



**THE DATASHEET OF  
FMMT723QTA**




**100V PNP LOW SATURATION TRANSISTOR IN SOT23**

**Features**

- $BV_{CEO} > -100V$
- $I_C = -1A$  High Continuous Collector Current
- $I_{CM} = -2.5A$  Peak Pulse Current
- Low Saturation Voltage  $V_{CE(sat)} < -330mV @ -1A$
- $R_{CE(SAT)} = 210m\Omega$  for a Low Equivalent On-Resistance
- 625mW Power Dissipation
- $h_{FE}$  Characterized up to -1.5A for High Current Gain Hold-Up
- Complementary NPN Type: FMMT624
- **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**

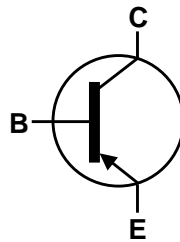
- Case: SOT23
- Case Material: Molded Plastic, "Green" Molding Compound; UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish – Matte Tin Plated Leads, Solderable per MIL-STD-202, Method 208 
- Weight 0.008 grams (Approximate)

**Applications**

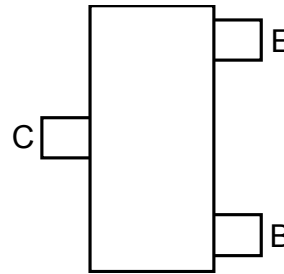
- High-Side Driver
- Load Disconnect Switch
- Motor Drive



Top View



Device Symbol



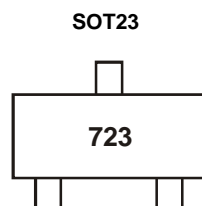
Top View  
Pin-Out

**Ordering Information** (Notes 4 & 5)

Product	Compliance	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
FMMT723TA	AEC-Q101	723	7	8	3,000
FMMT723QTA	Automotive	723	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](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. 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 more information, please refer to [http://www.diodes.com/quality/product\\_compliance\\_definitions/](http://www.diodes.com/quality/product_compliance_definitions/).
  5. For packaging details, go to our website at <http://www.diodes.com/products/packages.html>.

**Marking Information**



723 = Product Type Marking Code

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

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V <sub>CBO</sub>	-100	V
Collector-Emitter Voltage	V <sub>CEO</sub>	-100	V
Emitter-Base Voltage	V <sub>EBO</sub>	-7	V
Continuous Collector Current	I <sub>C</sub>	-1	A
Peak Pulse Current	I <sub>CM</sub>	-2.5	A
Base Current	I <sub>B</sub>	-500	mA

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

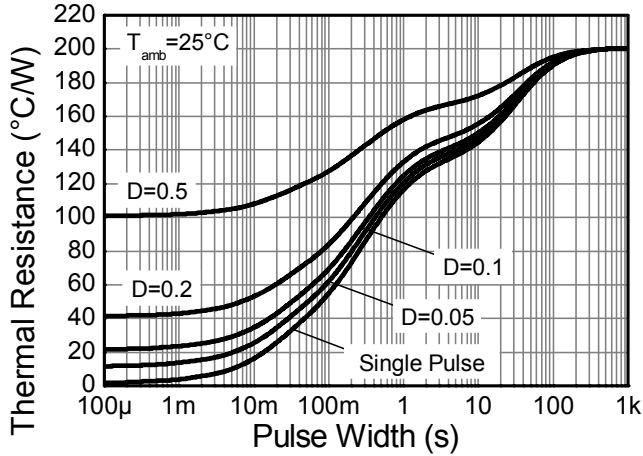
Characteristic	Symbol	Value	Unit
Power Dissipation (Note 6)	P <sub>D</sub>	625	mW
Power Dissipation (Note 7)	P <sub>D</sub>	806	mW
Thermal Resistance, Junction to Ambient (Note 6)	R <sub>θJA</sub>	200	°C/W
Thermal Resistance, Junction to Ambient (Note 7)	R <sub>θJA</sub>	155	°C/W
Thermal Resistance, 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)

