

Features

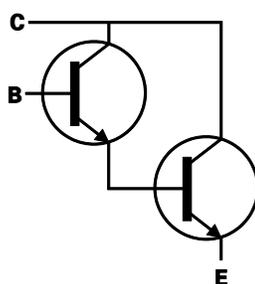
- Epitaxial Planar Die Construction
- Ideal for Low Power Amplification and Switching
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **For automotive applications requiring specific change control (i.e. parts qualified to AEC-Q100/101/104/200, PPAP capable, and manufactured in IATF 16949 certified facilities), please [contact us](mailto:contact@diodes.com) or your local Diodes representative. <https://www.diodes.com/quality/product-definitions/>**

Mechanical Data

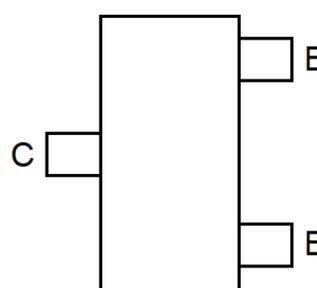
- Package: SOT23
- Package Material: Molded Plastic "Green" Compound
UL Flammability Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish - Matte Tin Plated Leads, Solderable per MIL-STD-202, Method 208 ③
- Weight: 0.008 grams (Approximate)



Top View



Device Symbol



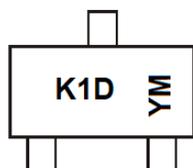
Top View
Pin-Out

Ordering Information (Note 4)

Part Number	Package	Marking	Reel Size (inches)	Tape Width (mm)	Packing	
					Qty.	Carrier
MMBT6427-7-F	SOT23	K1D	7	8	3,000	Reel

- Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
 2. See <https://www.diodes.com/quality/lead-free/> 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 <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

Marking Information



K1D = Product Type Marking Code
 YM = Date Code Marking
 Y or \bar{Y} = Year (ex: K = 2023)
 M or \bar{M} = Month (ex: 9 = September)

Date Code Key

Year	2010	-	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Code	X	-	K	L	M	N	P	R	S	T	U	V

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_{CB0}	40	V
Collector-Emitter Voltage	V_{CEO}	40	V
Emitter-Base Voltage	V_{EBO}	12	V
Collector Current	I_C	500	mA
Peak Collector Current	I_{CM}	1	A

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

Characteristic	Symbol	Value	Unit
Power Dissipation	P_D	310	mW
		(Note 5)	
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	403	$^\circ\text{C/W}$
		(Note 6)	
Thermal Resistance, Junction to Leads	$R_{\theta JL}$	350	$^\circ\text{C/W}$
Thermal Resistance, Junction to Case	$R_{\theta JC}$	120	$^\circ\text{C/W}$
Operating and Storage Temperature Range	T_J, T_{STG}	-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 on minimum recommended pad layout 1oz copper that is on a single-sided FR4 PCB; device is measured under still air conditions whilst operating in a steady-state.
 6. Same as note (5), except the device is mounted on 15mm x 15mm 1oz copper.
 7. Thermal resistance from junction to solder-point (at the end of the leads).
 8. Refer to JEDEC specification JESD22-A114, JESD22-A115 and JES-022-C101.

