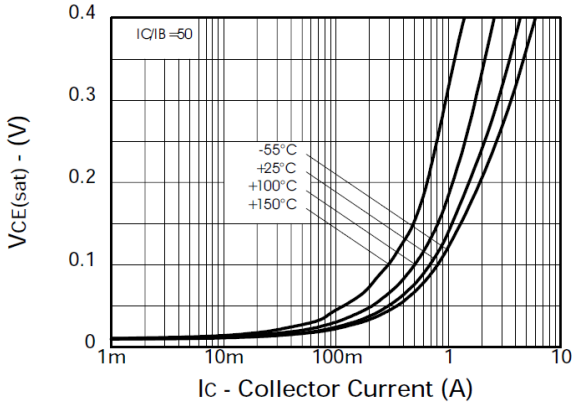
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS						
Collector-Base Breakdown Voltage	BV_{CBO}	15	—	—	V	I_C = 100µA, I_E = 0
Collector-Emitter Breakdown Voltage (Note 10)	BV_{CEO}	15	—	—	V	I_C = 10mA, I_B = 0
Emitter-Base Breakdown Voltage	BV_{EBO}	7	—	—	V	I_E = 100µA, I_C = 0
Collector Cut-Off Current	I_{CBO}	—	<-1	10	nA	V_{CB} = 10V
Emitter Cut-Off Current	I_{EBO}	—	<-1	10	nA	V_{EB} =5.6
Emitter Cut-Off Current	I_{CES}	—	<-1	10	nA	V_{CE} = 10V
ON CHARACTERISTICS (Note 10)						
DC Current Gain	h_{FE}	200 300 250 200 75 30	420 450 390 300 150 75	— — — — — —	—	I_C = 10mA, V_{CE} = 2V I_C = 100mA, V_{CE} = 2V I_C = 500mA, V_{CE} = 2V I_C = 1A, V_{CE} = 2V I_C = 3A, V_{CE} = 2V I_C = 5A, V_{CE} = 2V
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	—	16.5 40 75 150 205	20 55 100 200 245	mV mV mV mV mV	I_C = 100mA, I_B = 10mA I_C = 250mA, I_B = 10mA I_C = 500mA, I_B = 10mA I_C = 1A, I_B = 10mA I_C = 1.5A, I_B = 20mA
Base-Emitter Saturation Voltage	$V_{BE(sat)}$	—	0.93	1.10	V	I_C = 1.5A, I_B = 20mA
Base-Emitter Turn-On Voltage	$V_{BE(on)}$	—	0.865	1.10	V	I_C = 1.5A, V_{CE} = 2V
SMALL SIGNAL CHARACTERISTICS						
Output Capacitance	C_{obo}	—	15	—	pF	V_{CB} = 10V, f = 1.0MHz
Current Gain Bandwidth Product	f_T	—	180	—	MHz	I_C = 50mA, V_{CE} = 10V f = 100MHz
SWITCHING CHARACTERISTICS						
Turn-On Time	t_{on}	—	50	—	ns	I_C = 1A, V_{CC} = 10V
Turn-Off Time	t_{off}	—	250	—	ns	I_{B1} = -I_{B2} = 100mA

Note: 10. Measured under pulsed conditions. Pulse width ≤ 300µs. Duty cycle ≤ 2%.

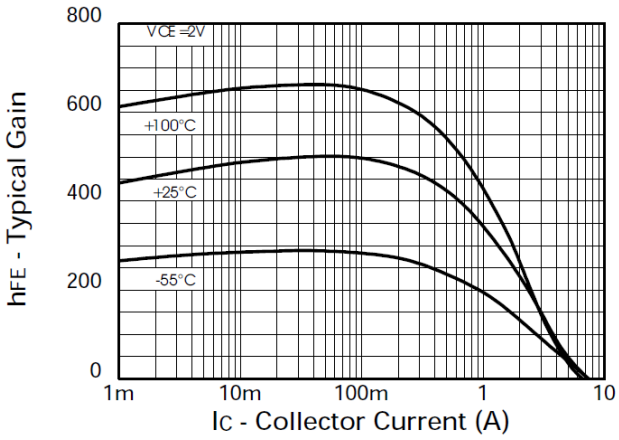
NPN - Typical Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)