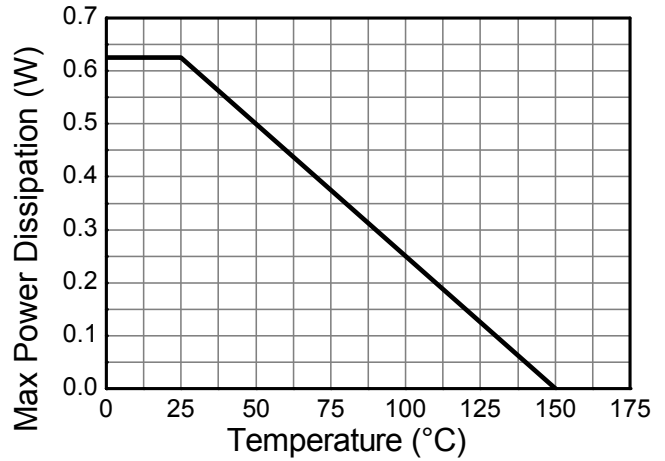
Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge - Human Body Model	ESD HBM	4,000	V	3A
Electrostatic Discharge - Machine Model	ESD MM	400	V	C

- Notes:
6. For a device surface mounted on 25mm x 25mm FR4 PCB with high coverage of single sided 1oz 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.

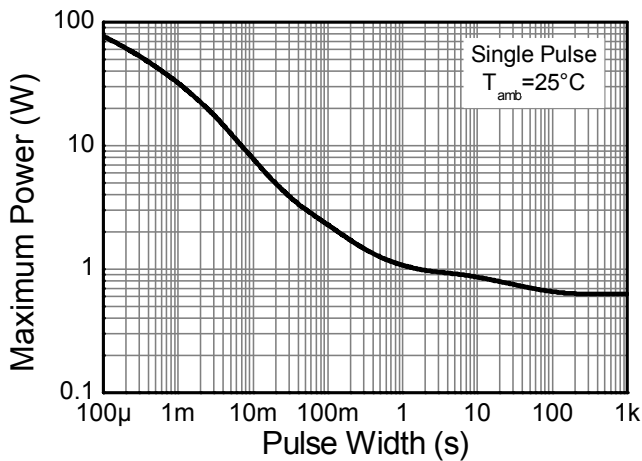
**Thermal Characteristics and Derating information**



