

**70V PNP SILICON LOW SATURATION TRANSISTOR IN SOT23**

**Features**

- $BV_{CEO} > -70V$
- $I_C = -1.5A$  Continuous Collector Current
- $I_{CM} = -3A$  Peak Pulse Current
- Low Saturation Voltage  $V_{CE(sat)} < -220mV @ -1A$
- $R_{CE(SAT)} = 140m\Omega$  for a low equivalent on-resistance
- 625mW power dissipation
- $h_{FE}$  characterised up to -3A 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**
- **PPAP capable (Note 4)**

**Mechanical Data**

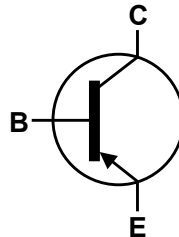
- Case: SOT23
- Case Material: molded plastic, "Green" molding compound
- UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish – Matte Tin Plated Leads, Solderable per MIL-STD-202, Method 208 **(e3)**
- Weight 0.008 grams (approximate)

**Applications**

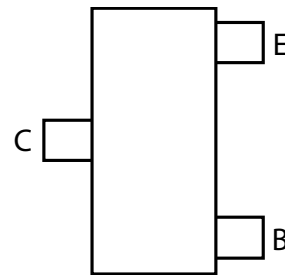
- High-side driver
- Load disconnect switch
- Motor drive



Top View



Device Symbol



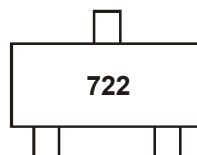
Top View  
Pin-Out

**Ordering Information** (Note 5)

Product	Compliance	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
FMMT722TA	AEC-Q101	722	7	8	3,000
FMMT722QTA	Automotive	722	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> 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. 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>

**Marking Information**



722 = Product Type Marking Code

**Maximum Ratings** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V <sub>CB0</sub>	-70	V
Collector-Emitter Voltage	V <sub>CEO</sub>	-70	V
Emitter-Base Voltage	V <sub>EBO</sub>	-7	V
Continuous Collector Current	I <sub>C</sub>	-1.5	A
Peak Pulse Current	I <sub>CM</sub>	-3	A
Base Current	I <sub>B</sub>	-500	mA

**Thermal Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

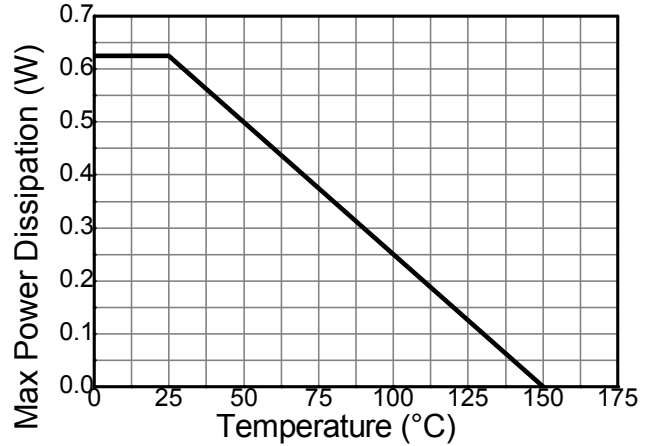
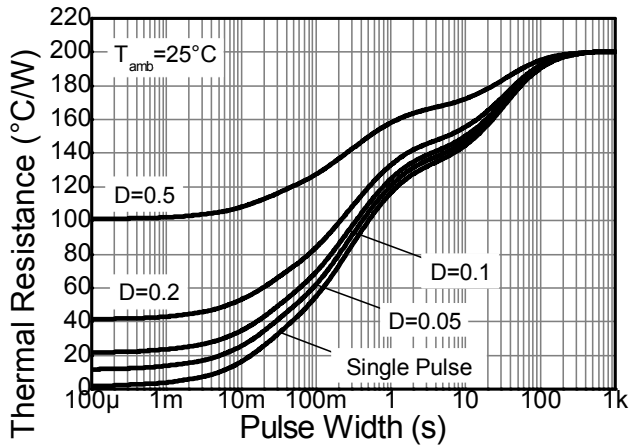
Characteristic	Symbol	Value	Unit
Power Dissipation (Note 6)	P <sub>D</sub>	625	mW
Power Dissipation (Note 7)	P <sub>D</sub>	806	mW
Thermal Resistance, Junction to Ambient (Note 6)	R <sub>θJA</sub>	200	°C/W
Thermal Resistance, Junction to Ambient (Note 7)	R <sub>θJA</sub>	155	°C/W
Thermal Resistance, Junction to Leads (Note 8)	R <sub>θJL</sub>	194	°C/W
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 to +150	°C

