

**20V PNP SILICON LOW SATURATION TRANSISTOR IN SOT23**

**Features and Benefits**

- $BV_{CEO} > -20V$
- $I_C = -1A$  Continuous Collector Current
- $I_{CM} = -2A$  Peak Pulse Current
- Low Saturation Voltage  $V_{CE(sat)} < -320mV @ -1A$
- $h_{FE}$  characterised up to  $-1.5A$  for high current gain hold-up
- 500mW power dissipation
- Complementary part number FMMTL618
- **Lead Free, RoHS Compliant (Note 1)**
- **Halogen and Antimony Free "Green" Device (Note 2)**
- **Qualified to AEC-Q101 Standards for High Reliability**

**Mechanical Data**

- Case: SOT-23
- UL Flammability Rating 94V-0
- Case material: molded Plastic.
- Moisture Sensitivity: Level 1 per J-STD-020D
- Terminals: Matte Tin Finish annealed over Copper plated Alloy 42 leadframe. Solderable per MIL-STD-202, Method 208
- Weight: 0.008 grams (Approximate)

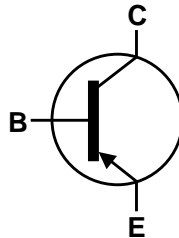
**Applications**

- MOSFET Gate Driving
- DC-DC Converters
- Charging circuit
- Power switches

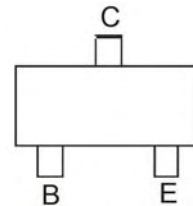
SOT23



Top View



Device Symbol



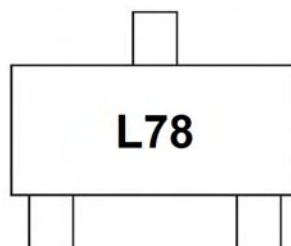
Top View  
Pin-Out

**Ordering Information** (Note 3)

Product	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
FMMTL718TA	L78	7	8	3,000

- Notes:
1. No purposefully added lead.
  2. Diodes Inc.'s "Green" Policy can be found on our website at <http://www.diodes.com>
  3. For Packaging Details, go to our website at <http://www.diodes.com>.

**Marking Information**



L78 = Product Type Marking Code

**Maximum Ratings** @T<sub>A</sub> = 25°C unless otherwise specified

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V <sub>CBO</sub>	-20	V
Collector-Emitter Voltage	V <sub>CEO</sub>	-20	V
Emitter-Base Voltage	V <sub>EBO</sub>	-5	V
Continuous Collector Current	I <sub>C</sub>	-1	A
Peak Pulse Current	I <sub>CM</sub>	-2	A
Base Current	I <sub>B</sub>	-200	mA

**Thermal Characteristics** @T<sub>A</sub> = 25°C unless otherwise specified

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 4)	P <sub>D</sub>	500	mW
Thermal Resistance, Junction to Ambient (Note 4)	R <sub>θJA</sub>	250	°C/W
Thermal Resistance, Junction to Lead (Note 5)	R <sub>θJL</sub>	197	°C/W
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 to +150	°C

