Lead-free Green

FMMT620

80V NPN SILICON LOW SATURATION TRANSISTOR IN SOT23

Features

- BV_{CEO} > 80V
- I_C = 1.5A Continuous Collector Current
- $R_{CE(SAT)}$ = 90mΩ for a low equivalent On-Resistance
- 625mW Power dissipation
- h_{FE} specified up to 5A 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

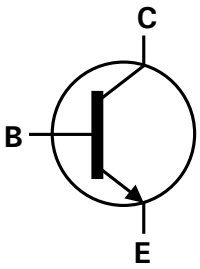
- Case: SOT23
- Case Material: molded plastic, "Green" molding compound
- UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish – Matte Tin Plated Leads, Solderable per MIL-STD-202, Method 208 e3
- Weight 0.008 grams (approximate)

Applications

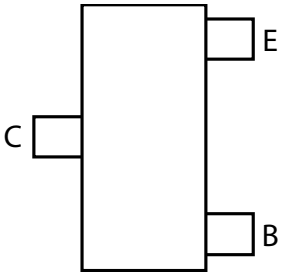
- DC-DC Modules
- Power Management Functions
- Motor control and drive functions
- CCFL Backlighting Inverters

SOT23

Top View



Device Symbol



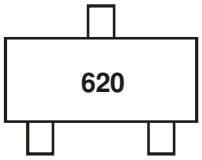
Top View
Pin-Out

Ordering Information (Notes 4 & 5)

Product	Compliance	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
FMMT620TA	AEC-Q101	620	7	8	3,000
FMMT620QTA	Automotive	620	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

Marking Information



620 = Product Type Marking Code

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

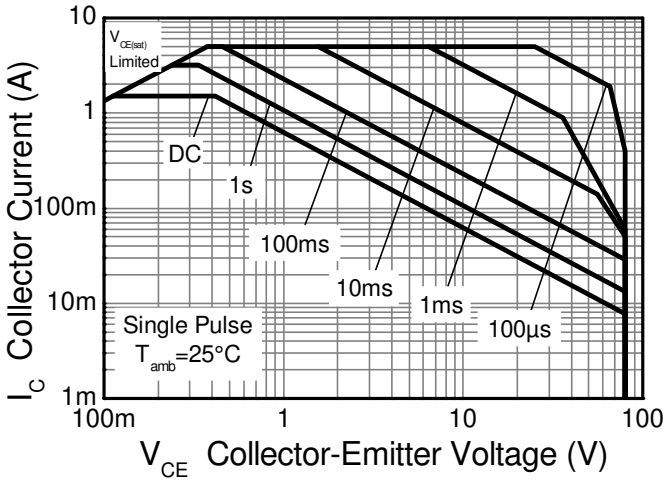
Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	100	V
Collector-Emitter Voltage	V_{CEO}	80	V
Emitter-Base Voltage	V_{EBO}	7	V
Continuous Collector Current	I_C	1.5	A
Peak Pulse Current	I_{CM}	5	A
Base Current	I_B	500	mA

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

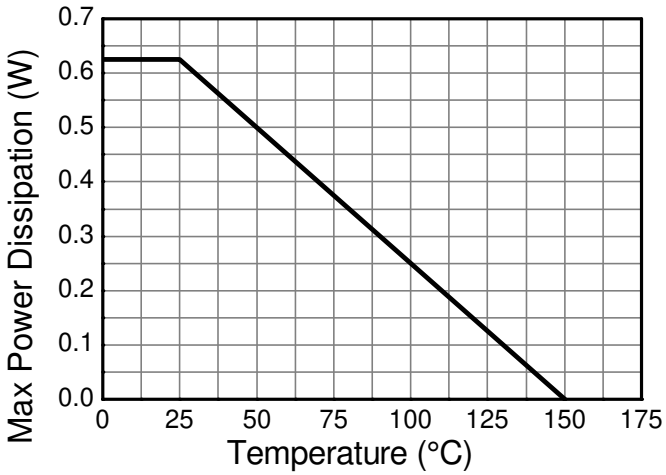
Characteristic	Symbol	Value	Unit
Power Dissipation (Note 6)	P_D	625	mW
Power Dissipation (Note 7)	P_D	806	mW
Thermal Resistance, Junction to Ambient (Note 6)	$R_{\theta JA}$	200	°C/W
Thermal Resistance, Junction to Ambient (Note 7)	$R_{\theta JA}$	155	°C/W
Thermal Resistance, Junction to Leads (Note 8)	$R_{\theta JL}$	194	°C/W
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	°C

Notes:
6. 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.
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).

