

80V NPN SILICON LOW SATURATION TRANSISTOR IN SOT23

Features

- $V_{CE0} = 80V$
- $V_{SAT} = 90m\Omega$
- $I_C = 1.5A$
- Low Equivalent On Resistance
- Low Saturation Voltage
- h_{FE} Characterized up to 3.0A
- **Lead, Halogen, and Antimony Free/RoHS Compliant (Note 1)**
- **"Green" Devices (Note 2)**
- **Qualified to AEC-Q101 Standards for High Reliability**

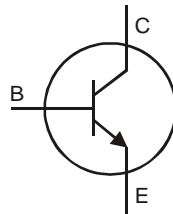
Mechanical Data

- Case: SOT-23
- Case Material: Molded Plastic. "Green" Molding Compound.
- UL Flammability Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Matte Tin Finish
- Weight: 0.008 grams (Approximate)

Applications

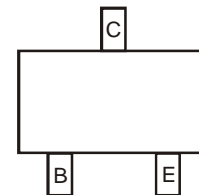
- DC-DC Modules
- Power Management Functions
- CCFL Backlighting Inverters
- Motor control and drive functions

SOT-23



Top View

Device symbol



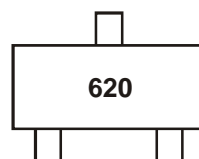
Top View
Pin Configuration

Ordering Information

Product	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
FMMT620TA	620	7	8mm embossed	1000 units
FMMT620TC	620	13	8mm embossed	3000 units

Notes: 1. No purposefully added lead. Halogen and Antimony free: <900ppm bromine, <900ppm chlorine (<1500ppm total) and <1000ppm antimony compounds.
2. Diodes Inc.'s "Green" Policy can be found on our website at <http://www.diodes.com/>

Marking Information



620 = Product Type Marking Code

Maximum Ratings @ $T_A = 25^\circ\text{C}$ unless otherwise specified

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

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Power Dissipation at $T_A = 25^\circ\text{C}$ (Note 3)	P_D	625	mW
Linear Derating Factor		5	mW/ $^\circ\text{C}$
Power Dissipation at $T_A = 25^\circ\text{C}$ (Note 4)	P_D	625	mW
Linear Derating Factor		6.4	mW/ $^\circ\text{C}$
Junction to Ambient (Note 3)	$R_{\theta JA}$	200	$^\circ\text{C}/\text{W}$
Junction to Lead (Note 4)	$R_{\theta JA}$	155	$^\circ\text{C}/\text{W}$
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	$^\circ\text{C}$

Notes: 3. For device surface mounted on 25mm x 25mm FR-4 PCB with high coverage of single sided 1 oz copper, in still air conditions
4. For device mounted on FR-4 PCB measured at $t \leq 5$ Secs.

