

Features

- $BV_{CEO} > -12V$
- $I_C = -4A$ Continuous Collector Current
- $I_{CM} = -15A$ Peak Pulse Current
- $R_{CE(sat)} = 37m\Omega$ for a Low Equivalent On-Resistance
- Low Saturation Voltage of $<-90mV$ max @ $-1A$
- h_{FE} Characterized up to $-15A$ for High Current Gain Hold-Up
- **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

Mechanical Data

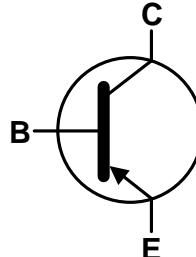
- Case: SOT26
- Case Material: Molded Plastic, "Green" Molding Compound.
- UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish – Matte Tin Plated Leads.
- Solderable per MIL-STD-202, Method 208 (63)
- Weight: 0.015 grams (Approximate)

Applications

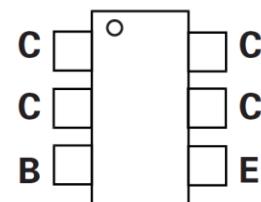
- DC-DC Converters
- Power Management Functions
- Power Switches
- Motor Control



Top View



Device Symbol



Pin-Out Top

Ordering Information (Notes 4)

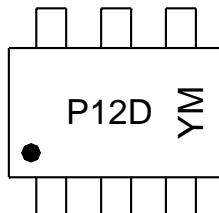
Product	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
ZXT13P12DE6TA	P12D	7	8	3,000

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. For packaging details, go to our website at <http://www.diodes.com/products/packages.html>.

Marking Information

SOT26



P12D = Product Type Marking Code
 YM = Date Code Marking
 Y or \bar{Y} = Year (ex: C = 2015)
 M or \bar{M} = Month (ex: 9 = September)

Date Code Key

Year	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Code	C	D	E	F	G	H	I	J	K	L	M

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Code	1	2	3	4	5	6	7	8	9	O	N	D

Absolute Maximum Ratings (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	-20	V
Collector-Emitter Voltage	V_{CEO}	-12	V
Emitter-Base Voltage	V_{EBO}	-7.5	V
Base Current	I_B	-500	mA
Continuous Collector Current	I_C	-4	A
Peak Pulse Collector Current	I_{CM}	-15	A

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

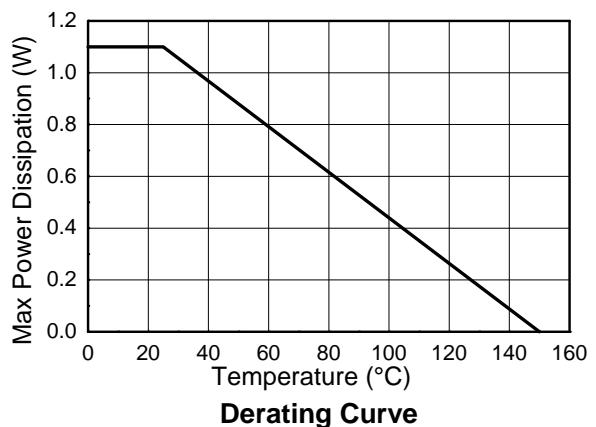
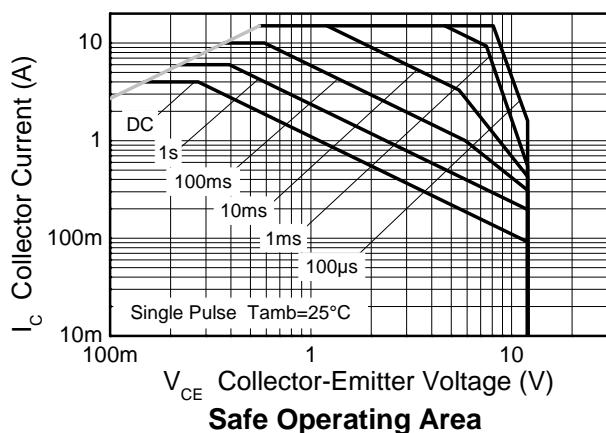
Characteristic	Symbol	Value	Unit
Power Dissipation Linear Derating Factor	P_D	1.1	W mW/ $^\circ\text{C}$
		8.8	
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	1.7	$^\circ\text{C}/\text{W}$
		13.6	
Thermal Resistance, Junction to Lead	$R_{\theta JL}$	113	$^\circ\text{C}/\text{W}$
		73	
Operating and Storage Temperature Range	T_J, T_{STG}	18.61	
		-55 to +150	$^\circ\text{C}$