Thermal Characteristics and Derating Information

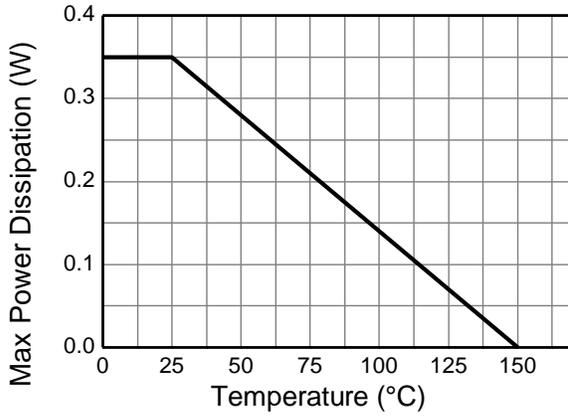


Figure 1. Derating Curve

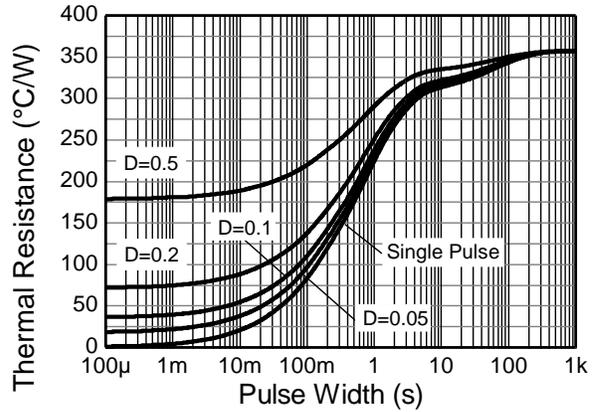


Figure 2. Transient Thermal Impedance

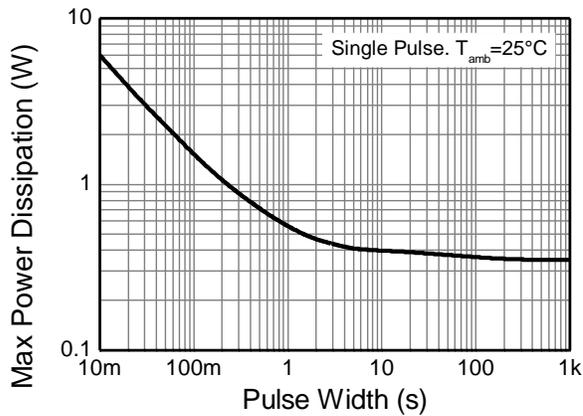


Figure 3. Pulse Power Dissipation

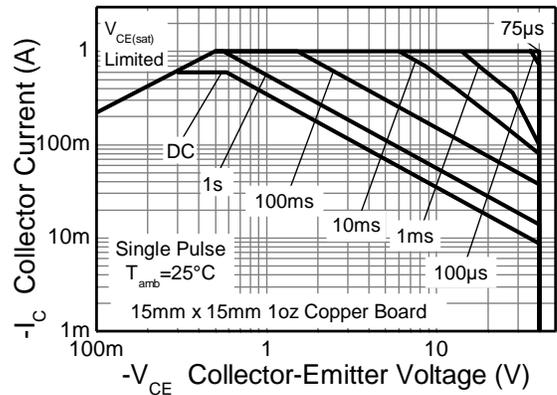


Figure 4. Safe Operating Area

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}	40	170	—	V	$I_C = 100\mu\text{A}$
Collector-Emitter Breakdown Voltage (Note 9)	BV_{CEO}	40	66	—	V	$I_C = 10\text{mA}$
Emitter-Base Breakdown Voltage	BV_{EBO}	12	17	—	V	$I_E = 100\mu\text{A}$
Collector Cutoff Current	I_{CBO}	—	1	50	nA	$V_{CB} = 30\text{V}$
Collector Cutoff Current	I_{CES}	—	0.03	1	μA	$V_{CE} = 25\text{V}$
Emitter Cutoff Current	I_{EBO}	—	1	50	nA	$V_{EB} = 10\text{V}$
ON CHARACTERISTICS (Note 9)						
DC Current Gain	h_{FE}	10,000 20,000 14,000	— 100,000 —	100,000 200,000 140,000	—	$I_C = 10\text{mA}, V_{CE} = 5\text{V}$ $I_C = 100\text{mA}, V_{CE} = 5\text{V}$ $I_C = 500\text{mA}, V_{CE} = 5\text{V}$
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	—	0.68 0.87	1.2 1.5	V	$I_C = 50\text{mA}, I_B = 0.5\text{mA}$ $I_C = 500\text{mA}, I_B = 0.5\text{mA}$
Base-Emitter Saturation Voltage	$V_{BE(sat)}$	—	1.55	2	V	$I_C = 500\text{mA}, I_B = 0.5\text{mA}$
Base-Emitter On Voltage	$V_{BE(on)}$	—	1.25	1.75	V	$I_C = 50\text{mA}, V_{CE} = 5\text{V}$

Note: 9. Measured under pulsed conditions. Pulse width $\leq 300\mu\text{s}$. Duty cycle $\leq 2\%$.

