

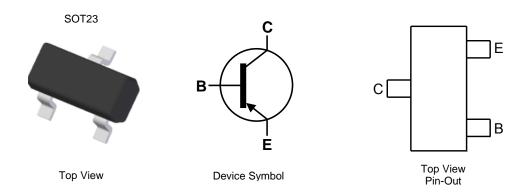
PNP SMALL SIGNAL TRANSISTOR IN SOT23

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 (€3)
- Weight: 0.008 grams (Approximate)



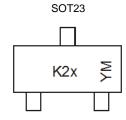
Ordering Information (Notes 4 & 5)

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:

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

Marking Information



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	С	D	Е	F	G	H		J	K	L	М	N
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Code	1	2	3	4	5	6	7	8	9	0	N	D



Absolute Maximum Ratings (@T_A = +25°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	Ic	-5	00	mA

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

Characteristic	Symbol	Value	Unit		
Power Dissipation	(Note 6)	D	310	mW	
Power Dissipation	(Note 7)	P _D	350	IIIVV	
Thermal Resistance, Junction to Ambient	(Note 6)	Б	403	°C/W	
Thermal Resistance, Junction to Ambient	(Note 7)	R _{0JA}	R _{0JA} 357		
Thermal Resistance, Junction to Leads (Note 8)		$R_{\theta JL}$	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	С

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.

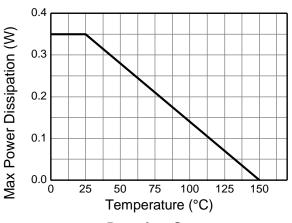
^{7.} Same as Note 6, except the device is mounted on 15 mm x 15mm 1oz copper.

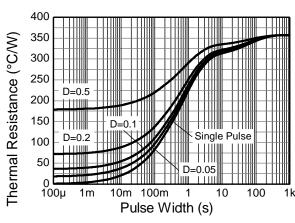
^{8.} Thermal resistance from junction to solder-point (at the end of the leads).

9. Refer to JEDEC specification JESD22-A114 and JESD22-A115.



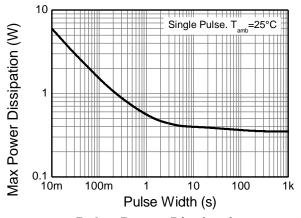
Thermal Characteristics and Derating Information





Derating Curve

Transient Thermal Impedance



Pulse Power Dissipation



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

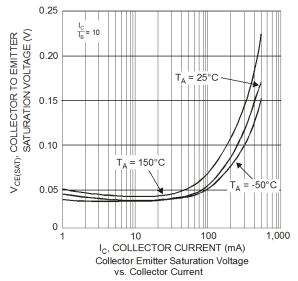
Characteristic			Min	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 10)						
Collector-Base Breakdown Voltage	MMBTA55 MMBTA56	BV _{CBO}	-60 -80	_	V	$I_C = -100\mu A, I_E = 0$
Collector-Emitter Breakdown Voltage MMBTA55 MMBTA56		BV _{CEO}	-60 -80	_	V	$I_C = -1.0 \text{mA}, I_B = 0$
Emitter-Base Breakdown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

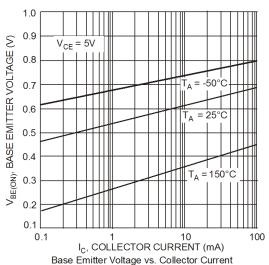
Note:

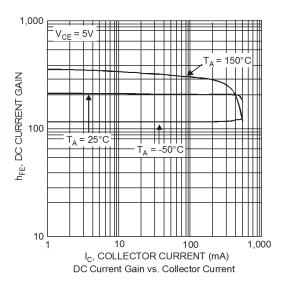
10. Measured under pulsed conditions. Pulse width \leq 300 μ s. Duty cycle \leq 2%.

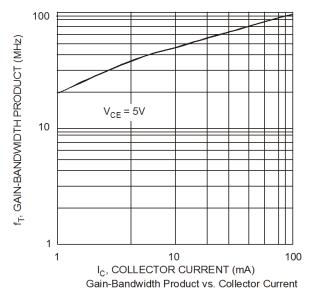


Typical Electrical Characteristics (@TA = +25°C, unless otherwise specified.)





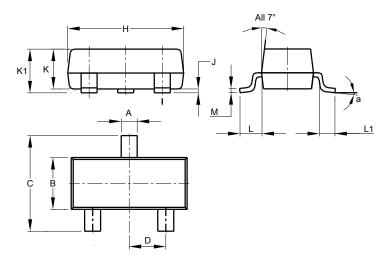






Package Outline Dimensions

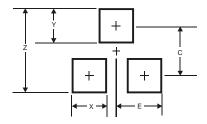
Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for the latest version.



SOT23						
Dim	Min	Max	Тур			
Α	0.37	0.51	0.40			
В	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			
М	0.085	0.150	0.110			
а	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
Х	0.8
Y	0.9
С	2.0
Е	1.35



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