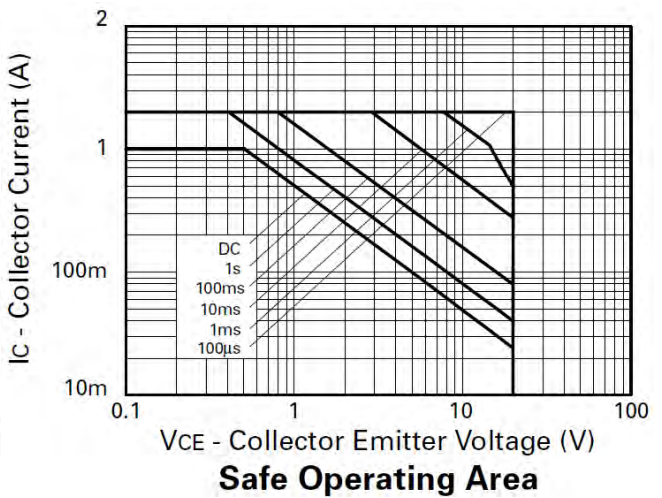
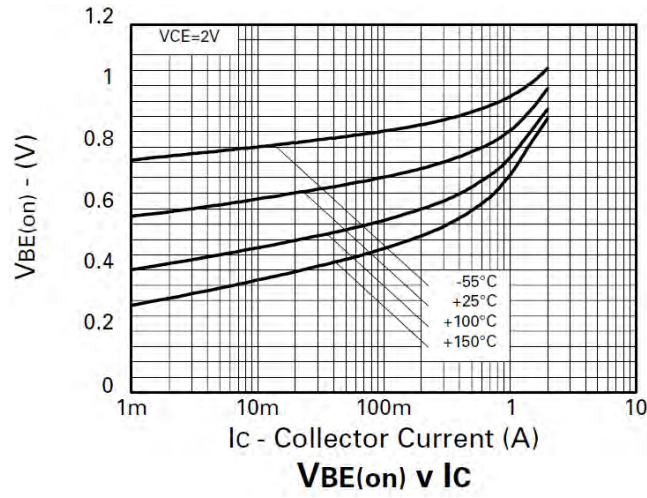
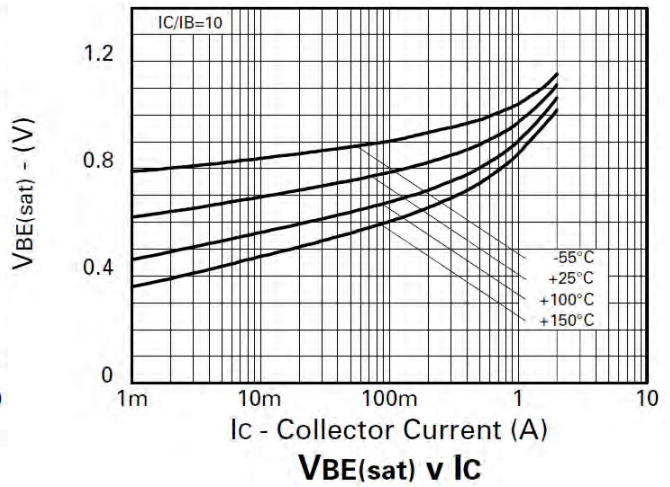
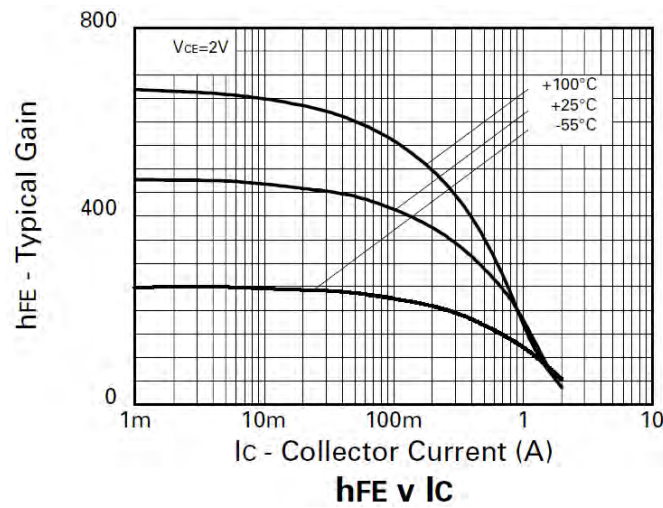
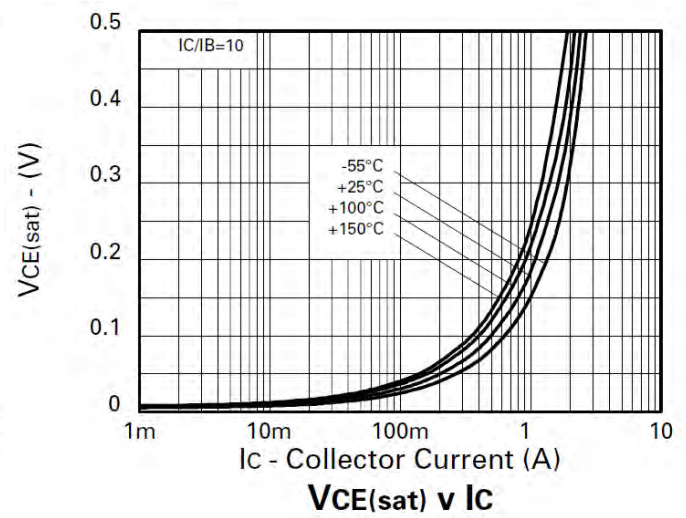
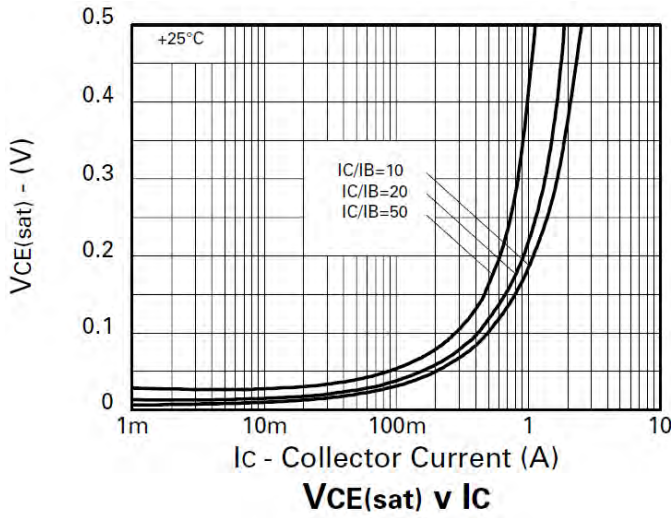
- Notes:
4. For a device surface mounted on 15mm X 15mm FR4 PCB with high coverage of single sided 1 oz copper, in still air conditions; the device is measured when operating in a steady-state condition.
  5. Thermal resistance from junction to solder-point (at the end of the collector lead).

