

**15V NPN LOW SATURATION TRANSISTOR IN SOT23**

**Features**

- $BV_{CEO} > 15V$
- $I_C = 3A$  high Continuous Collector Current
- $I_{CM} = 12A$  Peak Pulse Current
- $R_{CE(sat)} = 50m\Omega$  for a low equivalent On-Resistance
- 625mW Power dissipation
- $h_{FE}$  specified up to 12A for high current gain hold up
- Complementary PNP Type: FMMT717
- **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**

**Mechanical Data**

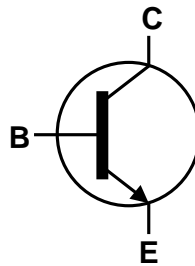
- Case: SOT23
- Case Material: molded plastic, "Green" molding compound
- UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish – Matte Tin Plated Leads, Solderable per MIL-STD-202, Method 208 (63)
- Weight 0.008 grams (approximate)

**Applications**

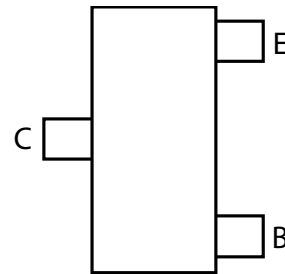
- DC-DC / DC-AC Modules
- Regulator
- LED driver
- CCFL Backlighting Inverters



Top View



Device Symbol



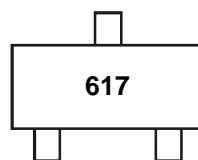
Top View  
Pin-Out

**Ordering Information** (Note 4)

Product	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
FMMT617TA	617	7	8	3,000
FMMT617TC	617	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> 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 <http://www.diodes.com>.

**Marking Information**



617 = 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>	15	V
Collector-Emitter Voltage	V <sub>CEO</sub>	15	V
Emitter-Base Voltage	V <sub>EBO</sub>	7	V
Continuous Collector Current	I <sub>C</sub>	3	A
Peak Pulse Current (Note 5)	I <sub>CM</sub>	12	A
Base Current	I <sub>B</sub>	500	mA

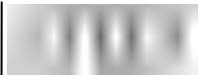
### Thermal Characteristics (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 5)	P <sub>D</sub>	625	mW
Power Dissipation (Note 6)	P <sub>D</sub>	806	mW
Thermal Resistance, Junction to Ambient (Note 5)	R <sub>θJA</sub>	200	°C/W
Thermal Resistance, Junction to Ambient (Note 6)	R <sub>θJA</sub>	155	°C/W
Thermal Resistance, Junction to Leads (Note 7)	R <sub>θJL</sub>	194	°C/W
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 to +150	°C

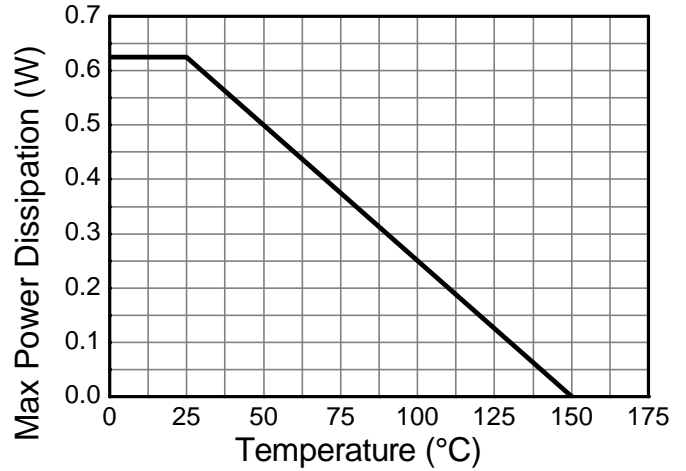
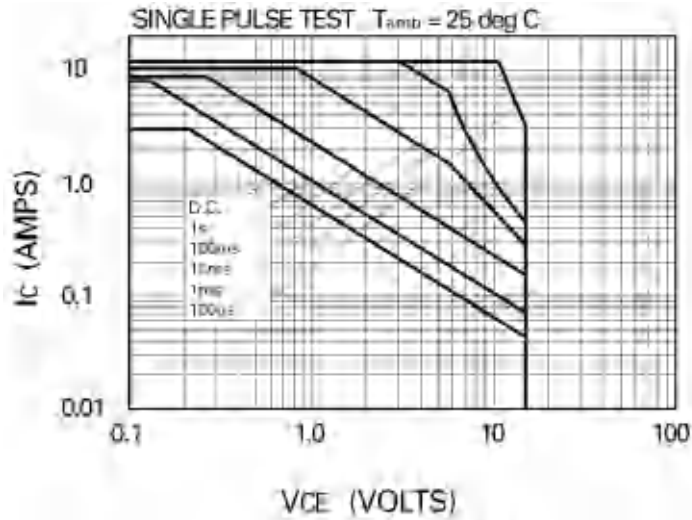
### ESD Ratings (Note 8)

