

Description

This Bipolar Junction Transistor (BJT) is designed to meet the stringent requirements of Automotive Applications.

Features

- $BV_{CEO} > -140V$
- $BV_{ECO} > -7V$
- $I_C = -1A$ Continuous Collector Current
- $V_{CE(sat)} < -260mV @ -1A$
- $R_{CE(sat)} = 180m\Omega$
- High Power Dissipation SOT23
- 180V Forward Blocking Voltage
- Low Saturation Voltage
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**
- **PPAP Capable (Note 4)**

Mechanical Data

- Case: SOT23
- Case Material: Molded Plastic, "Green" Molding Compound
UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish – Matte Tin Plated Leads, Solderable per
MIL-STD-202, Method 208 ③
- Weight: 0.008 grams (Approximate)

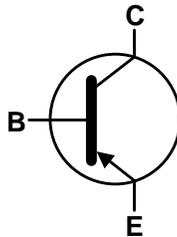
Applications

- DC-DC Converters
- High Side Switching

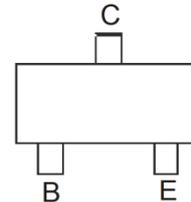
SOT23



Top View



Device Symbol



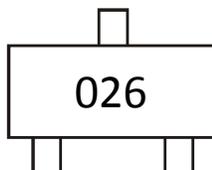
Top View
Pin-Out

Ordering Information (Notes 4 & 5)

Product	Compliance	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
ZXTP25140BFHQTA	Automotive	026	7	8	3,000

- Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
 2. See http://www.diodes.com/quality/lead_free.html for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
 3. Halogen and Antimony free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
 4. Automotive products are AEC-Q101 qualified and are PPAP capable. Refer to http://www.diodes.com/quality/product_compliance_definitions/.
 5. For packaging details, go to our website at <http://www.diodes.com/products/packages.html>.

Marking Information



026 = Product Type Marking Code

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

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V _{CB0}	-180	V
Collector-Emitter Voltage (Forward Blocking)	V _{CEX}	-180	V
Collector-Emitter Voltage	V _{CEO}	-140	V
Emitter-collector voltage (Reverse Blocking)	V _{ECO}	-7	V
Emitter-Base Voltage	V _{EBO}	-7	V
Continuous Collector Current (Note 5)	I _C	-1	A
Peak Pulse Current	I _{CM}	-3	A

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

Characteristic	Symbol	Value	Unit
Power Dissipation Linear derating factor	P _D	0.73	W
		5.84	
		1.05	
		8.4	
		1.25	
Thermal Resistance, Junction to Ambient	R _{θJA}	9.6	°C/W
		1.81	
		14.5	
		171	
Thermal Resistance, Junction to Lead	R _{θJL}	119	°C/W
		100	
		69	
Operating and Storage Temperature Range	T _J , T _{STG}	-55 to +150	°C

