

15V NPN LOW SATURATION TRANSISTOR IN SOT23
Features

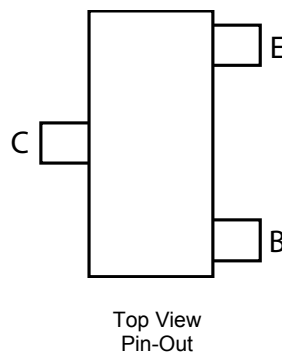
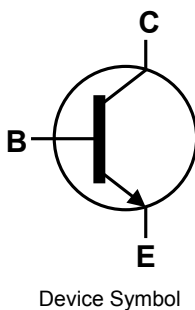
- $BV_{CEO} > 15V$
- $I_C = 3A$ high Continuous Collector Current
- $I_{CM} = 12A$ Peak Pulse Current
- $R_{CE(sat)} = 50m\Omega$ for a low equivalent On-Resistance
- 625mW Power dissipation
- h_{FE} specified up to 12A for high current gain hold up
- Complementary PNP Type: FMMT717
- **Totally Lead-Free & 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 
- Weight 0.008 grams (approximate)

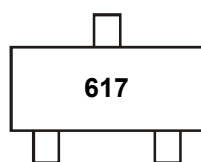
Applications

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


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_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V _{CBO}	15	V
Collector-Emitter Voltage	V _{CEO}	15	V
Emitter-Base Voltage	V _{EBO}	7	V
Continuous Collector Current	I _C	3	A
Peak Pulse Current (Note 5)	I _{CM}	12	A
Base Current	I _B	500	mA

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

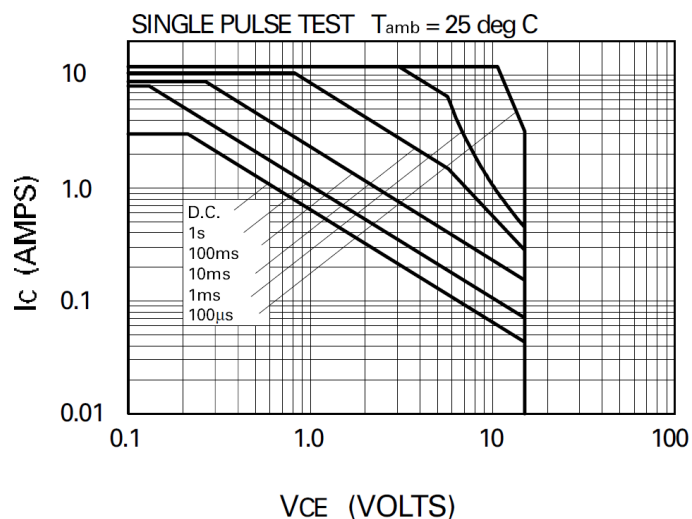
Characteristic	Symbol	Value	Unit
Power Dissipation (Note 5)	P _D	625	mW
Power Dissipation (Note 6)	P _D	806	mW
Thermal Resistance, Junction to Ambient (Note 5)	R _{θJA}	200	°C/W
Thermal Resistance, Junction to Ambient (Note 6)	R _{θJA}	155	°C/W
Thermal Resistance, Junction to Leads (Note 7)	R _{θJL}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

ESD Ratings (Note 8)

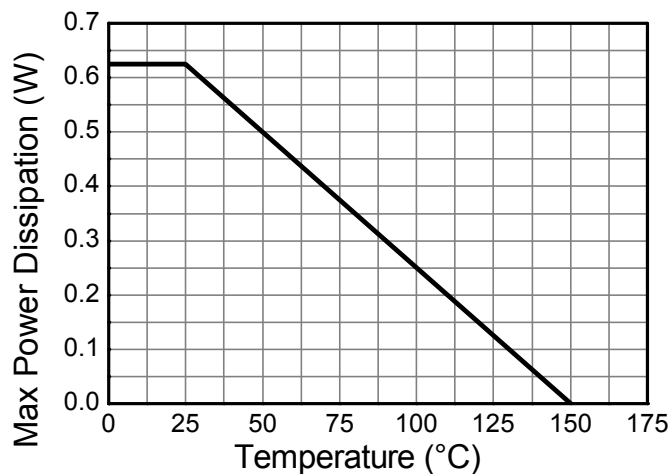
Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge - Human Body Model	ESD HBM	4,000	V	3A
Electrostatic Discharge - Machine Model	ESD MM	≥ 400	V	C

- 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.

