FMMTL717

12V PNP HIGH GAIN MEDIUM POWER TRANSISTOR IN SOT23

Features

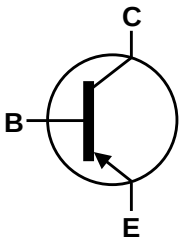
- BV_{CEO} > -12V
- I_C = -1.25A Continuous Collector Current
- I_{CM} = -4A Peak Pulse Current
- Low Saturation Voltage $V_{CE(sat)}$ < -240mV @ -1A
- $R_{CE(SAT)}$ = 160mΩ for a low equivalent on-resistance
- 500mW power dissipation
- h_{FE} characterised up to -3A for high current gain hold-up
- **Totally 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

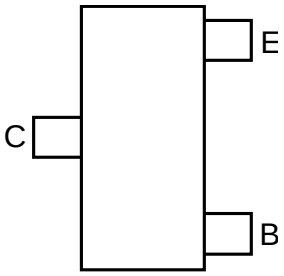
- Case: SOT23
- Case Material: Molded Plastic, "Green" Molding Compound UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish – Matte Tin Plated Leads. Solderable per MIL-STD-202, Method 208 e3
- Weight 0.008 grams (approximate)

SOT23

Top View



Device Symbol



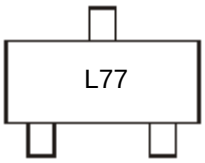
Top View
Pin-Out

Ordering Information (Notes 4 & 5)

Product	Compliance	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
FMMTL717TA	AEC-Q101	L77	7	8	3,000
FMMTL717QTA	Automotive	L77	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/products/packages.html.

Marking Information



L77 = Product Type Marking Code

Absolute 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	-1.25	A
Peak Pulse Current	I_{CM}	-4	A
Base Current	I_B	-200	mA

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

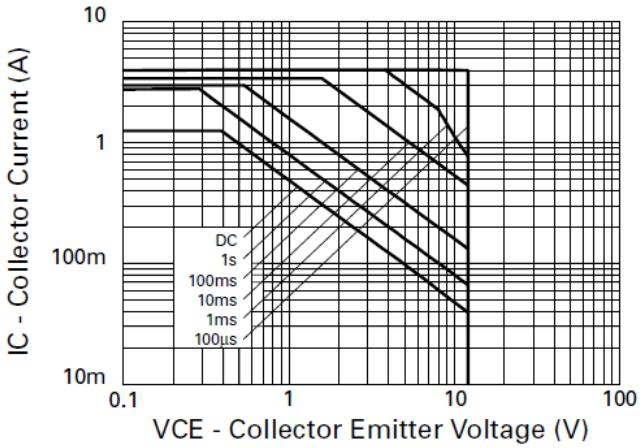
Characteristic		Symbol	Value	Unit
Power Dissipation	(Note 6)	P_D	500	mW
Thermal Resistance, Junction to Ambient	(Note 6)	$R_{\theta JA}$	250	°C/W
Thermal Resistance, Junction to Lead	(Note 7)	$R_{\theta JL}$	197	°C/W
Operating and Storage Temperature Range		T_J, T_{STG}	-55 to +150	°C

ESD Ratings (Note 8)

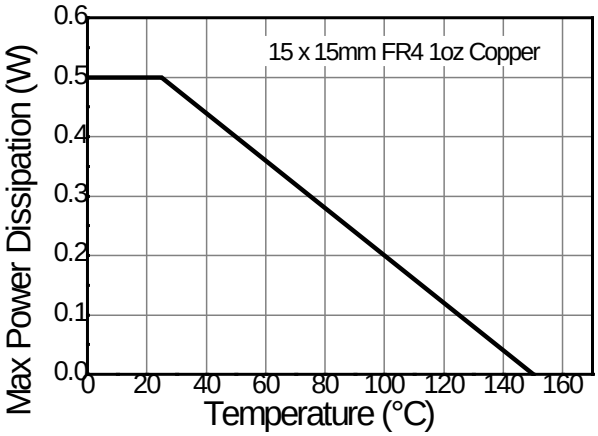
Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge - Human Body Model	ESD HBM	4,000	V	3A
Electrostatic Discharge - Machine Model	ESD MM	400	V	C

Notes:
6. For a device mounted with the collector lead on 15mm x 15mm 1oz copper that is on a single-sided FR4 PCB; device is measured under still air conditions whilst operating in a steady-state.
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.