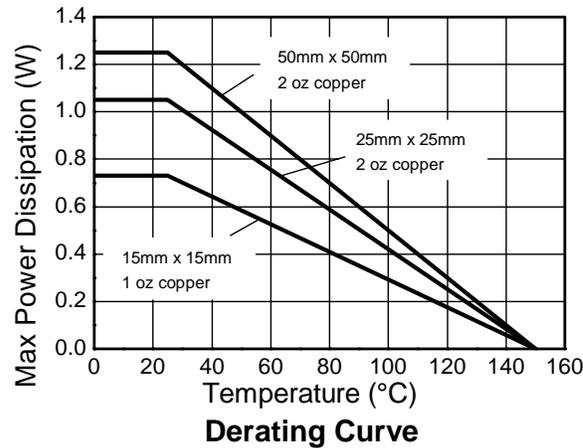
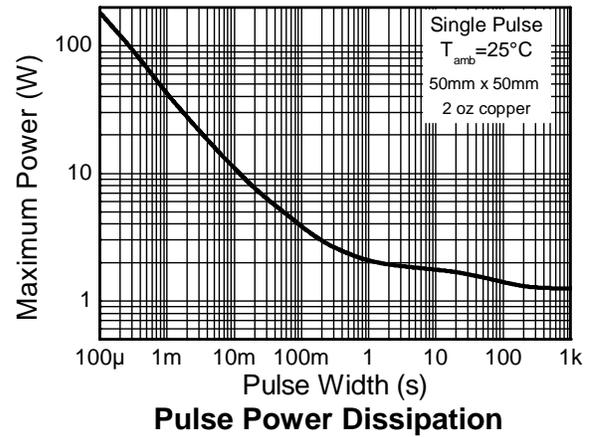
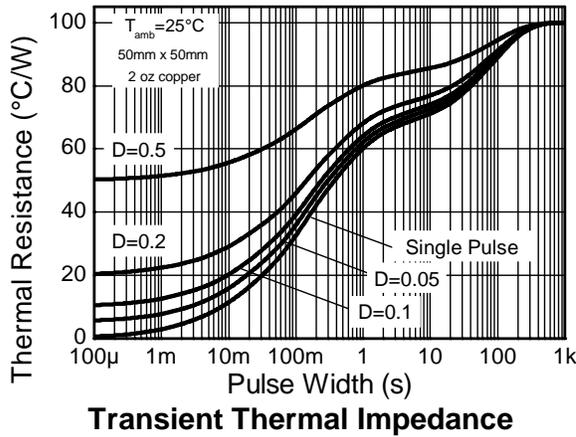
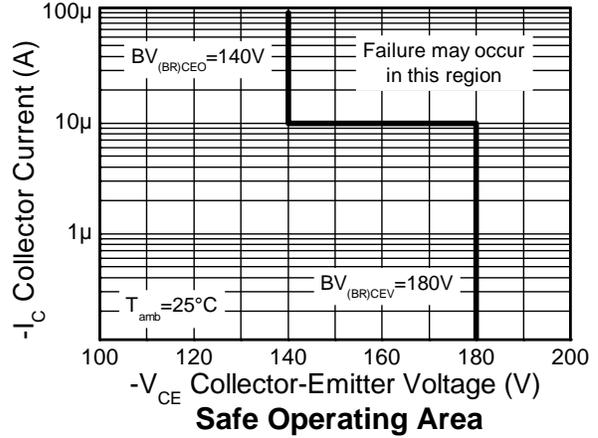
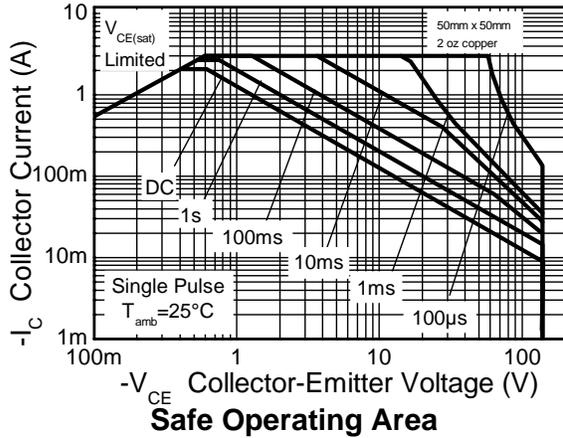
- Notes:
6. For a device surface mounted on 15mm x 15mm x 1.6mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions; the device is measured when operating in a steady-state condition.
 7. Same as note (4), except the device is surface mounted on 25mm x 25mm with 2 oz copper.
 8. Same as note (4), except the device is surface mounted on 50mm x 50mm with 2 oz copper.
 9. Same as note (6), except the device is measured at t<5secs.
 10. Thermal resistance from junction to solder-point (at the end of the collector lead).

ESD Ratings (Note 11)

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:
11. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