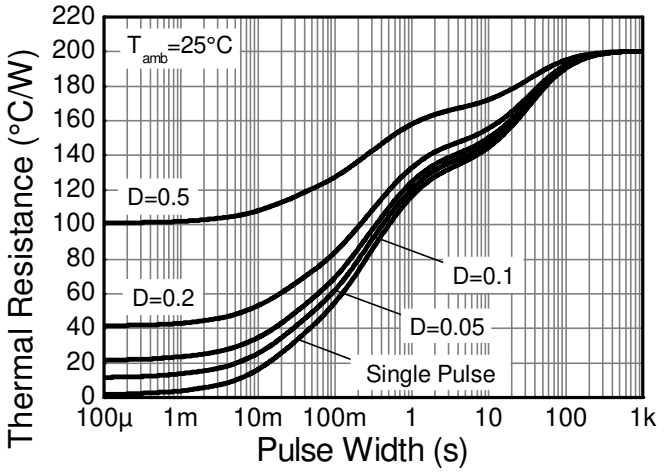
Thermal Characteristics and Derating information



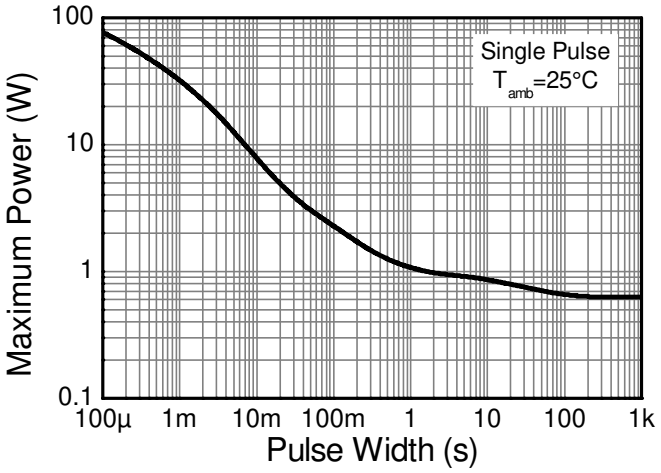
Safe Operating Area



Derating Curve



Transient Thermal Impedance



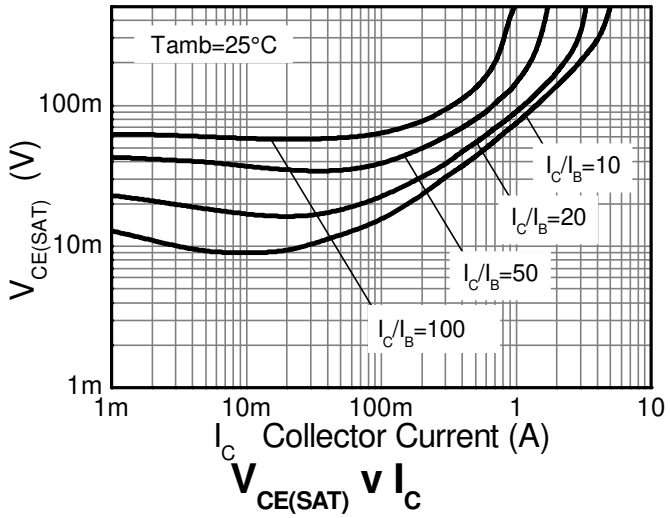
Pulse Power Dissipation

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

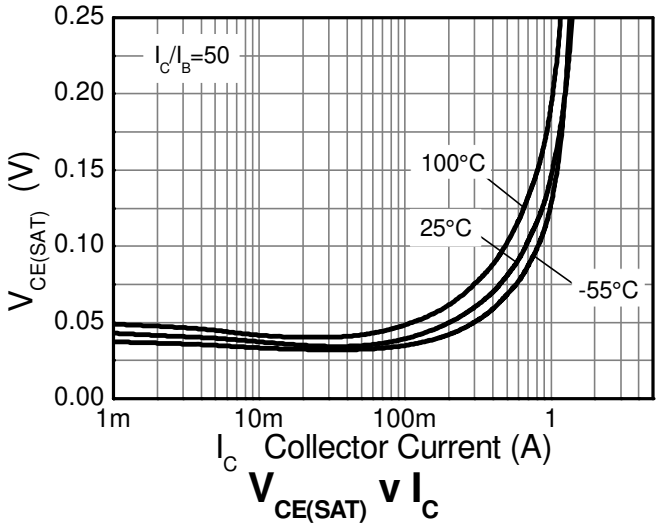
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV_{CBO}	100	180	-	V	I_C = 100µA
Collector-Emitter Breakdown Voltage (Note 9)	BV_{CEO}	80	110	-	V	I_C = 1mA
Emitter-Base Breakdown Voltage	BV_{EBO}	7	8	-	V	I_E = 100µA
Collector Cut-off Current	I_{CBO}	-	-	100	nA	V_{CB} = 80V
Emitter Cut-off Current	I_{EBO}	-	-	100	nA	V_{EB} = 6.0V
Collector Emitter Cut-off Current	I_{CES}	-	-	100	nA	V_{CES} = 80V
Static Forward Current Transfer Ratio (Note 9)	h_{FE}	200 300 110 60 20 -	450 450 170 90 30 10	- 900 - - - -	-	I_C = 10mA, V_{CE} = 2V I_C = 200mA, V_{CE} = 2V I_C = 1A, V_{CE} = 2V I_C = 1.5A, V_{CE} = 2V I_C = 3A, V_{CE} = 2V I_C = 5A, V_{CE} = 2V