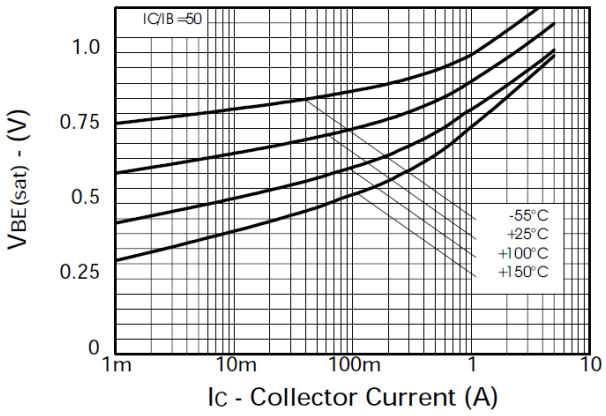
VCE(sat) v IC



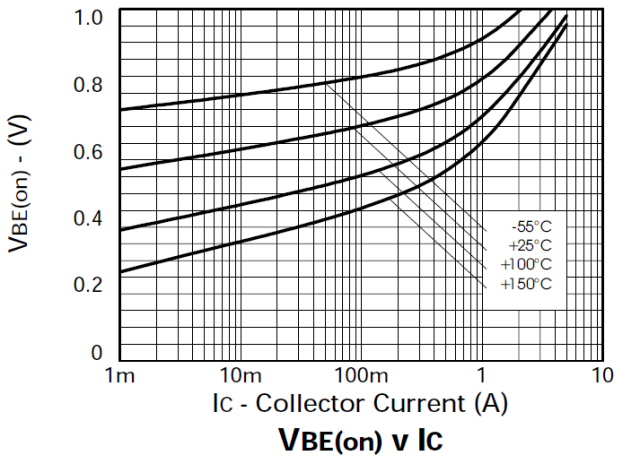
VCE(sat) v IC



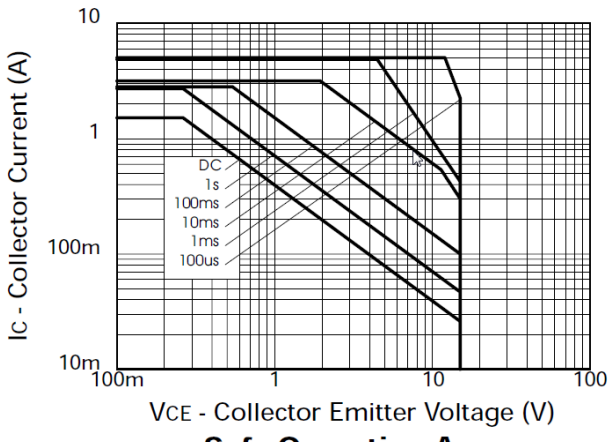
hFE v IC



VBE(sat) v IC



VBE(on) v IC



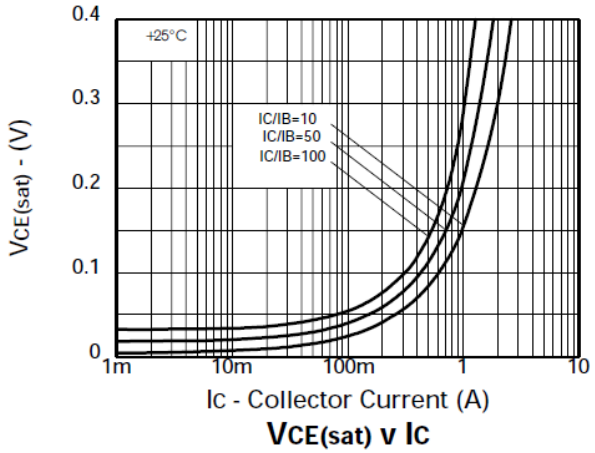
Safe Operating Area

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

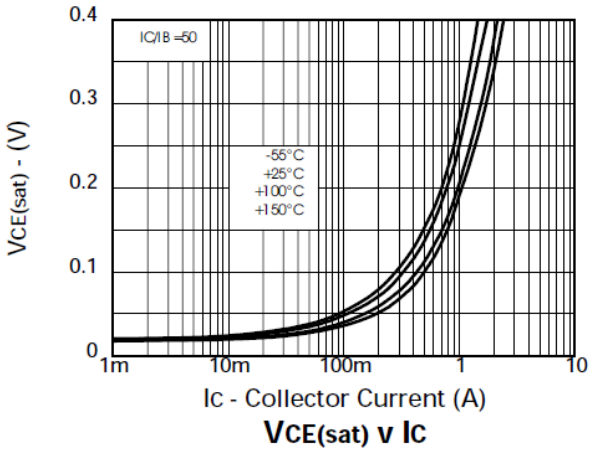
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS						
Collector-Base Breakdown Voltage	BV_{CBO}	-12	—	—	V	I_C = -100µA, I_E = 0
Collector-Emitter Breakdown Voltage (Note 11)	BV_{CEO}	-12	—	—	V	I_C = -10mA, I_B = 0
Emitter-Base Breakdown Voltage	BV_{EBO}	-7	—	—	V	I_E = -100µA, I_C = 0
Collector Cut-Off Current	I_{CBO}	—	<-1	-10	nA	V_{CB} = -10V
Emitter Cut-Off Current	I_{EBO}	—	<-1	-10	nA	V_{EB} = -5.6V
Emitter Cut-Off Current	I_{CES}	—	<-1	-10	nA	V_{CE} = -10V
ON CHARACTERISTICS (Note 11)						
DC Current Gain	h_{FE}	300 300 200 125 75 30	490 450 340 250 140 80	— — — — — —	—	I_C = -10mA, V_{CE} = -2V I_C = -100mA, V_{CE} = -2V I_C = -500mA, V_{CE} = -2V I_C = -1.25A, V_{CE} = -2V I_C = -2A, V_{CE} = -2V I_C = -3A, V_{CE} = -2V