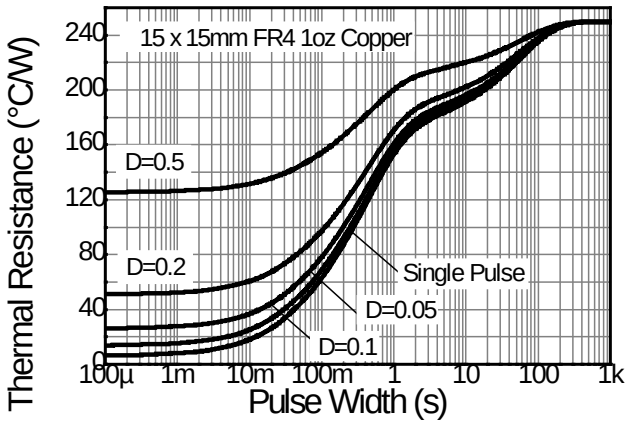
Thermal Characteristics and Derating information



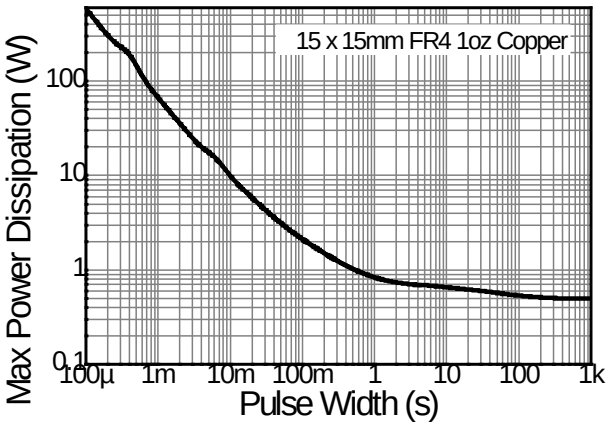
Safe Operating Area



Derating Curve



Transient Thermal Impedance



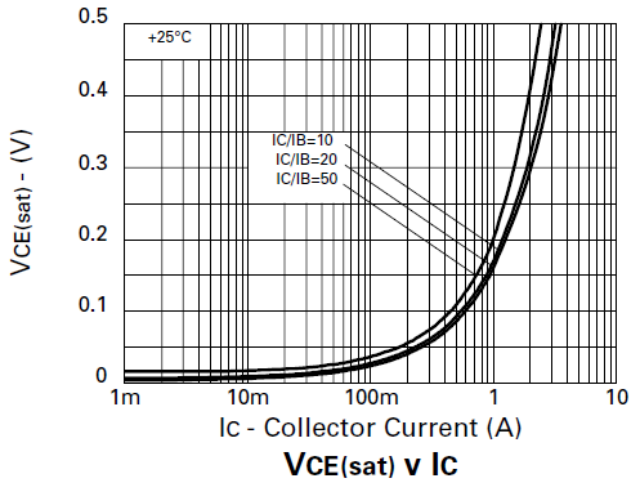
Pulse Power Dissipation

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

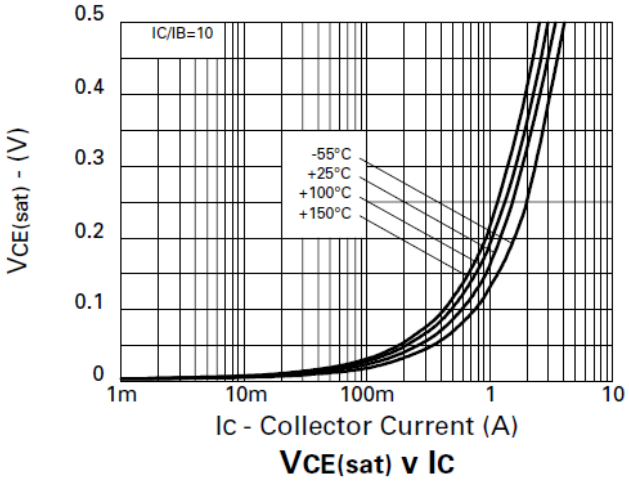
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV_{CBO}	-12	-35	-	V	I_C = -100µA
Collector-Emitter Breakdown Voltage (Note 9)	BV_{CEO}	-12	-25	-	V	I_C = -10mA
Emitter-Base Breakdown Voltage	BV_{EBO}	-7	-8.5	-	V	I_E = -100µA
Collector Cutoff Current	I_{CBO}	-	<-1	-10	nA	V_{CB} = -10V
Emitter Cutoff Current	I_{EBO}	-	<-1	-10	nA	V_{EB} = -5.6V
Collector Emitter Cutoff Current	I_{CES}	-	<-1	-10	nA	V_{CE}= -10V
Static Forward Current Transfer Ratio (Note 9)	h_{FE}	300	490	-	-	I_C = -10mA, V_{CE} = -2V
		300	450	-		I_C = -0.1A, V_{CE} = -2V
		180	275	-		I_C = -1A, V_{CE} = -2V
		100	180	-		I_C = -2A, V_{CE} = -2V
		50	110	-		I_C = -3A, V_{CE} = -2V
Collector-Emitter Saturation Voltage (Note 9)	$V_{CE(sat)}$	-	-24	-40	mV	I_C =- 0.1A, I_B = -10mA
		-	-94	-140	mV	I_C =- 0.5A, I_B = -20mA
		-	-160	-240	mV	I_C = -1A, I_B = -50mA
		-	-200	-290	mV	I_C = -1.25A, I_B = -50mA
Base-Emitter Turn-On Voltage(Note 9)	$V_{BE(on)}$	-	-875	-1000	mV	I_C = -1.25A, V_{CE} = -2V
Base-Emitter Saturation Voltage(Note 9)	$V_{BE(sat)}$	-	-970	-1100	mV	I_C = -1.25A, I_B = -50mA
Output Capacitance	C_{obo}	-	15	20	pF	V_{CB} = -10V, f = 1MHz
Transition Frequency	f_T	-	205	-	MHz	V_{CE} = -10V, I_C = -50mA, f = 100MHz
Turn-On Time	t_{on}	-	76	-	ns	V_{CC} = -10V, I_C = -1A
Turn-Off Time	t_{off}	-	149	-	ns	I_{B1} = -I_{B2} = -10mA