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 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.
  6. Same as note 5, except the device is measured at t ≤ 5 sec.
  7. Thermal resistance from junction to solder-point (at the end of the collector lead).
  8. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

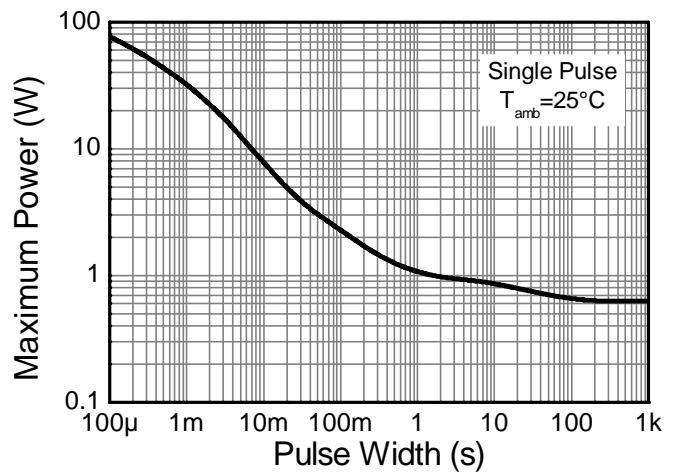
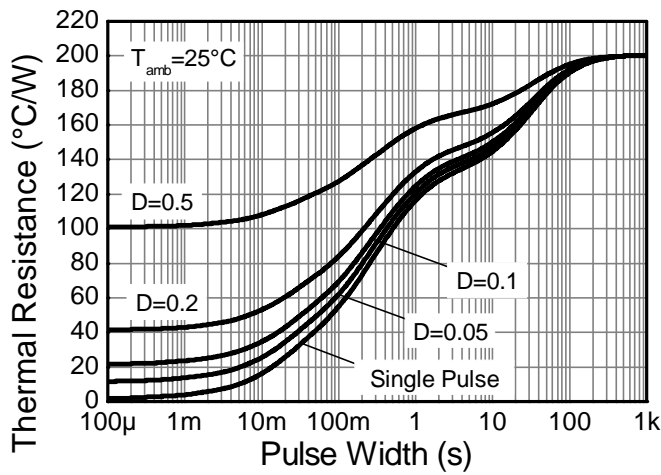