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	—	-25 -55 -110 -160 -185	-40 -100 -175 -215 -240	mV mV mV mV mV	I_C = -100mA, I_B = -10mA I_C = -250mA, I_B = -10mA I_C = -500mA, I_B = -10mA I_C = -1A, I_B = -50mA I_C = -1.25A, I_B = -100mA
Base-Emitter Saturation Voltage	$V_{BE(sat)}$	—	-0.99	-1.10	V	I_C = -1.25A, I_B = -100mA
Base-Emitter Turn-On Voltage	$V_{BE(on)}$	—	-0.85	-1.0	V	I_C = -1.25A, V_{CE} = -2V
SMALL SIGNAL CHARACTERISTICS						
Output Capacitance	C_{obo}	—	15	—	pF	V_{CB} = -10V, f = 1.0MHz
Current Gain Bandwidth Product	f_T	—	220	—	MHz	I_C = -50mA, V_{CE} = -10V f = 100MHz
SWITCHING CHARACTERISTICS						
Turn-On Time	t_{on}	—	50	—	ns	I_C = -1A, V_{CC} = -10V
Turn-Off Time	t_{off}	—	135	—	ns	I_{B1} = -I_{B2} = -100mA

Note: 11. Measured under pulsed conditions. Pulse width ≤ 300µs. Duty cycle ≤ 2%.

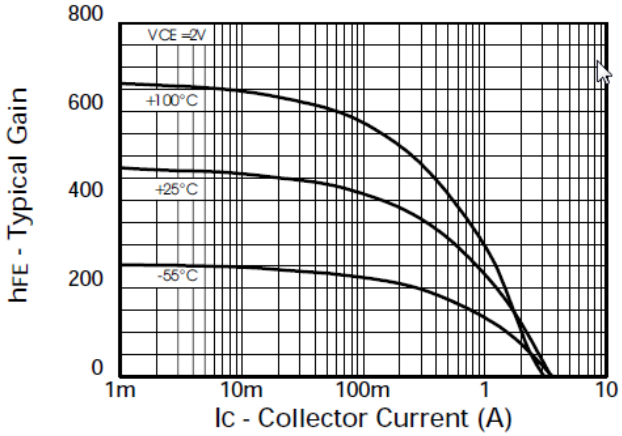
PNP - Typical Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)