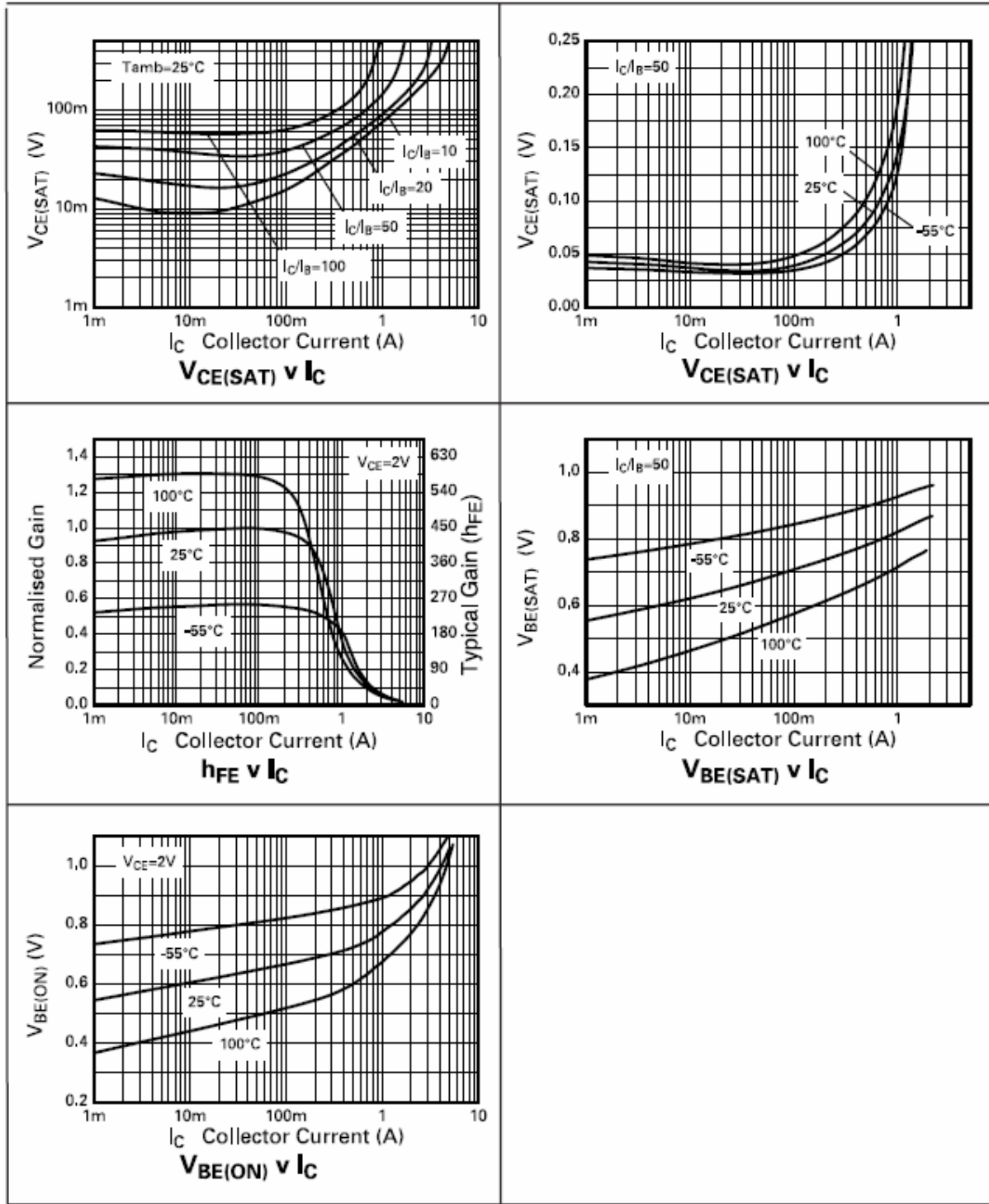
Thermal Characteristics and Derating information