### Thermal Characteristics and Derating information



**Safe Operating Area**

**Derating Curve**



**Transient Thermal Impedance**

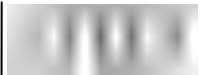
**Pulse Power Dissipation**



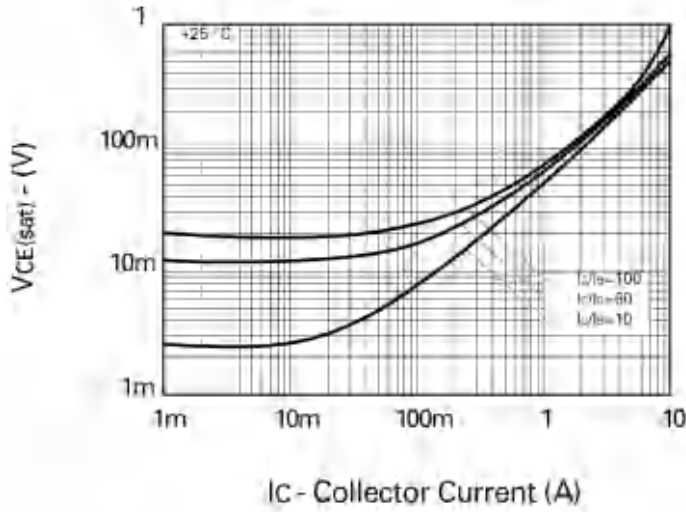
**Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV <sub>CBO</sub>	15	70	-	V	I <sub>C</sub> = 100μA
Collector-Emitter Breakdown Voltage (Note 9)	BV <sub>CEO</sub>	15	18	-	V	I <sub>C</sub> = 10mA
Emitter-Base Breakdown Voltage	BV <sub>EBO</sub>	7	8.2	-	V	I <sub>E</sub> = 100μA
Collector Cut-off Current	I <sub>CBO</sub>	-	<1	100	nA	V <sub>CB</sub> = 10V
Emitter Cut-off Current	I <sub>EBO</sub>	-	<1	100	nA	V <sub>EB</sub> = 5.6V
Collector Emitter Cut-off Current	I <sub>CES</sub>	-	<1	100	nA	V <sub>CES</sub> = 10V
Static Forward Current Transfer Ratio (Note 9)	h <sub>FE</sub>	200	415	-	-	I <sub>C</sub> = 10mA, V <sub>CE</sub> = 2V
		300	450	-		I <sub>C</sub> = 200mA, V <sub>CE</sub> = 2V
		200	320	-		I <sub>C</sub> = 3A, V <sub>CE</sub> = 2V
		150	240	-		I <sub>C</sub> = 5A, V <sub>CE</sub> = 2V
		-	80	-		I <sub>C</sub> = 12A, V <sub>CE</sub> = 2V
Collector-Emitter Saturation Voltage (Note 9)	V <sub>CE(sat)</sub>	-	8	14	mV	I <sub>C</sub> = 0.1A, I <sub>B</sub> = 10mA
		-	70	100		I <sub>C</sub> = 1A, I <sub>B</sub> = 10mA
		-	150	200		I <sub>C</sub> = 3A, I <sub>B</sub> = 50mA
Base-Emitter Saturation Voltage (Note 9)	V <sub>BE(sat)</sub>	-	0.9	1.0	V	I <sub>C</sub> = 3A, I <sub>B</sub> = 50mA
Base-Emitter Saturation Voltage (Note 9)	V <sub>BE(on)</sub>	-	0.84	1.0	V	I <sub>C</sub> = 3A, V <sub>CE</sub> = 2V
Transition Frequency	f <sub>T</sub>	80	120	-	MHz	I <sub>C</sub> = 50mA, V <sub>CE</sub> = 10V, f = 50MHz
Collector Output Capacitance	C <sub>obo</sub>	-	30	40	pF	V <sub>CB</sub> = 10V, f = 1MHz
Turn-On Time	t <sub>(on)</sub>	-	120	-	ns	V <sub>CC</sub> = 10V, I <sub>C</sub> = 3A,
Turn-Off Time	t <sub>(off)</sub>	-	160	-	ns	I <sub>B1</sub> = -I <sub>B2</sub> = 50mA

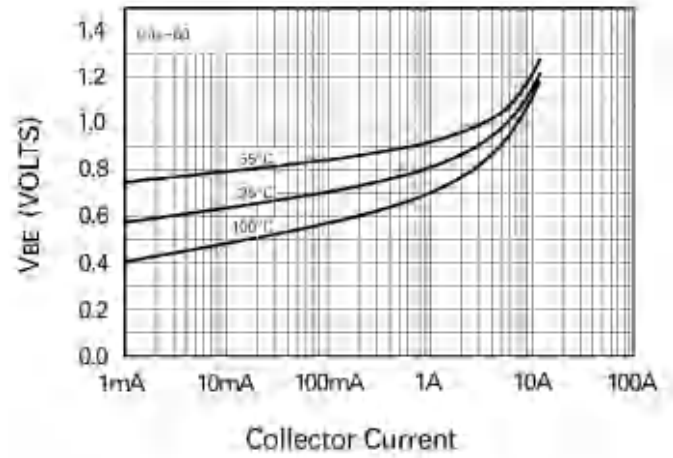
Notes: 9. Measured under pulsed conditions. Pulse width ≤ 300μs. Duty cycle ≤ 2%



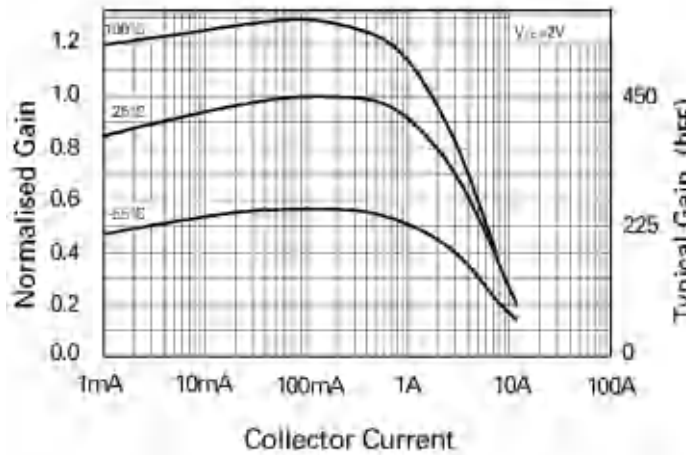
**Typical Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)