Collector-Emitter Saturation Voltage (Note 9)	$V_{CE(sat)}$	- - - -	15 45 145 160	20 60 185 200	mV	I_C = 0.1A, I_B = 10mA I_C = 0.5A, I_B = 50mA I_C = 1A, I_B = 20mA I_C = 1.5A, I_B = 20mA
Base-Emitter Saturation Voltage (Note 9)	$V_{BE(sat)}$	-	0.86	1.0	V	I_C = 1.5A, I_B = 50mA
Base-Emitter Saturation Voltage (Note 9)	$V_{BE(on)}$	-	0.82	0.95	V	I_C = 1.5A, V_{CE} = 2V
Transition Frequency	f_T	100	160	-	MHz	I_C = 50mA, V_{CE} = 10V, f = 100MHz
Collector Output Capacitance	C_{obo}	-	11.5	18	pF	V_{CB} = 10V, f = 1MHz
Turn-On Time	$t_{(on)}$	-	86	-	ns	V_{CC} = 10V, I_C = 500mA, I_{B1} = -I_{B2} = 25mA
Turn-Off Time	$t_{(off)}$	-	1128	-	ns	

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

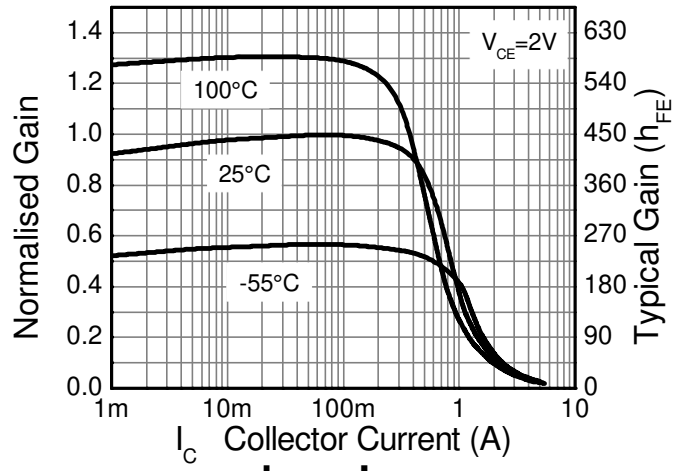
Typical Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)