Electrical Characteristics @ $T_A = 25^\circ\text{C}$ unless otherwise specified

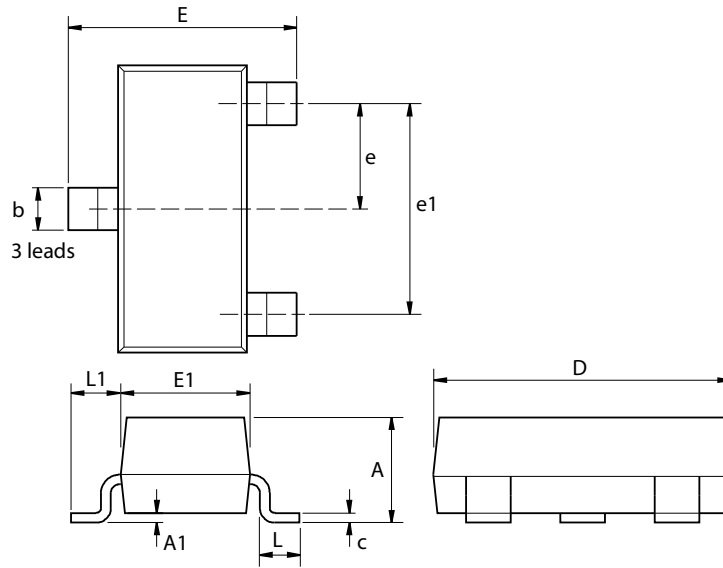
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	100	180	–	V	$I_C = 100\mu\text{A}$
Collector-Emitter Breakdown Voltage (Note 5)	$V_{(BR)CEO}$	80	110	–	V	$I_C = 10\text{mA}$
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	7	8	–	V	$I_E = 100\mu\text{A}$
Collector Cut-off Current	I_{CBO}	–	–	100	nA	$V_{CB} = 80\text{V}$
Emitter Cut-off Current	I_{EBO}	–	–	100	nA	$V_{EB} = 5.5\text{V}$
Collector Emitter Cut-off Current	I_{CES}	–	–	100	nA	$V_{CES} = 80\text{V}$
Static Forward Current Transfer Ratio (Note 5)	h_{FE}	200	450	–	–	$I_C = 10\text{mA}, V_{CE} = 2\text{V}$
		300	450	900		$I_C = 200\text{mA}, V_{CE} = 2\text{V}$
		110	170	–		$I_C = 1\text{A}, V_{CE} = 2\text{V}$
		60	90	–		$I_C = 1.5\text{A}, V_{CE} = 2\text{V}$
		20	30	–		$I_C = 3\text{A}, V_{CE} = 2\text{V}$
		–	10	–		$I_C = 5\text{A}, V_{CE} = 2\text{V}$
Collector-Emitter Saturation Voltage (Note 5)	$V_{CE(sat)}$	–	15	20	mV	$I_C = 0.1\text{A}, I_B = 10\text{mA}$
		–	45	60		$I_C = 0.5\text{A}, I_B = 50\text{mA}$
		–	145	185		$I_C = 1\text{A}, I_B = 20\text{mA}$
		–	160	200		$I_C = 1.5\text{A}, I_B = 50\text{mA}$
Base-Emitter Saturation Voltage (Note 5)	$V_{BE(sat)}$	–	0.86	1.0	V	$I_C = 1.5\text{A}, I_B = 50\text{mA}$
Base-Emitter Saturation Voltage (Note 5)	$V_{BE(on)}$	–	0.82	0.95	V	$I_C = 1.5\text{A}, V_{CE} = 2\text{V}$
Transition Frequency	f_T	100	160	–	MHz	$I_C = 50\text{mA}, V_{CE} = 10\text{V}$ $f = 100\text{MHz}$
Collector Output Capacitance	C_{obo}	–	11.5	18	pF	$V_{CB} = 10\text{V}, f = 1\text{MHz}$
Turn-On Time	$t_{(on)}$	–	86	–	ns	$V_{CC} = 10\text{V}, I_C = 500\text{mA}$
Turn-Off Time	$t_{(off)}$	–	1128	–	ns	$I_{B1} = I_{B2} = 25\text{mA}$

Notes: 5. Measured under pulsed conditions. Pulse width $\leq 300\mu\text{s}$. Duty cycle $\leq 2\%$

Typical Characteristics



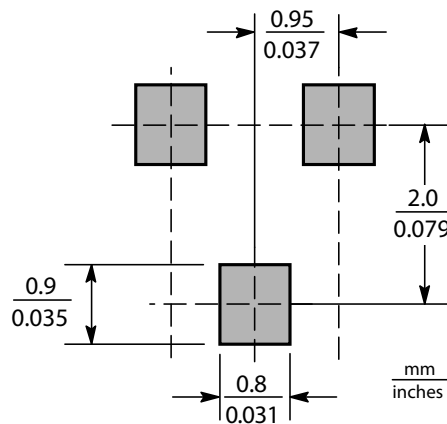
Package Outline Dimensions



Dim.	Millimeters		Inches		Dim.	Millimeters		Inches	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	-	1.12	-	0.044	e1	1.90 NOM		0.075 NOM	
A1	0.01	0.10	0.0004	0.004	E	2.10	2.64	0.083	0.104
b	0.30	0.50	0.012	0.020	E1	1.20	1.40	0.047	0.055
c	0.085	0.20	0.003	0.008	L	0.25	0.60	0.0098	0.0236
D	2.80	3.04	0.110	0.120	L1	0.45	0.62	0.018	0.024
e	0.95 NOM		0.037 NOM		-	-	-	-	-

Note: Controlling dimensions are in millimeters. Approximate dimensions are provided in inches

Suggested Pad Layout



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