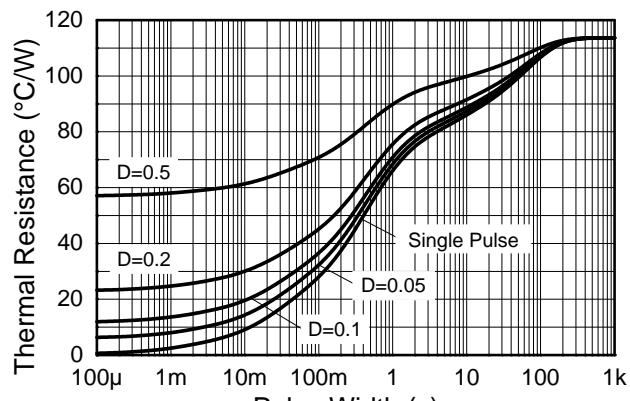
ESD Ratings (Note 8)

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:

- 5. For a device mounted with collector leads on 25mm x 25mm 1oz copper that is on a single-sided 1.6mm FR4 PCB; device is measured under still air conditions whilst operating in a steady-state.
- 6. Same as Note 5, except the device is measured at $t \leq 5$ seconds.
- 7. Thermal resistance from junction to solder-point (at the end of the collector leads).
- 8. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

Thermal Characteristics and Derating Information


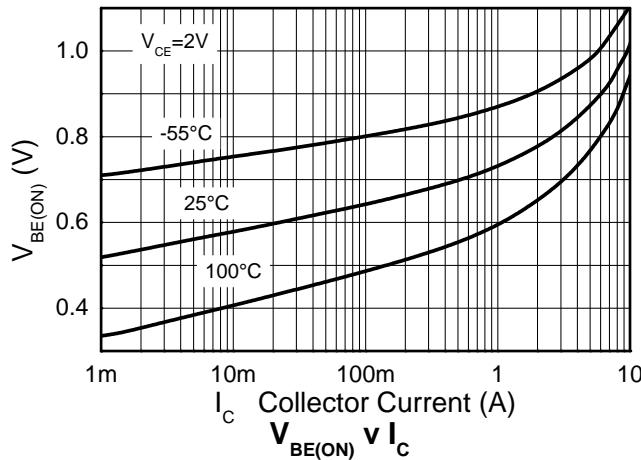
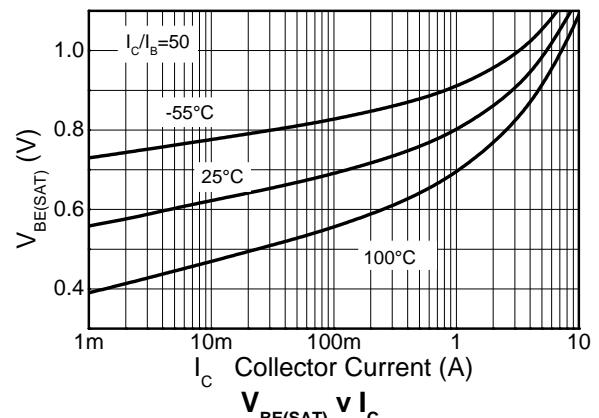
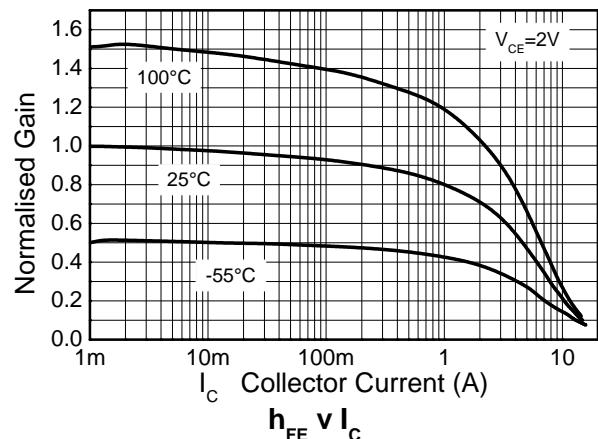
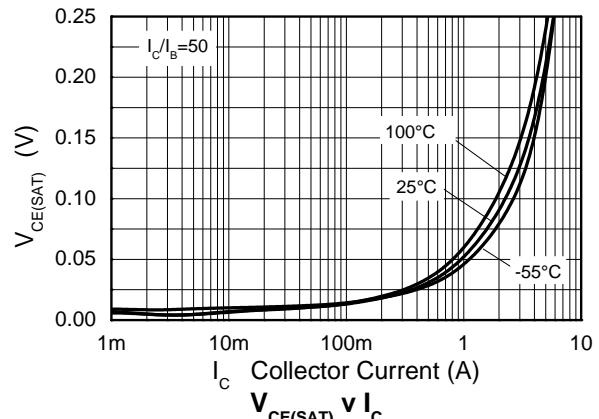
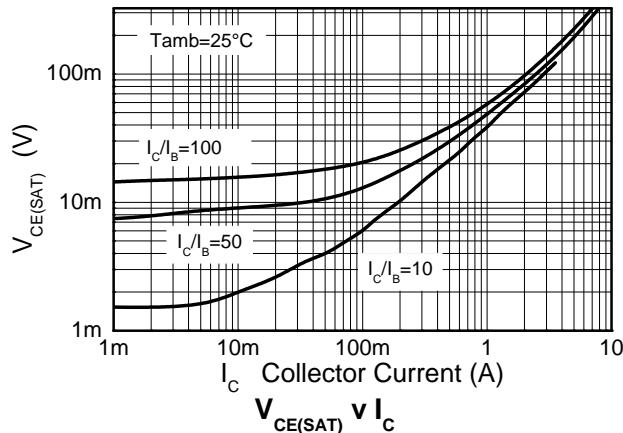
**Transient Thermal Impedance**

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS						
Collector-Base Breakdown Voltage	BV_{CBO}	-20	-33	—	V	$I_C = -100\mu\text{A}$
Collector-Emitter Breakdown Voltage (Note 9)	BV_{CEO}	-12	-25	—	V	$I_C = -10\text{mA}$
Emitter-Base Breakdown Voltage	BV_{EBO}	-7.5	-8.5	—	V	$I_E = -100\mu\text{A}$
Collector-Base Cut-Off Current	I_{CBO}	—	—	-100	nA	$V_{\text{CB}} = -16\text{V}$
Emitter Cut-Off Current	I_{EBO}	—	—	-100	nA	$V_{\text{EB}} = -6\text{V}$