**ESD Ratings** (Note 9)

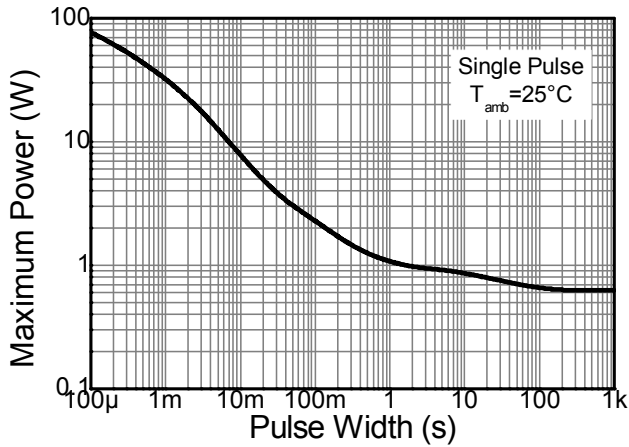
Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge - Human Body Model	ESD HBM	4,000	V	3A
Electrostatic Discharge - Machine Model	ESD MM	≥ 400	V	C

- Notes:
6. For a device surface mounted on 25mm X 25mm FR4 PCB with high coverage of single sided 1 oz copper, in still air conditions; the device is measured when operating in a steady-state condition.
  7. Same as note 6, except the device is measured at t ≤ 5 sec.
  8. Thermal resistance from junction to solder-point (at the end of the collector lead).
  9. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