Thermal Characteristics and Derating Information

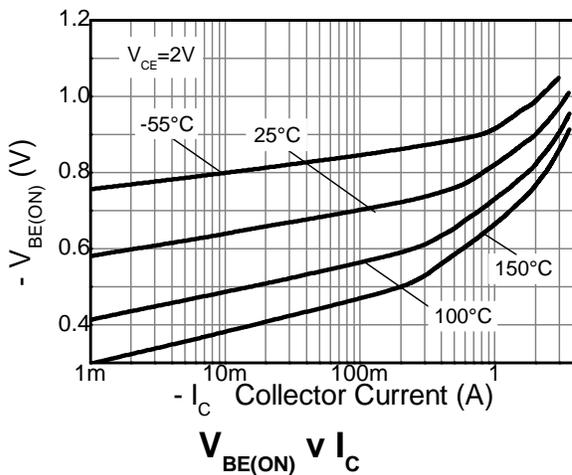
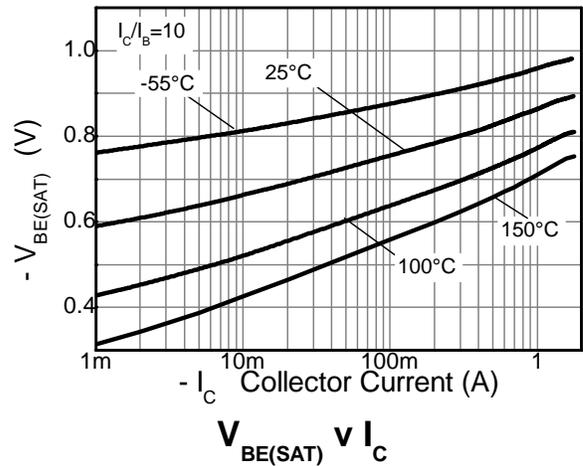
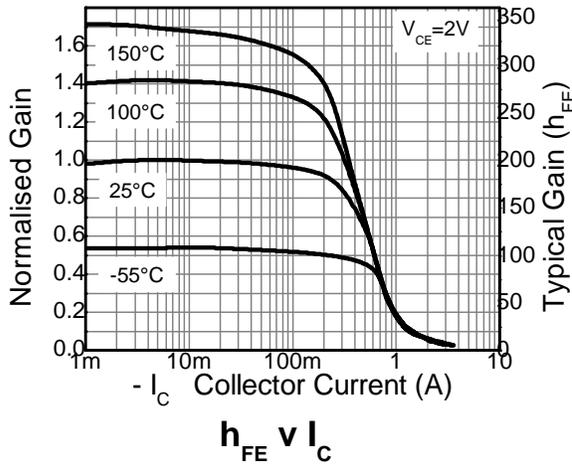
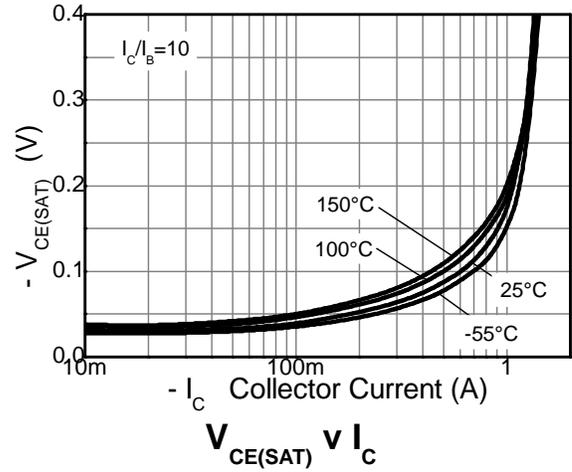
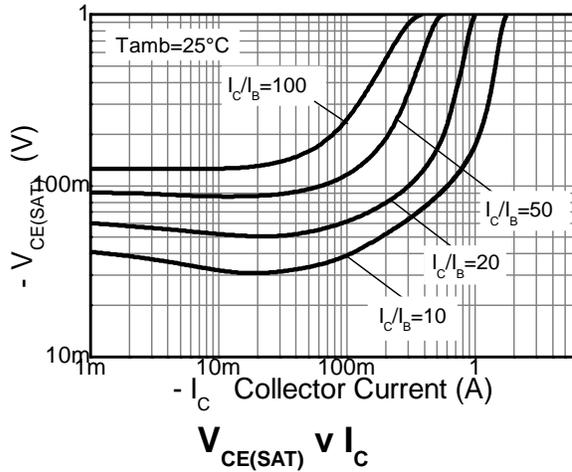


Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV _{CBO}	-180	-205	-	V	I _C = -100μA
Collector-Emitter Breakdown Voltage (Forward Blocking)	BV _{CEX}	-180	-205	-	V	I _C = -100μA R _{BE} ≤ 1kΩ or -0.25V < V _{BE} < 1V
Collector-Emitter Breakdown Voltage (Base Open) (Note 12)	BV _{CEO}	-140	-160	-	V	I _C = -10mA
Emitter-Base Breakdown Voltage	BV _{EBO}	-7	-8.2	-	V	I _E = -100μA
Emitter-Base Breakdown Voltage (Reverse Blocking) (Note 12)	BV _{ECO}	-7	-8.5	-	V	I _E = -100μA
Collector-Base Cutoff Current	I _{CBO}	-	< -1	-50	nA	V _{CB} = -144V
		-	-	-20	μA	V _{CB} = -144V, T _{amb} = +100°C
Collector-Emitter Cutoff Current	I _{CEX}	-	-	-100	nA	V _{CE} = -144V; R _{BE} ≤ 1kΩ or -0.25V < V _{BE} < 1V
Emitter-Base Cutoff Current	I _{EBO}	-	< -1	-50	nA	V _{EB} = -5.6V
Static Forward Current Transfer Ratio (Note 12)	h _{FE}	100	200	300	-	I _C = -10mA, V _{CE} = -2V
		100	190	-	-	I _C = -0.1A, V _{CE} = -2V
		20	30	-	-	I _C = -1A, V _{CE} = -2V
Collector-Emitter Saturation Voltage (Note 12)	V _{CE(sat)}	-	-40	-50	mV	I _C = -0.1A, I _B = -10mA
		-	-110	-135		I _C = -0.1A, I _B = -2mA
		-	-90	-110		I _C = -0.5A, I _B = -50mA
		-	-170	-230		I _C = -0.5A, I _B = -25mA
		-	-180	-260		I _C = -1A, I _B = -100mA
Base-Emitter Saturation Voltage (Note 12)	V _{BE(sat)}	-	-850	-950	mV	I _C = -1A, I _B = -100mA
Base-Emitter Saturation Voltage (Note 12)	V _{BE(on)}	-	-800	-900	mV	I _C = -1A, V _{CE} = -2V
Output Capacitance	C _{obo}	-	10	-	pF	V _{CB} = -20V, f = 1MHz
Transition Frequency	f _T	-	75	-	MHz	V _{CE} = -20V, I _C = -10mA, f = 20MHz
Turn-on time	t _{on}	-	102	-	ns	V _{CC} = -20V, I _C = -100mA,
Turn-off time	t _{off}	-	854	-	ns	I _{B1} = I _{B2} = -10mA

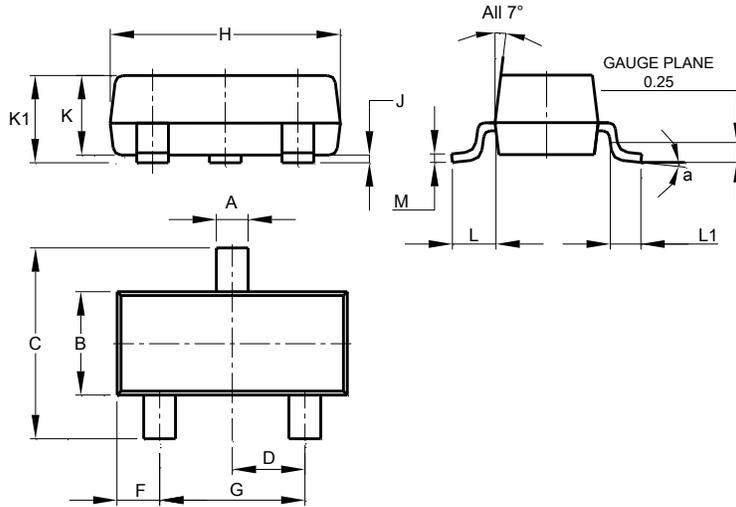
Notes: 12. Measured under pulsed conditions. Pulse width ≤ 300 μs. Duty cycle ≤ 2%.

Typical Electrical Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)



Package Outline Dimensions

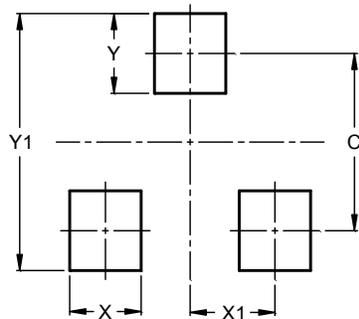
Please see AP02001 at http://www.diodes.com/_files/datasheets/ap02001.pdf for the latest version.



SOT23			
Dim	Min	Max	Typ
A	0.37	0.51	0.40
B	1.20	1.40	1.30
C	2.30	2.50	2.40
D	0.89	1.03	0.915
F	0.45	0.60	0.535
G	1.78	2.05	1.83
H	2.80	3.00	2.90
J	0.013	0.10	0.05
K	0.890	1.00	0.975
K1	0.903	1.10	1.025
L	0.45	0.61	0.55
L1	0.25	0.55	0.40
M	0.085	0.150	0.110
a	0°	8°	--
All Dimensions in mm			

Suggested Pad Layout

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



Dimensions	Value (in mm)
C	2.0
X	0.8
X1	1.35
Y	0.9
Y1	2.9

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