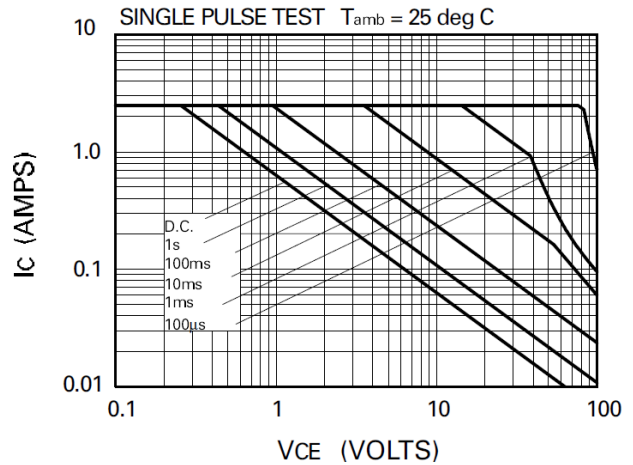
**Transient Thermal Impedance**



**Derating Curve**



**Pulse Power Dissipation**



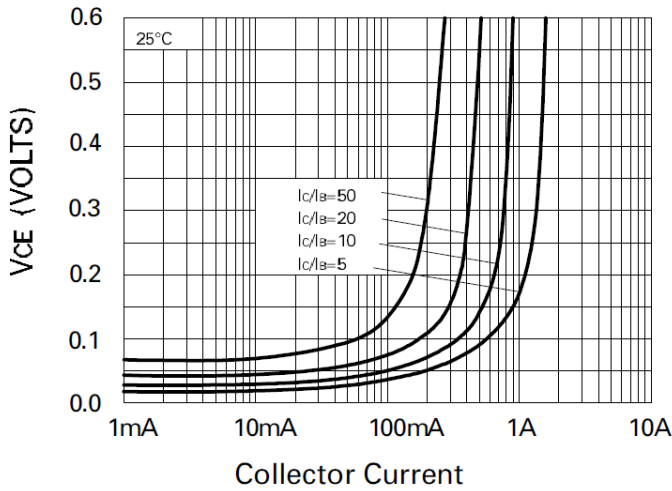
**Safe Operating Area**

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

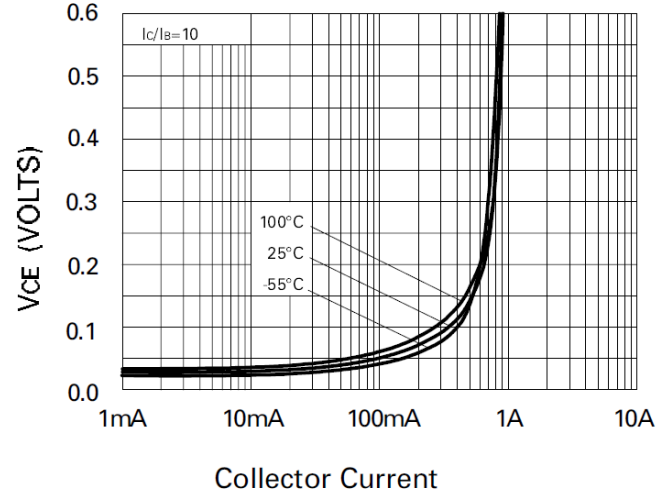
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	$BV_{CBO}$	-100	-200	-	V	$I_C = -100\mu\text{A}$
Collector-Emitter Breakdown Voltage (Note 10)	$BV_{CEO}$	-100	-160	-	V	$I_C = -10\text{mA}$
Emitter-Base Breakdown Voltage	$BV_{EBO}$	-7	-8.8	-	V	$I_E = -100\mu\text{A}$
Collector Cutoff Current	$I_{CBO}$	-	<1	-100	nA	$V_{CB} = -80\text{V}$
Emitter Cutoff Current	$I_{EBO}$	-	<1	-100	nA	$V_{EB} = -5.6\text{V}$
Collector Emitter Cutoff Current	$I_{CES}$	-	<1	-100	nA	$V_{CE} = -80\text{V}$
Static Forward Current Transfer Ratio (Note 10)	$h_{FE}$	300	475	-	-	$I_C = -10\text{mA}, V_{CE} = -10\text{V}$
		300	450	-		$I_C = -0.1\text{A}, V_{CE} = -10\text{V}$
		250	375	-		$I_C = -0.5\text{A}, V_{CE} = -10\text{V}$
		-	250	-		$I_C = -1\text{A}, V_{CE} = -10\text{V}$
Collector-Emitter Saturation Voltage (Note 10)	$V_{CE(sat)}$	-	-50	-80	mV	$I_C = -0.1\text{A}, I_B = -10\text{mA}$
		-	-125	-200		$I_C = -0.5\text{A}, I_B = -50\text{mA}$
		-	-210	-330		$I_C = -1\text{A}, I_B = -150\text{mA}$
Base-Emitter Turn-On Voltage (Note 10)	$V_{BE(on)}$	-	-0.71	-1.0	V	$I_C = -1\text{A}, V_{CE} = -10\text{V}$
Base-Emitter Saturation Voltage (Note 10)	$V_{BE(sat)}$	-	-0.89	-1.0	V	$I_C = -1\text{A}, I_B = -150\text{mA}$
Output Capacitance	$C_{obo}$	-	13	20	pF	$V_{CB} = -10\text{V}, f = 1\text{MHz}$
Transition Frequency	$f_T$	150	200	-	MHz	$V_{CE} = -10\text{V}, I_C = -50\text{mA}, f = 100\text{MHz}$
Turn-On Time	$t_{on}$	-	50	-	ns	$V_{CC} = -50\text{V}, I_C = -0.5\text{A}$
Turn-Off Time	$t_{off}$	-	760	-	ns	$I_{B1} = I_{B2} = -50\text{mA}$

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

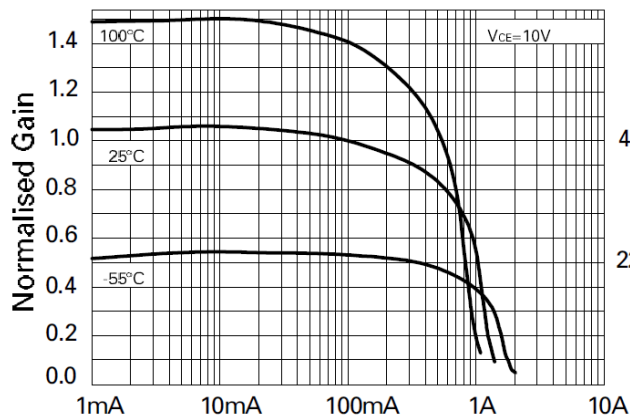
**Typical Electrical Characteristics** (@ $T_A = +25^\circ\text{C}$ , unless otherwise specified.)