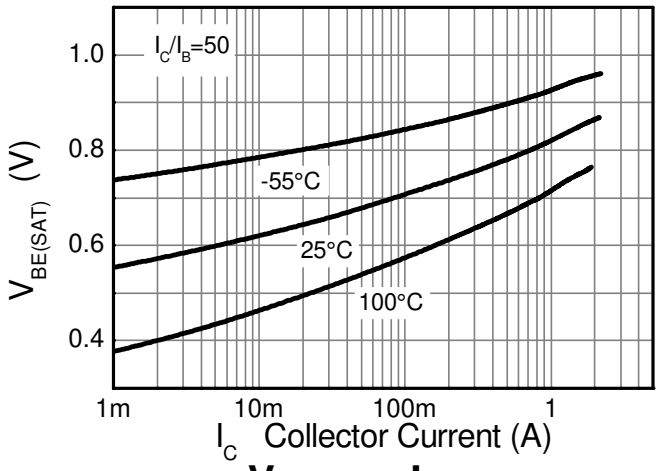
$V_{CE(SAT)}$ v I_C



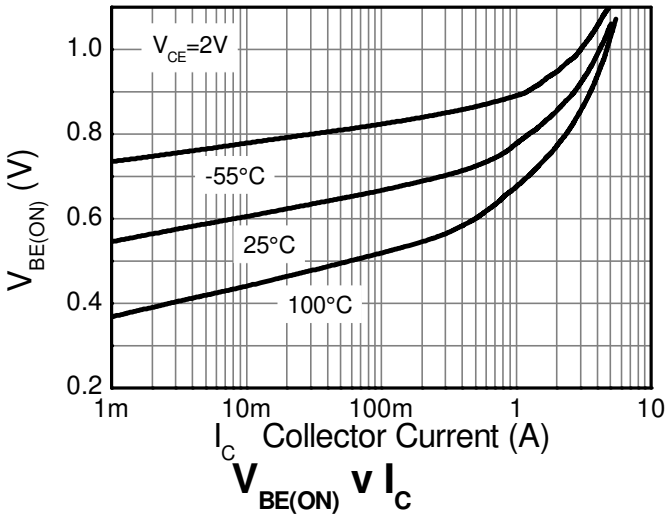
$V_{CE(SAT)}$ v I_C



h_{FE} v I_C



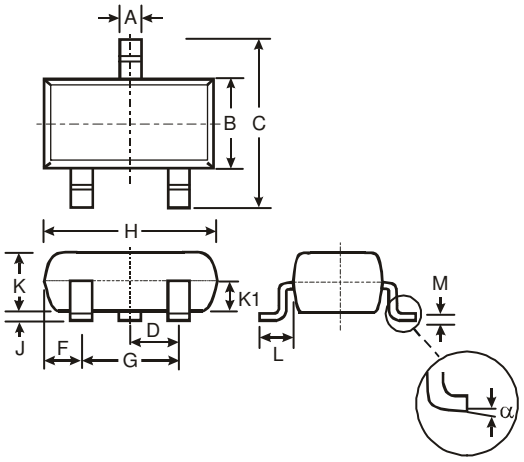
$V_{BE(SAT)}$ v I_C



$V_{BE(ON)}$ v I_C

Package Outline Dimensions

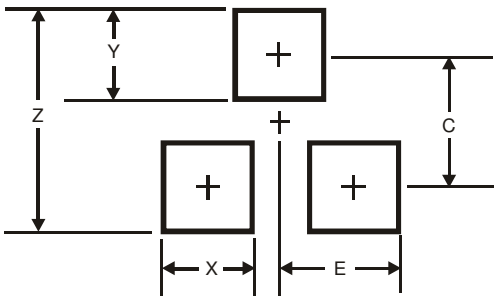
Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for latest version.



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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