12V PNP SILICON LOW SATURATION TRANSISTOR IN SOT23

Features

- BV_{CEO} > -12V
- I_C = -2.5A Continuous Collector Current
- I_{CM} = -10A Peak Pulse Current
- Low Saturation Voltage E.g. -17mV Max @ I_C = -100mA.
- $R_{CE(sat)}$ = 72mΩ at 2.5A for a low equivalent on-resistance
- 625mW power dissipation
- h_{FE} characterized up to -10A for high current gain hold-up
- Complementary NPN Type: FMMT617
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **An automotive-compliant part is available under separate datasheet (FMMT717Q)**

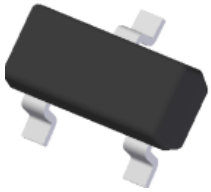
Mechanical Data

- Package: SOT23
- Package 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)

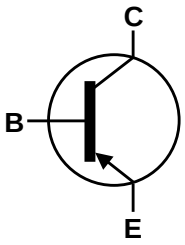
Application

- Gate-driving MOSFETs and IGBTs
- Load switches
- Battery charging
- DC-DC conversion

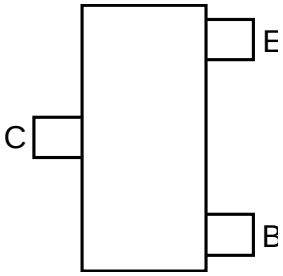
SOT23



Top View



Device Symbol



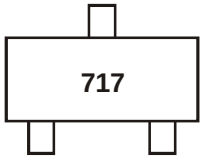
Top View
Pin-Out

Ordering Information (Note 4)

Orderable Part Number	Package	Marking	Reel size (inches)	Tape width (mm)	Packing	
					Qty.	Carrier
FMMT717TA	SOT23	717	7	8	3,000	Reel

Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
2. See https://www.diodes.com/quality/lead-free/ 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 https://www.diodes.com/design/support/packaging/diodes-packaging/.

Marking Information



717 = Product type Marking Code

Maximum Ratings (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	-12	V
Collector-Emitter Voltage	V_{CEO}	-12	V
Emitter-Base Voltage	V_{EBO}	-7	V
Continuous Collector Current	I_C	-2.5	A
Peak Pulse Current	I_{CM}	-10	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)	$R_{\theta JA}$	200	°C/W
Thermal Resistance, Junction to Ambient (Note 6)	$R_{\theta JA}$	155	°C/W
Thermal Resistance, Junction to Leads (Note 7)	$R_{\theta JL}$	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