**Thermal Characteristics and Derating information**

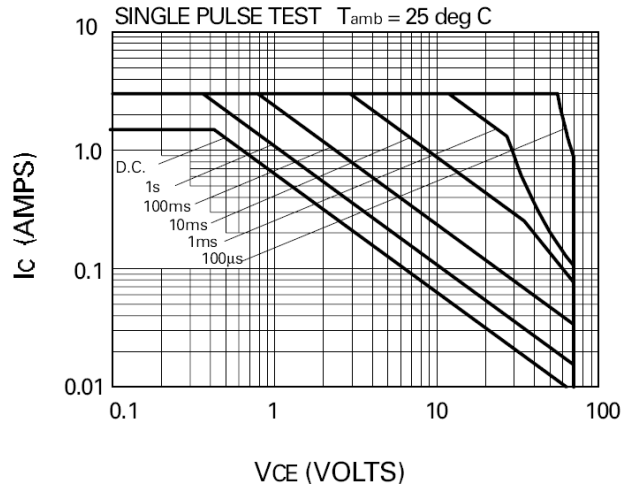


**Transient Thermal Impedance**



**Pulse Power Dissipation**

**Derating Curve**



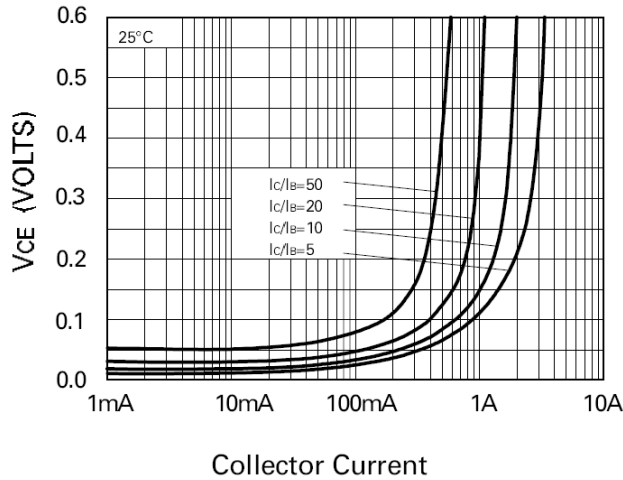
**Safe Operating Area**

**Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

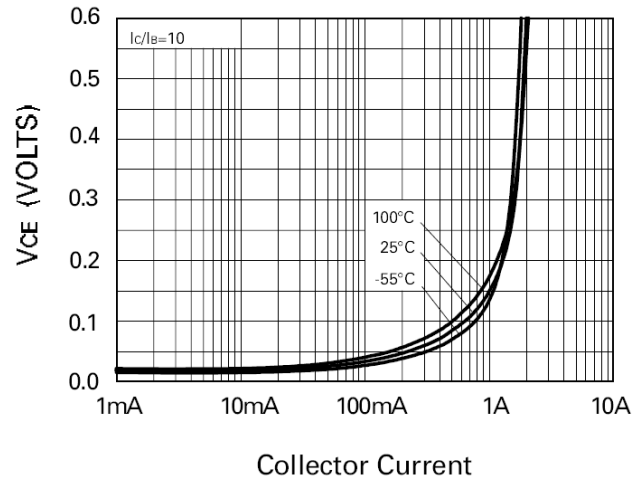
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV <sub>CBO</sub>	-70	-150	-	V	I <sub>C</sub> = -100μA
Collector-Emitter Breakdown Voltage (Note 10)	BV <sub>CEO</sub>	-70	-125	-	V	I <sub>C</sub> = -10mA
Emitter-Base Breakdown Voltage	BV <sub>EBO</sub>	-7	-8.8	-	V	I <sub>E</sub> = -100μA
Collector Cutoff Current	I <sub>CBO</sub>	-	<1	-100	nA	V <sub>CB</sub> = -60V
Emitter Cutoff Current	I <sub>EBO</sub>	-	<1	-100	nA	V <sub>EB</sub> = -5.6V
Collector Emitter Cutoff Current	I <sub>CES</sub>	-	<1	-100	nA	V <sub>CE</sub> = -60V
Static Forward Current Transfer Ratio (Note 10)	h <sub>FE</sub>	300	470	-	-	I <sub>C</sub> = -10mA, V <sub>CE</sub> = -5V
		300	450	-		I <sub>C</sub> = -0.1A, V <sub>CE</sub> = -5V
		175	275	-		I <sub>C</sub> = -1A, V <sub>CE</sub> = -5V
		40	60	-		I <sub>C</sub> = -1.5A, V <sub>CE</sub> = -5V
		-	10	-		I <sub>C</sub> = -3A, V <sub>CE</sub> = -5V
Collector-Emitter Saturation Voltage (Note 10)	V <sub>CE(sat)</sub>	-	-35	-50	mV	I <sub>C</sub> = -0.1A, I <sub>B</sub> = -10mA
		-	-135	-200		I <sub>C</sub> = -0.5A, I <sub>B</sub> = -20mA
		-	-140	-220		I <sub>C</sub> = -1A, I <sub>B</sub> = -100mA
		-	-175	-260		I <sub>C</sub> = -1.5A, I <sub>B</sub> = -200mA
Base-Emitter Turn-On Voltage(Note 10)	V <sub>BE(on)</sub>	-	-0.78	-1.0	V	I <sub>C</sub> = -1.5A, V <sub>CE</sub> = -5V
Base-Emitter Saturation Voltage(Note 10)	V <sub>BE(sat)</sub>	-	-0.94	-1.05	V	I <sub>C</sub> = -1.5A, I <sub>B</sub> = -200mA
Output Capacitance	C <sub>obo</sub>	-	14	20	pF	V <sub>CB</sub> = -10V, f = 1MHz
Transition Frequency	f <sub>T</sub>	150	200	-	MHz	V <sub>CE</sub> = -10V, I <sub>C</sub> = -50mA, f = 100MHz
Turn-On Time	t <sub>on</sub>	-	40	-	ns	V <sub>CC</sub> = -50V, I <sub>C</sub> = -0.5A
Turn-Off Time	t <sub>off</sub>	-	700	-	ns	I <sub>B1</sub> = I <sub>B2</sub> = -50mA

Notes: 10. Measured under pulsed conditions. Pulse width ≤ 300μs. Duty cycle ≤ 2%

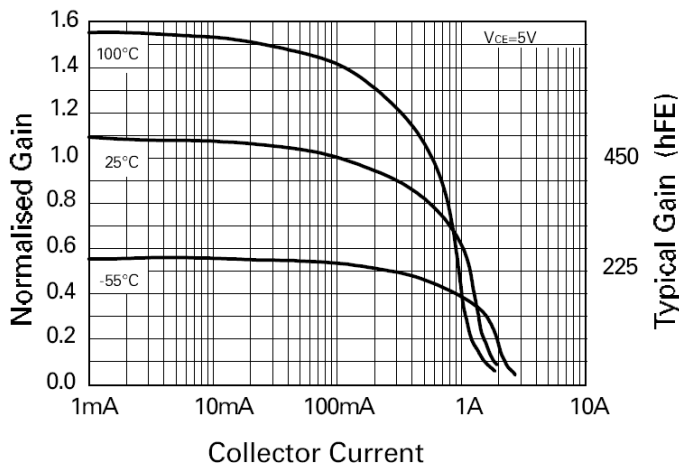
**Typical Electrical Characteristics** (@ $T_A = +25^\circ\text{C}$ , unless otherwise specified.)