Collector-Emitter Cut-Off Current	I_{CES}	—	—	-100	nA	$V_{\text{CES}} = -16\text{V}$
ON CHARACTERISTICS (Note 9)						
DC Current Gain	h_{FE}	300	500	—	—	$I_C = -10\text{mA}, V_{\text{CE}} = -2\text{V}$
		300	450	900	—	$I_C = -1\text{A}, V_{\text{CE}} = -2\text{V}$
		200	300	—	—	$I_C = -4\text{A}, V_{\text{CE}} = -2\text{V}$
		20	30	—	—	$I_C = -15\text{A}, V_{\text{CE}} = -2\text{V}$
Collector-Emitter Saturation Voltage	$V_{\text{CE}(\text{sat})}$	—	-7.5	-10	mV	$I_C = -100\text{mA}, I_B = -10\text{mA}$
		—	-68	-90		$I_C = -1\text{A}, I_B = -10\text{mA}$
		—	-135	-175		$I_C = -3\text{A}, I_B = -50\text{mA}$
		—	-200	-250		$I_C = -4\text{A}, I_B = -50\text{mA}$
		—	-150	-175		$I_C = -4\text{A}, I_B = -400\text{mA}$
Base-Emitter Saturation Voltage	$V_{\text{BE}(\text{sat})}$	—	—	-1.0	V	$I_C = -4\text{A}, I_B = -50\text{mA}$
Base-Emitter Turn-On Voltage	$V_{\text{BE}(\text{on})}$	—	—	-0.9	V	$I_C = -4\text{A}, V_{\text{CE}} = -2\text{V}$
SMALL SIGNAL CHARACTERISTICS						
Current Gain-Bandwidth Product	f_T	—	55	—	MHz	$V_{\text{CE}} = -10\text{V}, I_C = -50\text{mA}, f = 50\text{MHz}$
Output Capacitance	C_{obo}	—	115	—	pF	$V_{\text{CB}} = -10\text{V}, f = 1\text{MHz}$
Turn-On Time	$t_{(\text{on})}$	—	70	—	ns	$V_{\text{CC}} = -10\text{V}, I_C = -3\text{A}$
Turn-Off Time	$t_{(\text{off})}$	—	265	—	ns	$I_{B1} = I_{B2} = -60\text{mA}$