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

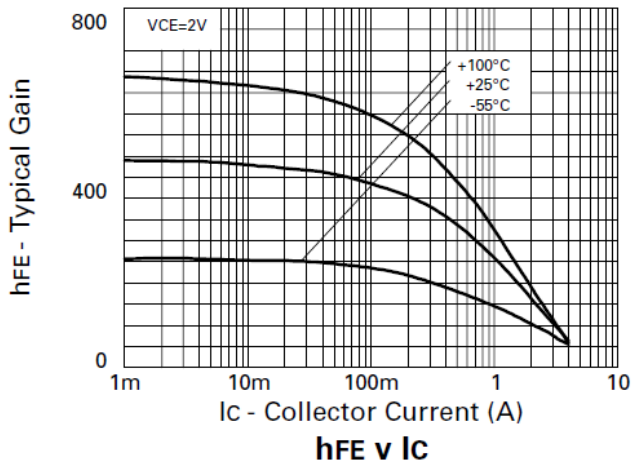
Typical Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)



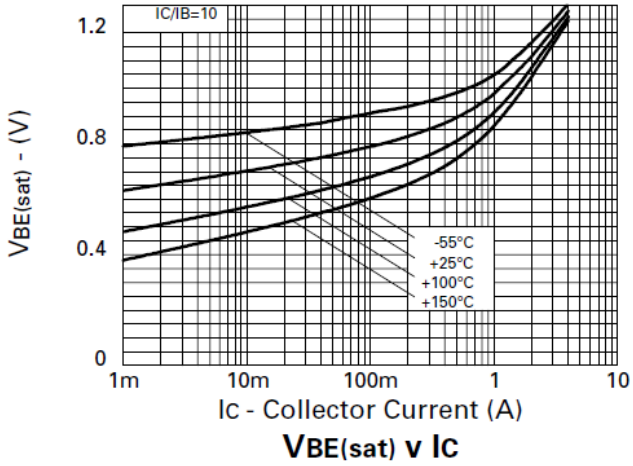
VCE(sat) v IC



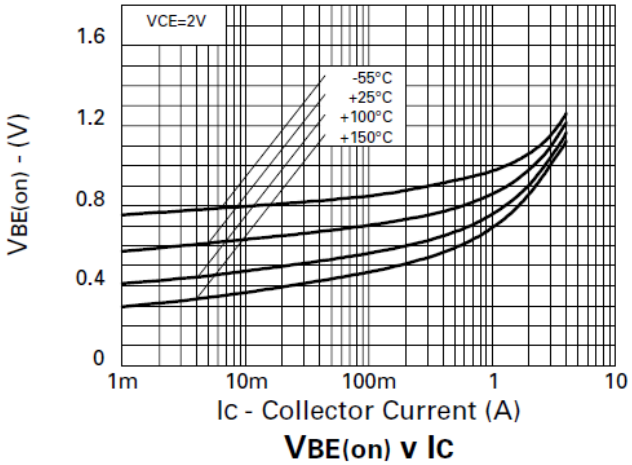
VCE(sat) v IC



hFE v IC



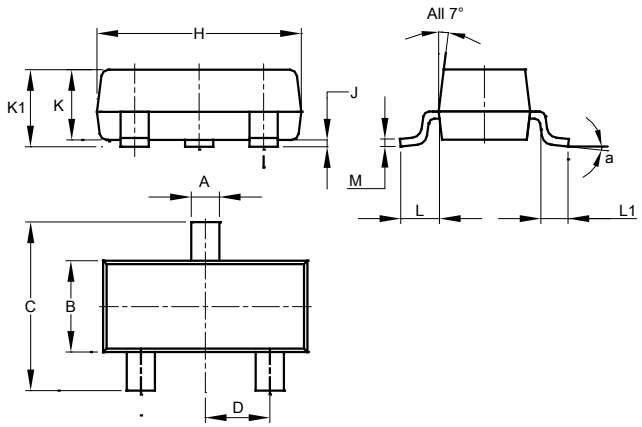
VBE(sat) v IC



VBE(on) v IC

Package Outline Dimensions

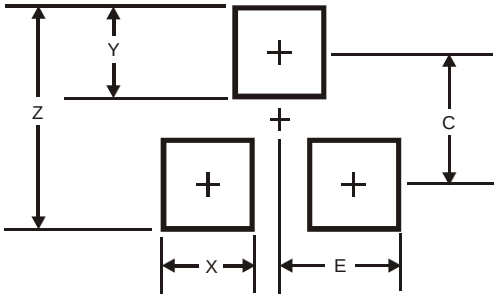
Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for latest version.



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	0.890	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.



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

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