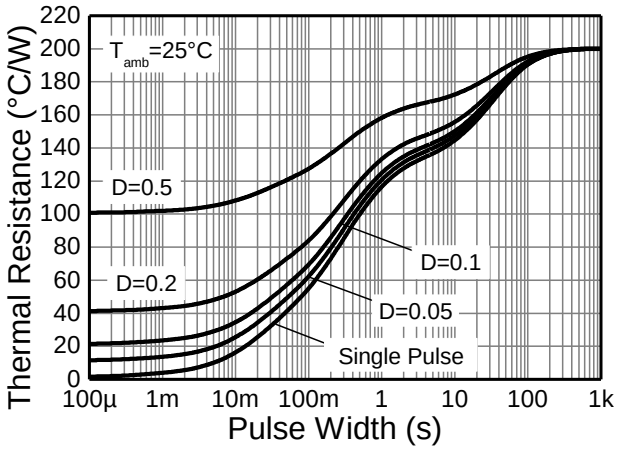


Figure 1. Transient Thermal Impedance

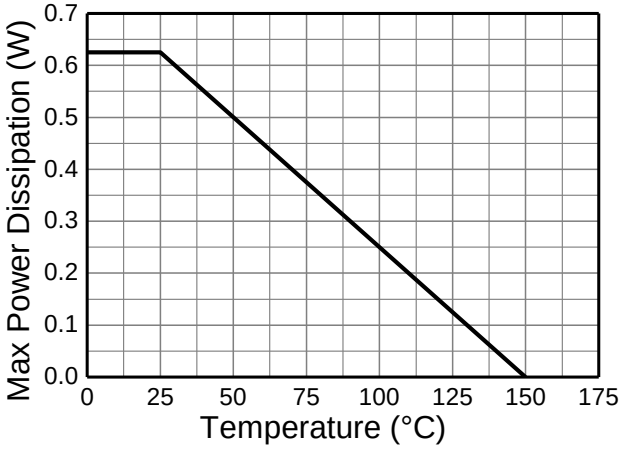


Figure 2. Derating Curve

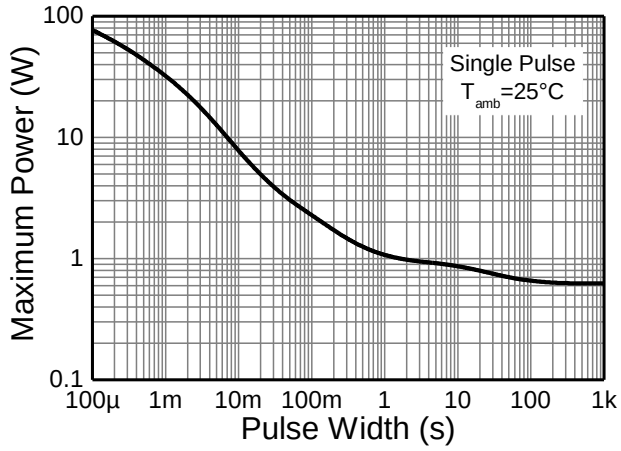


Figure 3. Pulse Power Dissipation

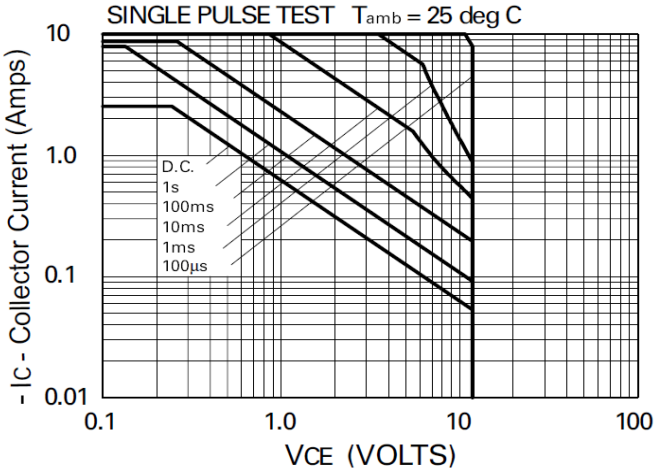


Figure 4. Safe Operating Area

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV_{CBO}	-12	-35	-	V	I_C = -100µA
Collector-Emitter Breakdown Voltage (Note 9)	BV_{CEO}	-12	-25	-	V	I_C = -10mA
Emitter-Base Breakdown Voltage	BV_{EBO}	-7	-8.5	-	V	I_E = -100µA
Collector Cutoff Current	I_{CBO}	-	-	-100	nA	V_{CB} = -10V
Emitter Cutoff Current	I_{EBO}	-	-	-100	nA	V_{EB} = -5V
Collector Emitter Cutoff Current	I_{CES}	-	-	-100	nA	V_{CE} = -10V
Static Forward Current Transfer Ratio (Note 9)	h_{FE}	300 300 180 60 45	475 450 275 100 70	- - - - -	-	I_C = -10mA, V_{CE} = -2V I_C = -100mA, V_{CE} = -2V I_C = -2.5A, V_{CE} = -2V I_C = -8A, V_{CE} = -2V I_C = -10A, V_{CE} = -2V
Collector-Emitter Saturation Voltage (Note 9)	$V_{CE(sat)}$	- - - - -	-10 -100 -110 -180	-17 -140 -170 -220	mV	I_C = -0.1A, I_B = -10mA I_C = -1A, I_B = -10mA I_C = -1.5A, I_B = -50mA I_C = -2.5A, I_B = -50mA
Base-Emitter Turn-On Voltage (Note 9)	$V_{BE(on)}$	-	-0.8	-1.0	V	I_C = -2.5A, V_{CE} = -2V
Base-Emitter Saturation Voltage (Note 9)	$V_{BE(sat)}$	-	-0.9	-1.0	V	I_C = -2.5A, I_B = -50mA
Output Capacitance	C_{obo}	-	40	50	pF	V_{CB} = -10V, f = 1MHz
Transition Frequency	f_T	80	110	-	MHz	V_{CE} = -10V, I_C = -50mA, f = 100MHz
Turn-On Time	t_{on}	-	70	-	ns	V_{CC} = -6V, I_C = -2A
Turn-Off Time	t_{off}	-	130	-	ns	I_{B1} = I_{B2} = 50mA

