

Features

- Epitaxial Planar Die Construction
- Ideal for Low Power Amplification and Switching
- Complementary NPN Type: MMBTA05 / MMBTA06
- 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)

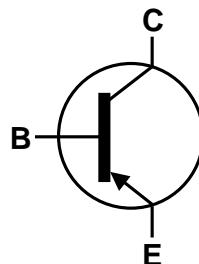
Mechanical Data

- Case: SOT-23
- 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 (E3)
- Weight: 0.008 grams (Approximate)

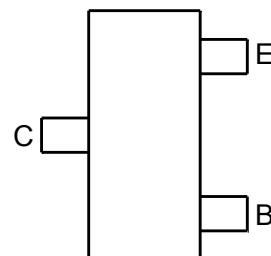
SOT23



Top View



Device Symbol



Top View
Pin-Out

Ordering Information (Notes 4 & 5)

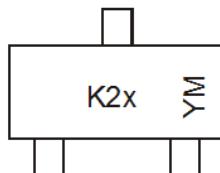
Part Number	Compliance	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
MMBTA55-7-F	AEC-Q101	K2H	7	8	3,000
MMBTA56-7-F	AEC-Q101	K2G	7	8	3,000
MMBTA56Q-7-F	Automotive	K2G	7	8	3,000
MMBTA56Q-13-F	Automotive	K2G	13	8	10,000

Notes:

- No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
- 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.
- Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
- Automotive products are AEC-Q101 qualified and are PPAP capable. Automotive, AEC-Q101 and standard products are electrically and thermally the same, except where specified.
- For packaging details, go to our website at <http://www.diodes.com/products/packages.html>.

Marking Information

SOT23



K2x = Product Type Marking Code
 YM = Date Code Marking
 Y = Year (ex: C = 2015)
 M = Month (ex: 9 = September)

Date Code Key

Year	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Code	C	D	E	F	G	H	I	J	K	L	M	N
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	MMBTA55	MMBTA56	Unit
Collector-Base Voltage	V_{CBO}	-60	-80	V
Collector-Emitter Voltage	V_{CEO}	-60	-80	V
Emitter-Base Voltage	V_{EBO}		-4.0	V
Collector Current - Continuous	I_C		-500	mA

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

Characteristic	Symbol	Value	Unit
Power Dissipation	P_D	310	mW
		350	
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	403	°C/W
		357	
Thermal Resistance, Junction to Leads	$R_{\theta JL}$	350	°C/W
Operating and Storage Temperature Range	$T_{J,T_{STG}}$	-55 to +150	°C

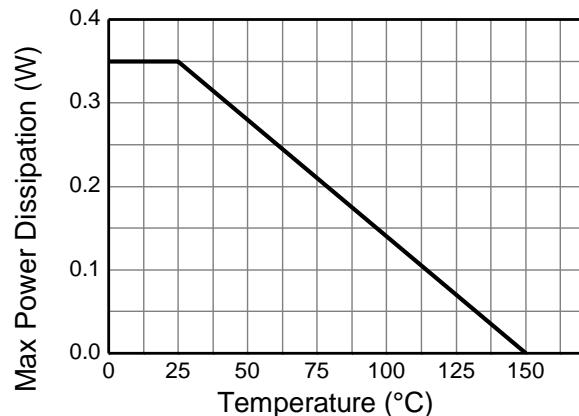
ESD Ratings (Note 9)

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

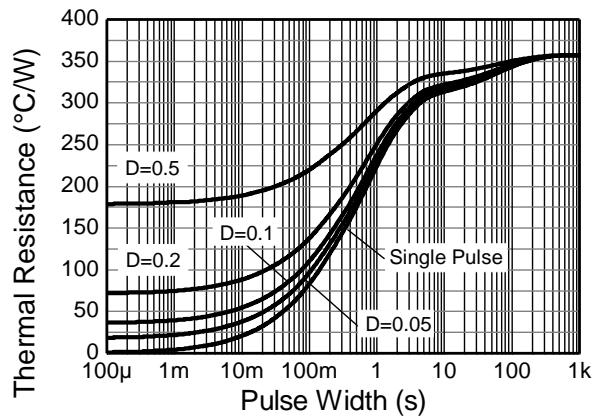
Notes:

- 6. For a device mounted 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.
- 7. Same as Note 6, except the device is mounted on 15 mm x 15mm 1oz copper.
- 8. Thermal resistance from junction to solder-point (at the end of the leads).
- 9. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