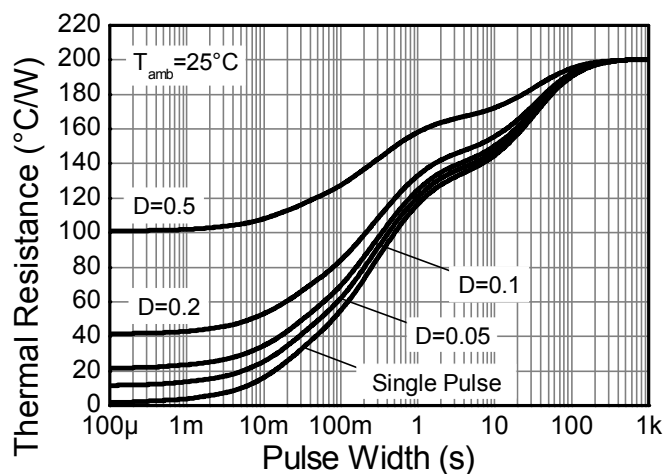
Thermal Characteristics and Derating information



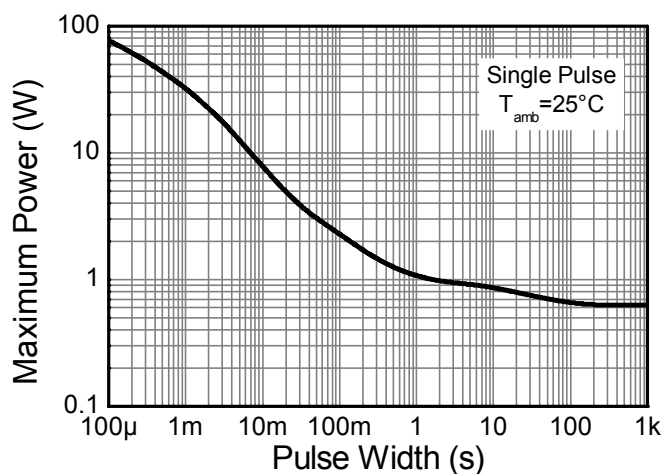
Safe Operating Area



Derating Curve



Transient Thermal Impedance



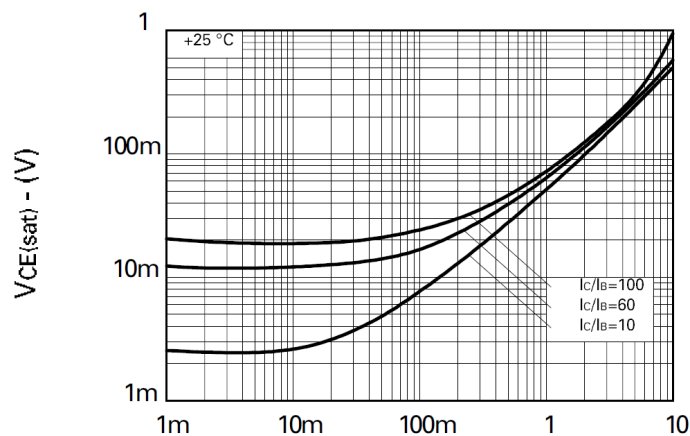
Pulse Power Dissipation

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

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

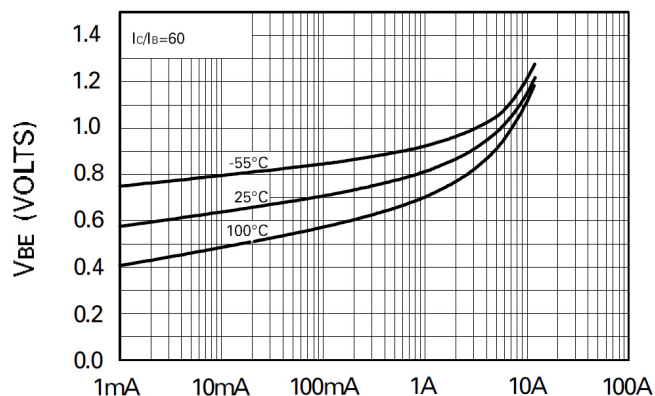
Notes: 9. Measured under pulsed conditions. Pulse width ≤ 300μs. Duty cycle ≤ 2%