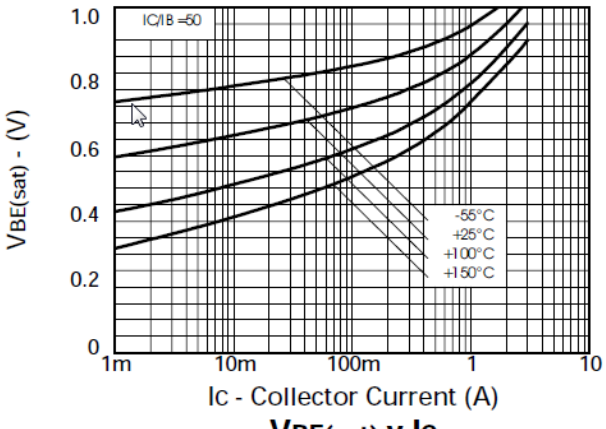
VCE(sat) v IC



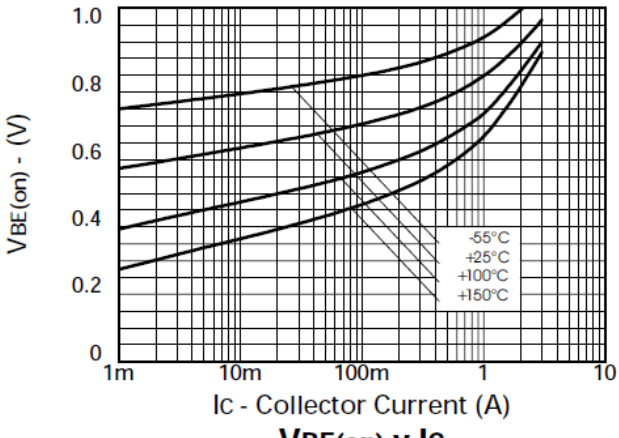
VCE(sat) v IC



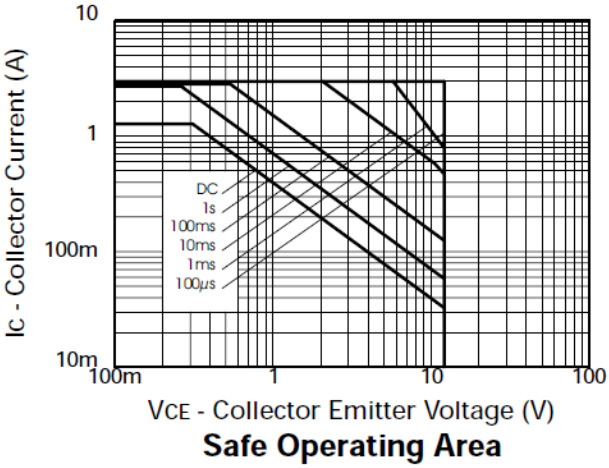
hFE v IC



VBE(sat) v IC



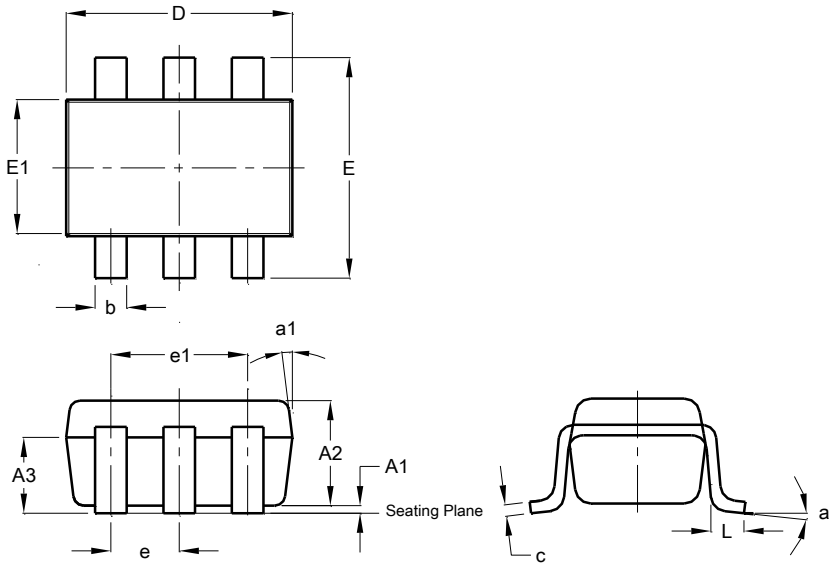
VBE(on) v IC



Safe Operating Area

Package Outline Dimensions

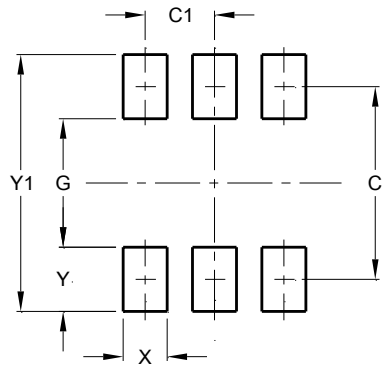
Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for the latest version.



SOT26			
Dim	**Min**	**Max**	**Typ**
A1	0.013	0.10	0.05
A2	1.00	1.30	1.10
A3	0.70	0.80	0.75
b	0.35	0.50	0.38
c	0.10	0.20	0.15
D	2.90	3.10	3.00
e	-	-	0.95
e1	-	-	1.90
E	2.70	3.00	2.80
E1	1.50	1.70	1.60
L	0.35	0.55	0.40
a	-	-	8°
a1	-	-	7°
All Dimensions in mm			

Suggested Pad Layout

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



Dimensions	Value (in mm)
C	2.40
C1	0.95
G	1.60
X	0.55
Y	0.80
Y1	3.20

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