**Electrical Characteristics** @T<sub>A</sub> = 25°C unless otherwise specified

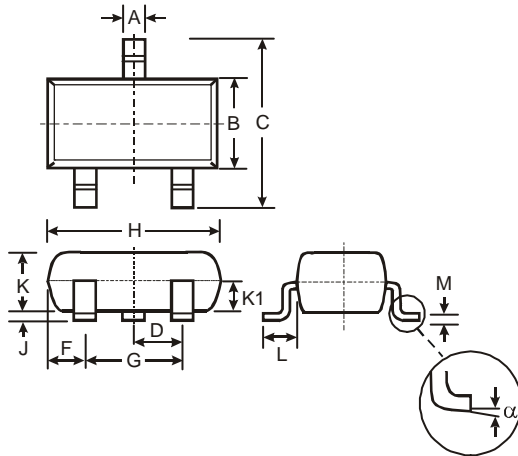
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV <sub>CBO</sub>	-20	-65		V	I <sub>C</sub> = -100 μA
Collector-Emitter Breakdown Voltage (Note 6)	BV <sub>CEO</sub>	-20	-55		V	I <sub>C</sub> = -10 mA
Emitter-Base Breakdown Voltage	BV <sub>EBO</sub>	-5	-8.8		V	I <sub>E</sub> = -100 μA
Collector Cutoff Current	I <sub>CBO</sub>			-10	nA	V <sub>CB</sub> = -15V
Emitter Cutoff Current	I <sub>EBO</sub>			-10	nA	V <sub>EB</sub> = -4V
Collector Emitter Cutoff Current	I <sub>CES</sub>			-10	nA	V <sub>CE</sub> = -15V
Static Forward Current Transfer Ratio (Note 6)	h <sub>FE</sub>	300 300 200 120 50	500 450 320 200 80			I <sub>C</sub> = -10mA, V <sub>CE</sub> = -2V I <sub>C</sub> = -100mA, V <sub>CE</sub> = -2V I <sub>C</sub> = -0.5A, V <sub>CE</sub> = -2V I <sub>C</sub> = -1A, V <sub>CE</sub> = -2V I <sub>C</sub> = -1.5A, V <sub>CE</sub> = -2V
Collector-Emitter Saturation Voltage (Note 6)	V <sub>CE(sat)</sub>		-33 -130 -230 -315	-50 -180 -320 -450	mV mV mV mV	I <sub>C</sub> = -100mA, I <sub>B</sub> = -10mA I <sub>C</sub> = -500mA, I <sub>B</sub> = -20mA I <sub>C</sub> = -1A, I <sub>B</sub> = -50mA I <sub>C</sub> = -1.5A, I <sub>B</sub> = -100mA
Base-Emitter Turn-On Voltage (Note 6)	V <sub>BE(on)</sub>		-0.85	-1.0	V	I <sub>C</sub> = -1.25A, V <sub>CE</sub> = -2V
Base-Emitter Saturation Voltage (Note 6)	V <sub>BE(sat)</sub>		-0.95	-1.1	V	I <sub>C</sub> = -1.25A, I <sub>B</sub> = -100mA
Equivalent On-Resistance	R <sub>CE(sat)</sub>		210		mΩ	I <sub>C</sub> = -1.5A
Output Capacitance	C <sub>obo</sub>		9	12	pF	V <sub>CB</sub> = -10V, f = 1MHz
Transition Frequency	f <sub>T</sub>		265		MHz	V <sub>CE</sub> = -10V, I <sub>C</sub> = -50mA, f = 100MHz
Turn-On Time	t <sub>on</sub>		108		ns	V <sub>CC</sub> = -10V, I <sub>C</sub> = -1A
Turn-Off Time	t <sub>off</sub>		121		ns	I <sub>B1</sub> = I <sub>B2</sub> = -10mA

- Note: 6. Measured under pulsed conditions. Pulse width ≤ 300 μs. Duty cycle ≤ 2%

**Typical Electrical Characteristics**

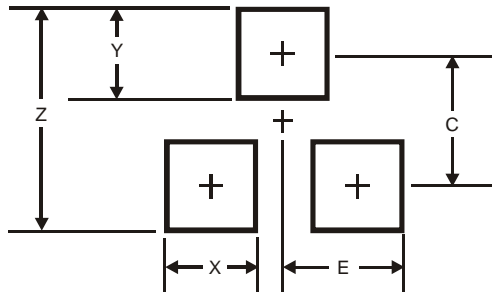


**Package Outline Dimensions**



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**



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

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