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



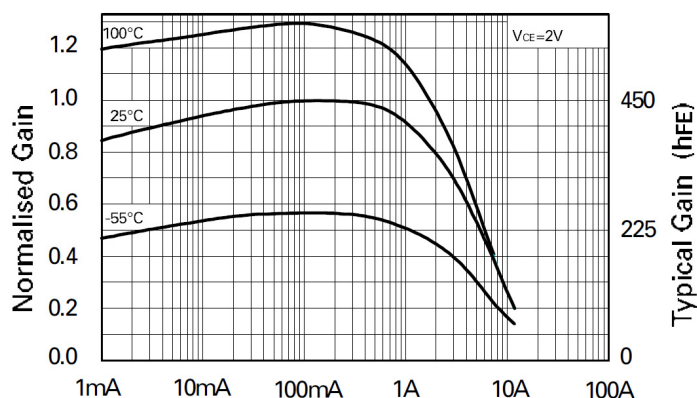
I_C - Collector Current (A)

$V_{CE(SAT)}$ v I_C



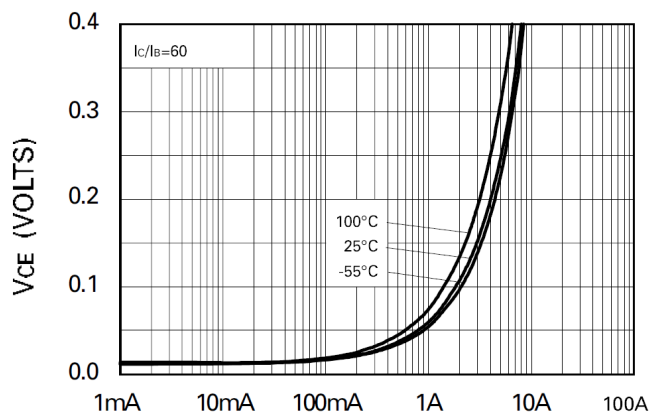
Collector Current

$V_{BE(SAT)}$ vs I_C



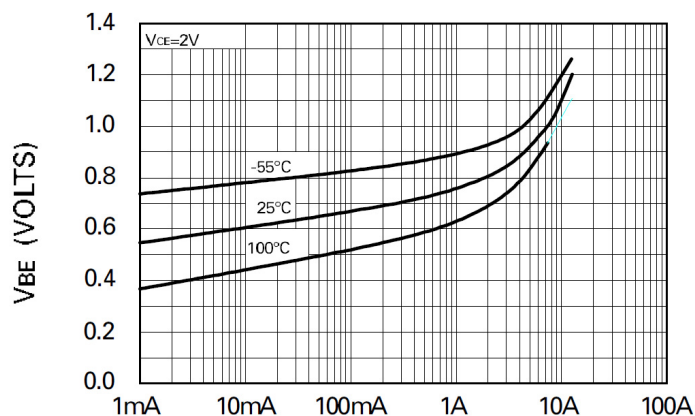
Collector Current

hFE vs I_C



Collector Current

$V_{CE(SAT)}$ vs I_C

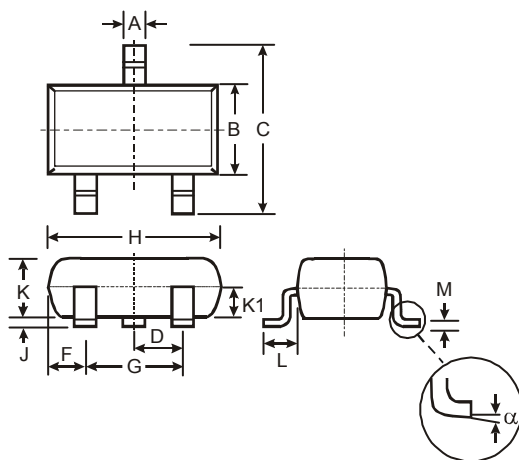


Collector Current

$V_{BE(ON)}$ vs I_C

Package Outline Dimensions

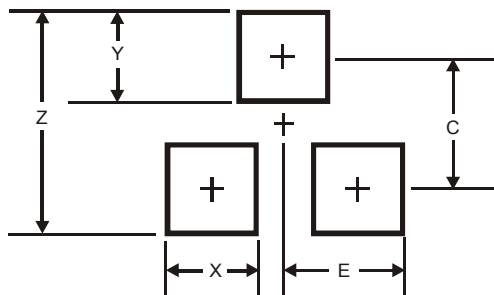
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for latest version.



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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