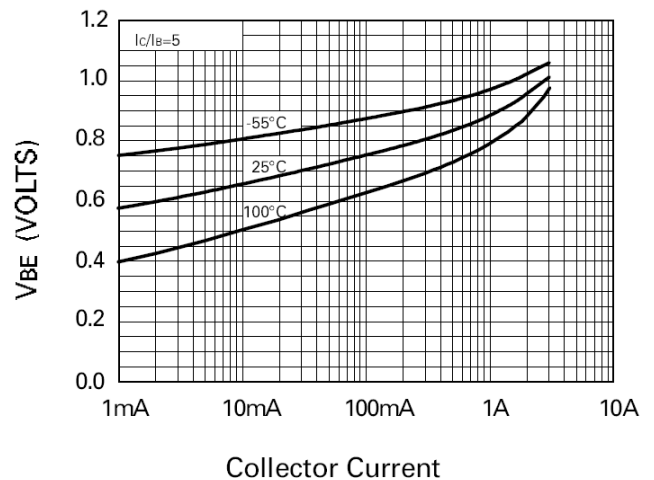
Collector Current  
 **$V_{BE(SAT)}$  vs  $I_C$**



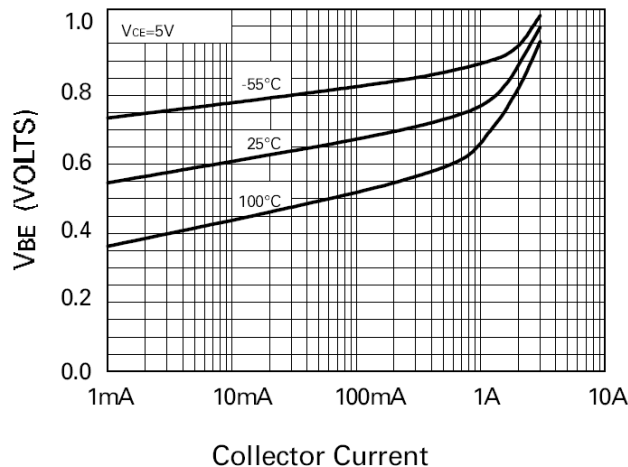
Collector Current  
 **$V_{CE(SAT)}$  vs  $I_C$**



Collector Current  
 **$h_{FE}$  vs  $I_C$**



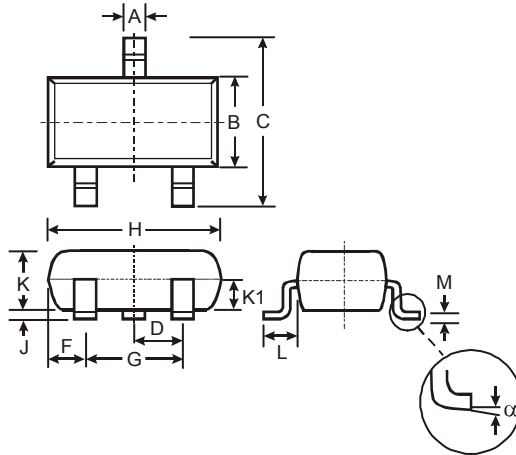
Collector Current  
 **$V_{BE(SAT)}$  vs  $I_C$**



Collector Current  
 **$V_{BE(ON)}$  vs  $I_C$**

## Package Outline Dimensions

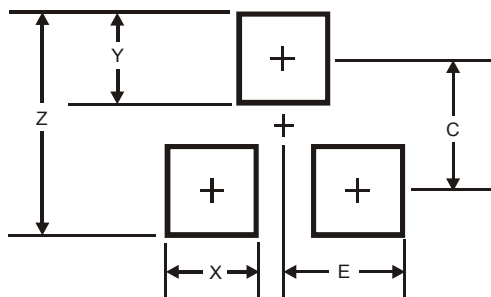
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for latest version.



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	0.903	1.10	1.00
K1	-	-	0.400
L	0.45	0.61	0.55
M	0.085	0.18	0.11
α	0°	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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