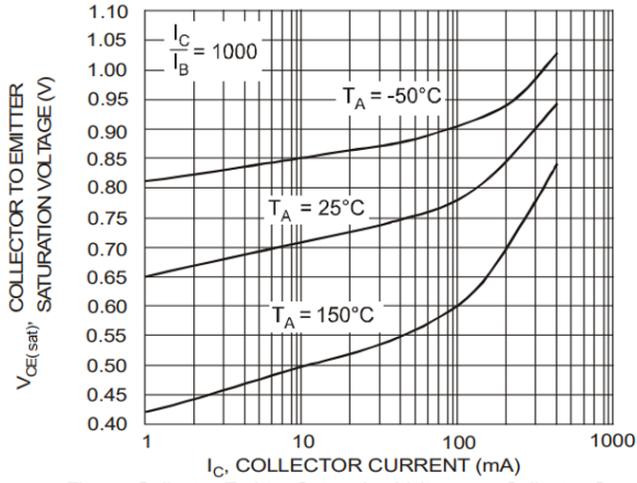


Fig. 5, Collector Emitter Saturation Voltage vs. Collector Current

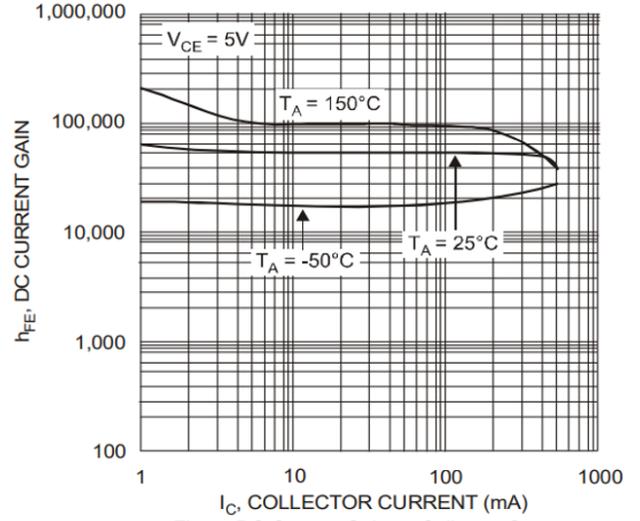


Fig. 6, DC Current Gain vs. Collector Current

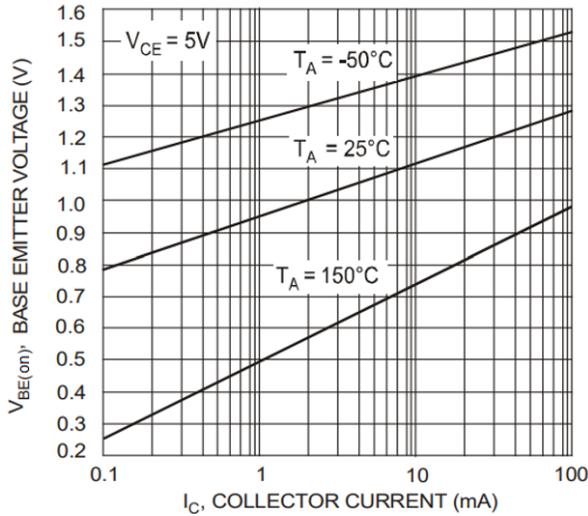


Fig. 7, Base Emitter Voltage vs. Collector Current

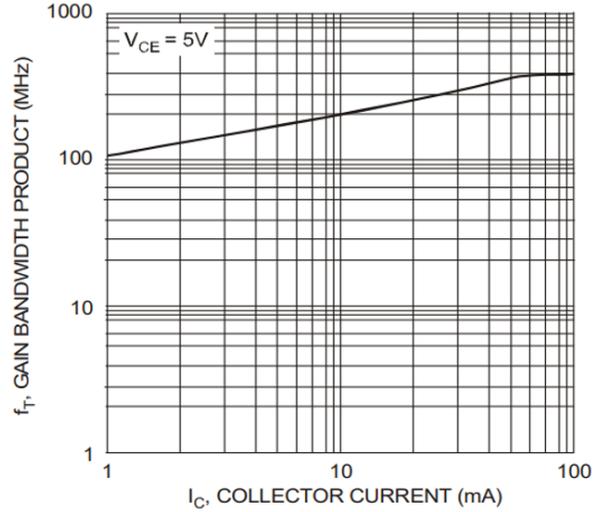
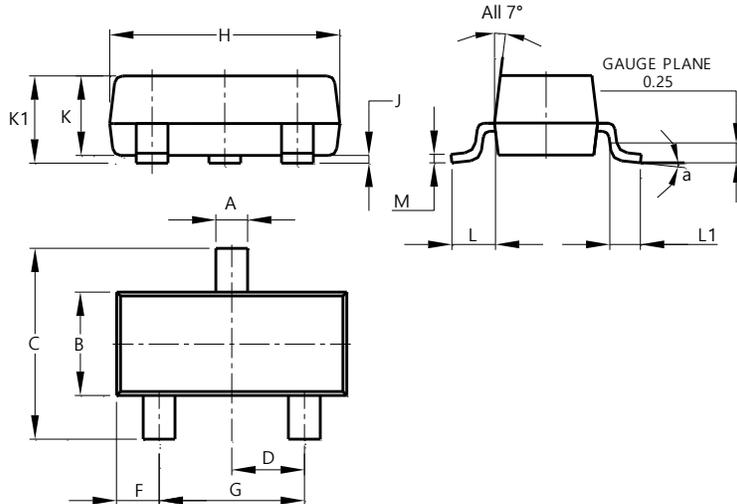


Fig. 8, Gain Bandwidth Product vs. Collector Current

Package Outline Dimensions

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

SOT23

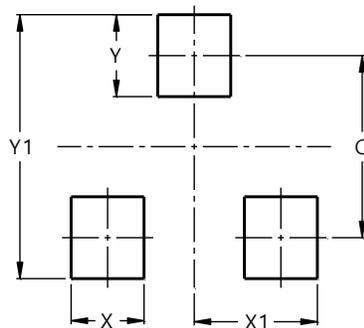


SOT23			
Dim	Min	Max	Typ
A	0.37	0.51	0.40
B	1.20	1.40	1.30
C	2.30	2.50	2.40
D	0.89	1.03	0.915
F	0.45	0.60	0.535
G	1.78	2.05	1.83
H	2.80	3.00	2.90
J	0.013	0.10	0.05
K	0.890	1.00	0.975
K1	0.903	1.10	1.025
L	0.45	0.61	0.55
L1	0.25	0.55	0.40
M	0.085	0.150	0.110
a	0°	8°	--
All Dimensions in mm			

Suggested Pad Layout

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

SOT23



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

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