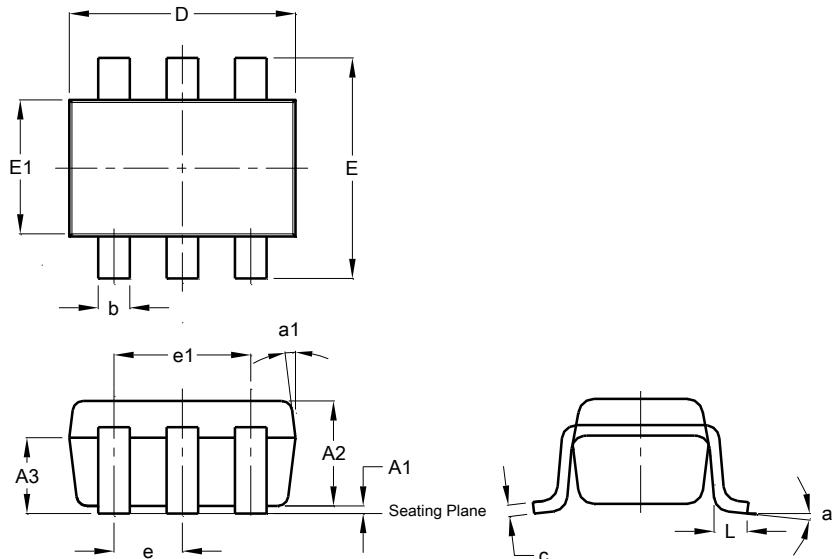
Note: 9. Measured under pulsed conditions; pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 2\%$.

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



Package Outline

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

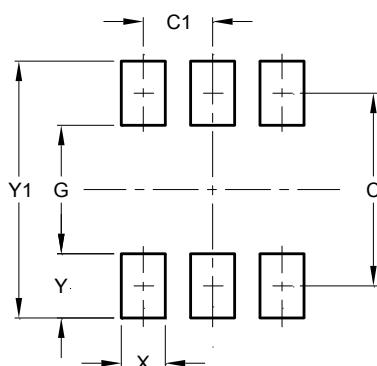


SOT26			
Dim	Min	Max	Typ
A1	0.013	0.10	0.05
A2	1.00	1.30	1.10
A3	0.70	0.80	0.75
b	0.35	0.50	0.38
c	0.10	0.20	0.15
D	2.90	3.10	3.00
e	-	-	0.95
e1	-	-	1.90
E	2.70	3.00	2.80
E1	1.50	1.70	1.60
L	0.35	0.55	0.40
a	-	-	8°
a1	-	-	7°

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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