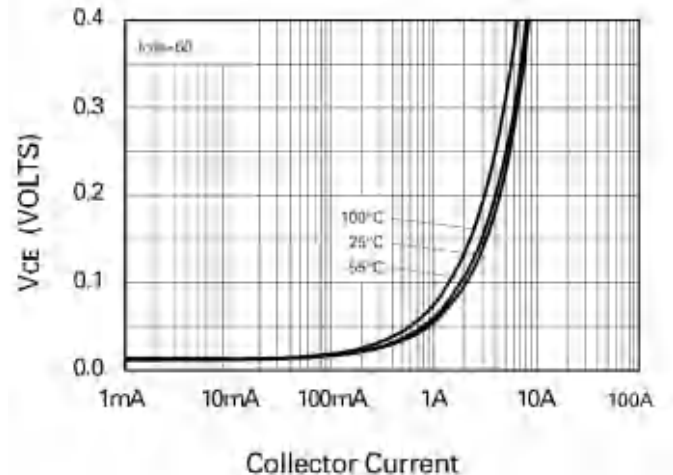
**VCE(SAT) v IC**



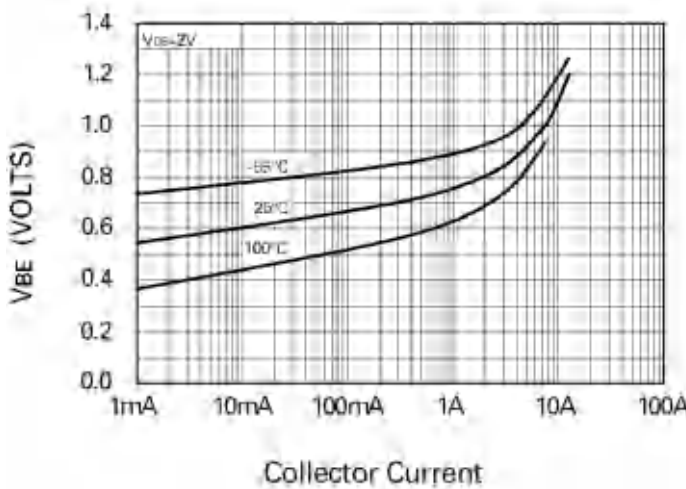
**VBE(SAT) vs IC**



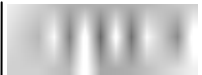
**hFE vs IC**



**VCE(SAT) vs IC**

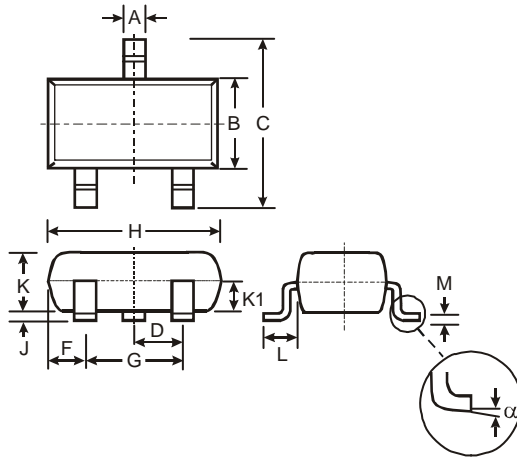


**VBE(ON) vs IC**



## Package Outline Dimensions

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

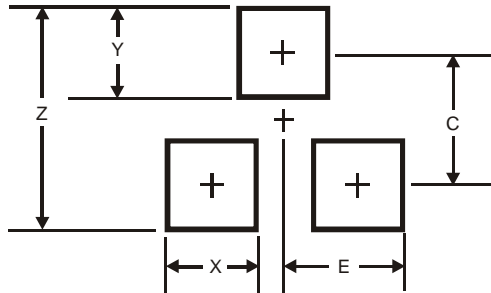


SOT23			
Dim	Min	Max	Typ
A	0.37	0.51	0.40
B	1.20	1.40	1.30
C	2.30	2.50	2.40
D	0.89	1.03	0.915
F	0.45	0.60	0.535
G	1.78	2.05	1.83
H	2.80	3.00	2.90
J	0.013	0.10	0.05
K	0.903	1.10	1.00
K1	-	-	0.400
L	0.45	0.61	0.55
M	0.085	0.18	0.11
α	0°	8°	-

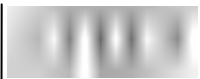
All Dimensions in mm

## 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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