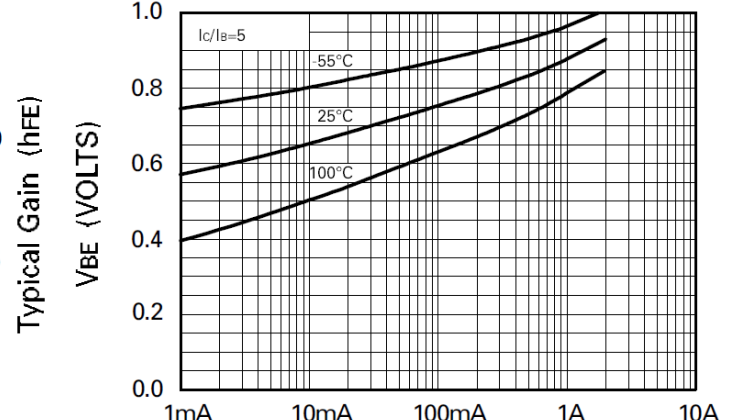
**VCE(SAT) vs IC**



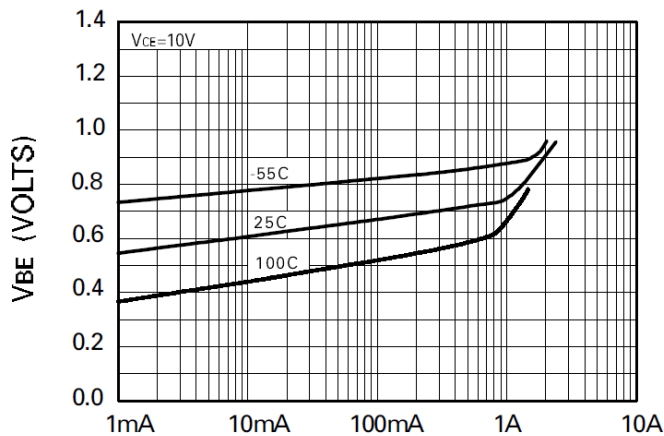
**VCE(SAT) vs IC**



**hFE vs IC**



**VBE(SAT) vs IC**

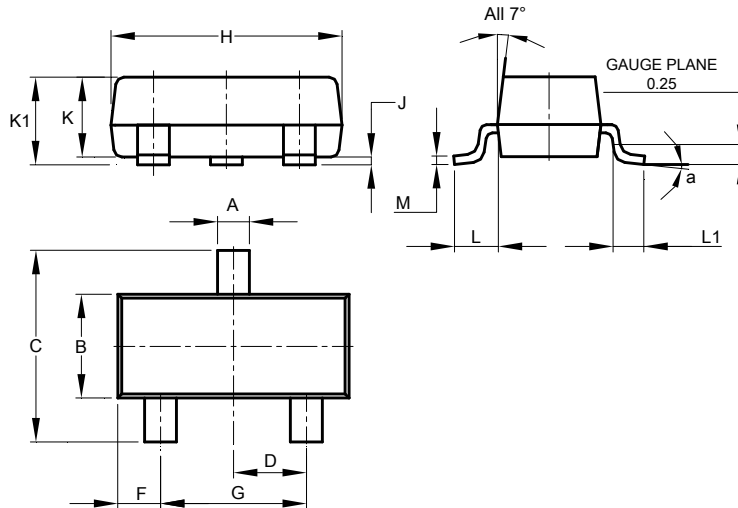


**VBE(ON) vs IC**

**VBE(ON) vs IC**

## Package Outline Dimensions

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

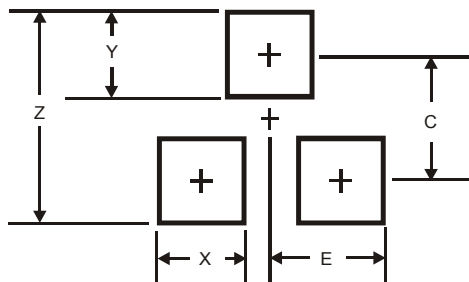


SOT23			
Dim	Min	Max	Typ
A	0.37	0.51	0.40
B	1.20	1.40	1.30
C	2.30	2.50	2.40
D	0.89	1.03	0.915
F	0.45	0.60	0.535
G	1.78	2.05	1.83
H	2.80	3.00	2.90
J	0.013	0.10	0.05
K	0.890	1.00	0.975
K1	0.903	1.10	1.025
L	0.45	0.61	0.55
L1	0.25	0.55	0.40
M	0.085	0.150	0.110
a	8°		
All Dimensions in mm			

## Suggested Pad Layout

Please see AP02001 at <http://www.diodes.com/datasheets/ap02001.pdf> for the latest version.

### SOT23



Dimensions	Value (in mm)
Z	2.9
X	0.8
Y	0.9
C	2.0
E	1.35

Note: For high voltage applications, the appropriate industry sector guidelines should be considered with regards to creepage and clearance distances between device terminals and PCB tracking.

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