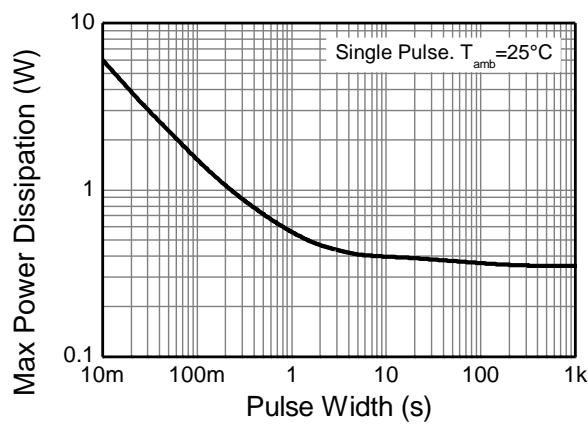
Thermal Characteristics and Derating Information



Derating Curve



Transient Thermal Impedance



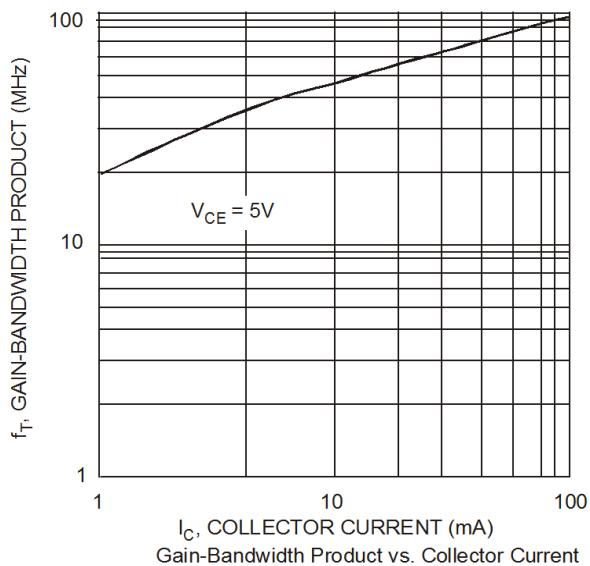
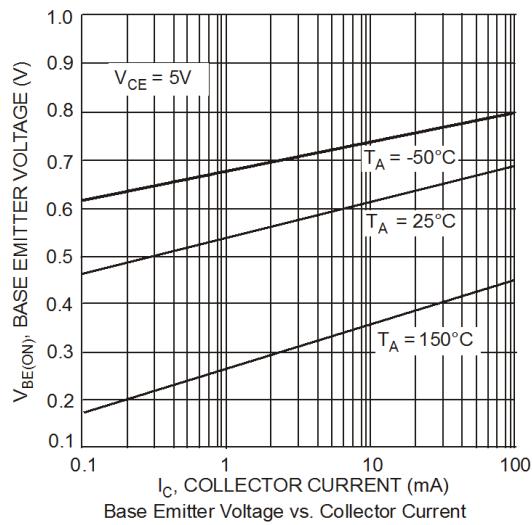
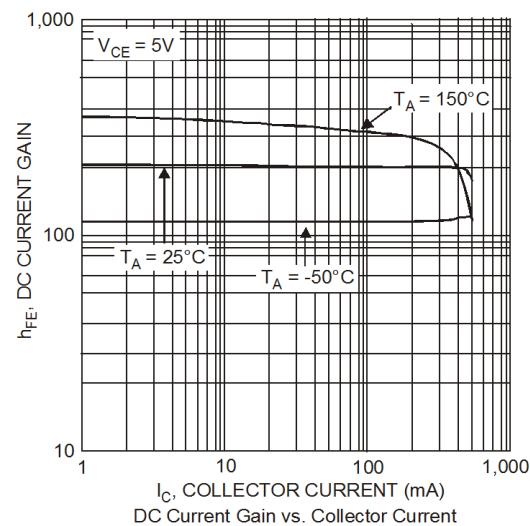
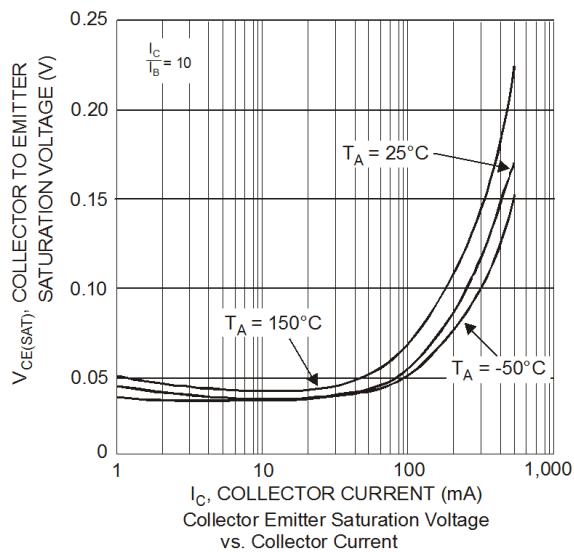
Pulse Power Dissipation