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

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

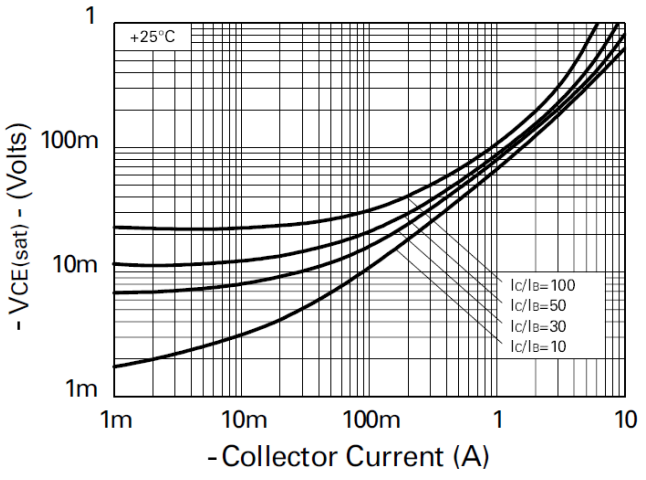


Figure 5. $V_{CE(sat)}$ v I_C

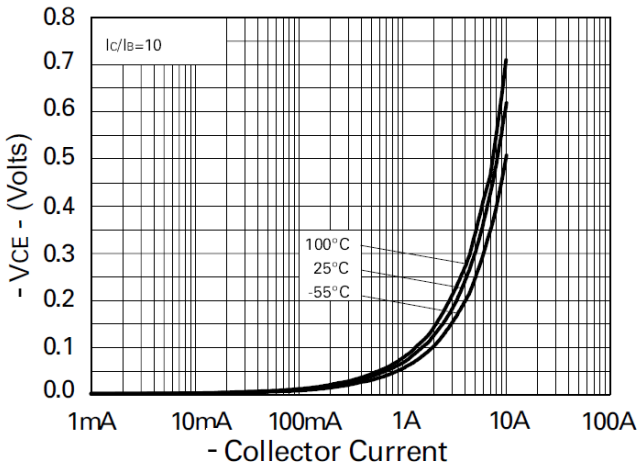


Figure 6. $V_{CE(sat)}$ v I_C

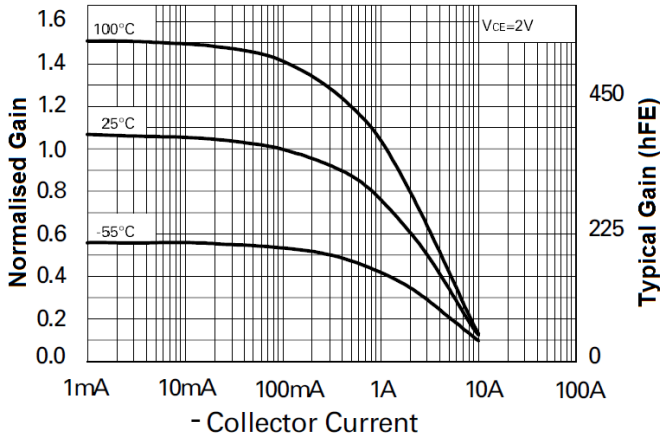


Figure 7. H_{FE} v I_C

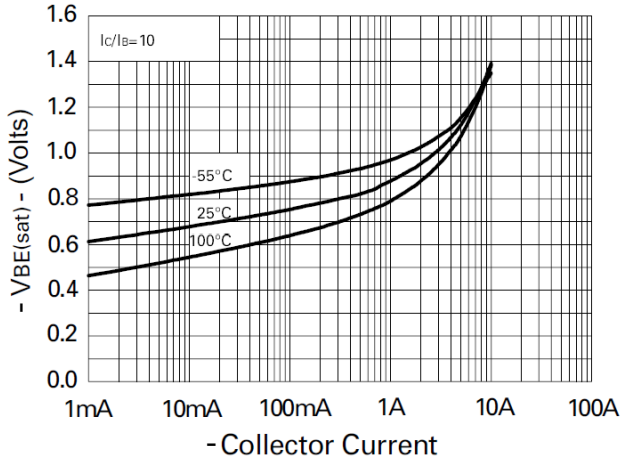


Figure 8. $V_{BE(sat)}$ v I_C

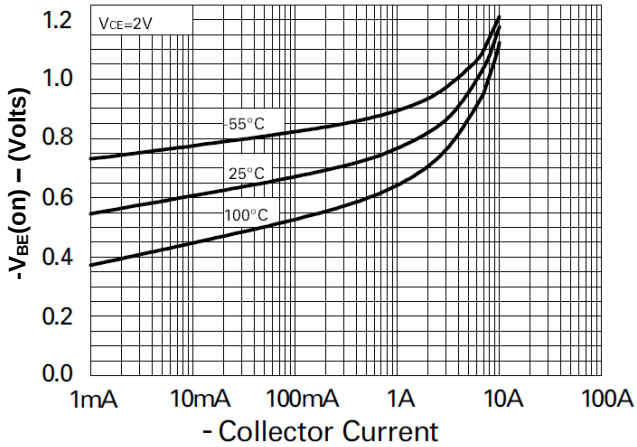
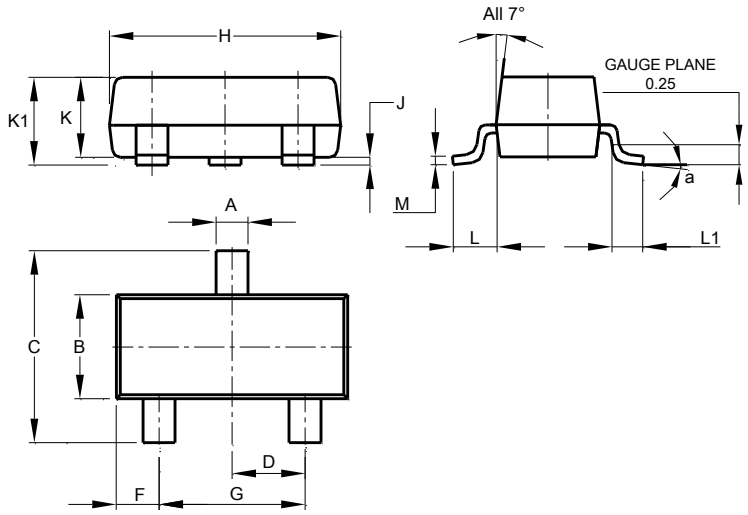


Figure 9. $V_{BE(on)}$ vs Ic

Package Outline Dimensions

Please see https://www.diodes.com/design/support/packaging/ for the latest version.

SOT23

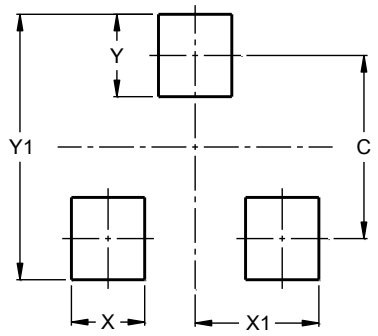


SOT23			
Dim	**Min**	**Max**	**Typ**
A	0.37	0.51	0.40
B	1.20	1.40	1.30
C	2.30	2.50	2.40
D	0.89	1.03	0.915
F	0.45	0.60	0.535
G	1.78	2.05	1.83
H	2.80	3.00	2.90
J	0.013	0.10	0.05
K	0.890	1.00	0.975
K1	0.903	1.10	1.025
L	0.45	0.61	0.55
L1	0.25	0.55	0.40
M	0.085	0.150	0.110
a	0°	8°	--
All Dimensions in mm			

Suggested Pad Layout

Please see https://www.diodes.com/design/support/packaging/ for the latest version.

SOT23



Dimensions	Value (in mm)
C	2.0
X	0.8
X1	1.35
Y	0.9
Y1	2.9

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