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

Characteristic	Symbol	Min	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 10)					
Collector-Base Breakdown Voltage	MMBTA55 MMBTA56	BV_{CBO}	-60 -80	—	V $I_C = -100\mu\text{A}, I_E = 0$
Collector-Emitter Breakdown Voltage	MMBTA55 MMBTA56	BV_{CEO}	-60 -80	—	V $I_C = -1.0\text{mA}, I_B = 0$
Emitter-Base Breakdown Voltage		BV_{EBO}	-5.0	-4.0	— $I_E = -100\mu\text{A}, I_C = 0$
Collector Cut-Off Current	MMBTA55 MMBTA56	I_{CBO}	—	-100	nA $V_{\text{CB}} = -60\text{V}, I_E = 0$ $V_{\text{CB}} = -80\text{V}, I_E = 0$
Collector Cut-Off Current		I_{CEX}	—	-100	nA $V_{\text{CE}} = -60\text{V}, I_B = 0\text{V}$ $V_{\text{CE}} = -80\text{V}, I_B = 0\text{V}$
ON CHARACTERISTICS (Note 10)					
DC Current Gain		h_{FE}	100	—	— $I_C = -10\text{mA}, V_{\text{CE}} = -1.0\text{V}$ $I_C = -100\text{mA}, V_{\text{CE}} = -1.0\text{V}$
Collector-Emitter Saturation Voltage		$V_{\text{CE}(\text{SAT})}$	—	-0.25	V $I_C = -100\text{mA}, I_B = -10\text{mA}$
Base-Emitter Saturation Voltage		$V_{\text{BE}(\text{SAT})}$	—	-1.2	V $I_C = -100\text{mA}, V_{\text{CE}} = -1.0\text{V}$
SMALL SIGNAL CHARACTERISTICS					
Current Gain-Bandwidth Product		f_T	50	—	MHz $V_{\text{CE}} = -1.0\text{V}, I_C = -100\text{mA},$ $f = 100\text{MHz}$

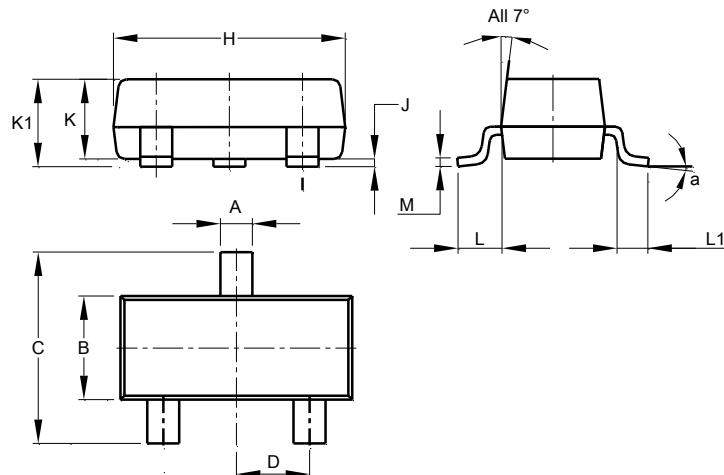
Note: 10. Measured under pulsed conditions. Pulse width $\leq 300\mu\text{s}$. Duty cycle $\leq 2\%$.

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



Package Outline Dimensions

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

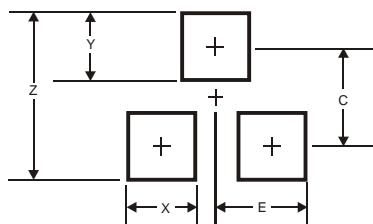


SOT23			
Dim	Min	Max	Typ
A	0.37	0.51	0.40
B	1.20	1.40	1.30
C	2.30	2.50	2.40
D	0.89	1.03	0.915
F	0.45	0.60	0.535
G	1.78	2.05	1.83
H	2.80	3.00	2.90
J	0.013	0.10	0.05
K	0.890	1.00	0.975
K1	0.903	1.10	1.025
L	0.45	0.61	0.55
L1	0.25	0.55	0.40
M	0.085	0.150	0.110
a	8°		

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)
Z	2.9
X	0.8
Y	0.9
C	2.0
E	1.35

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