

20V PNP SILICON LOW SATURATION TRANSISTOR IN SOT23

Features and Benefits

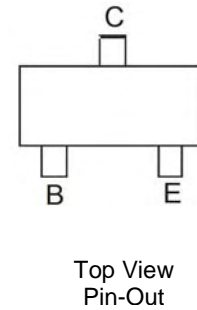
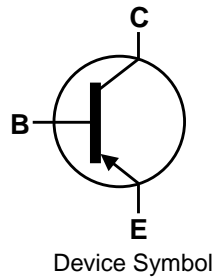
- $BV_{CEO} > -20V$
- $I_C = -1A$ Continuous Collector Current
- $I_{CM} = -2A$ Peak Pulse Current
- Low Saturation Voltage $V_{CE(sat)} < -320mV @ -1A$
- h_{FE} characterised up to $-1.5A$ for high current gain hold-up
- 500mW power dissipation
- Complementary part number FMMTL618
- **Lead Free, RoHS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

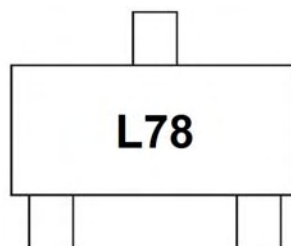


Ordering Information (Note 3)

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_A = 25°C unless otherwise specified

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V _{CBO}	-20	V
Collector-Emitter Voltage	V _{CEO}	-20	V
Emitter-Base Voltage	V _{EBO}	-5	V
Continuous Collector Current	I _C	-1	A
Peak Pulse Current	I _{CM}	-2	A
Base Current	I _B	-200	mA

Thermal Characteristics @T_A = 25°C unless otherwise specified

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

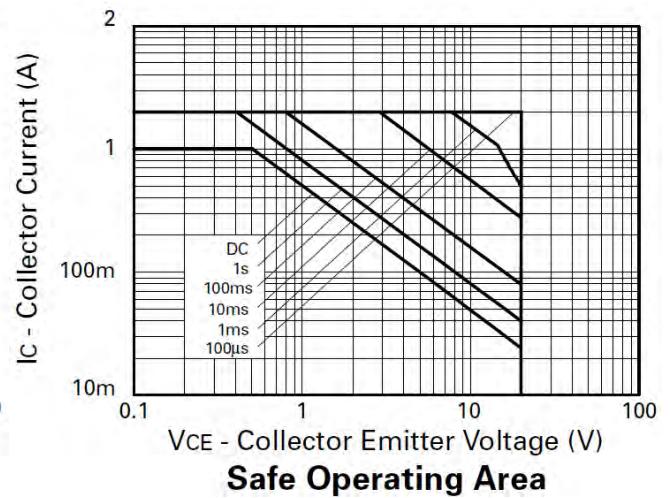
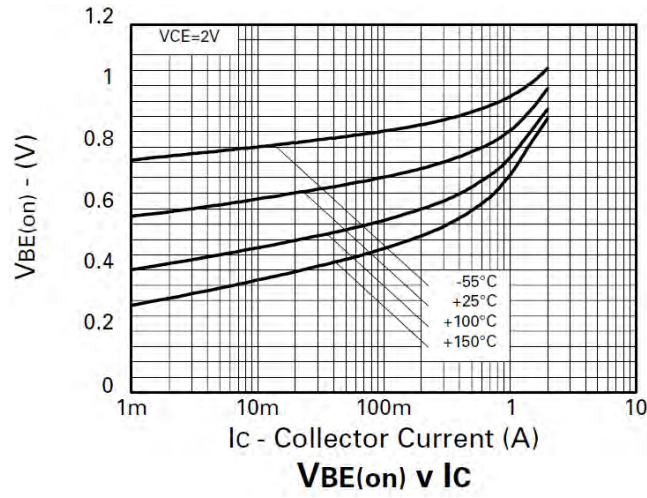
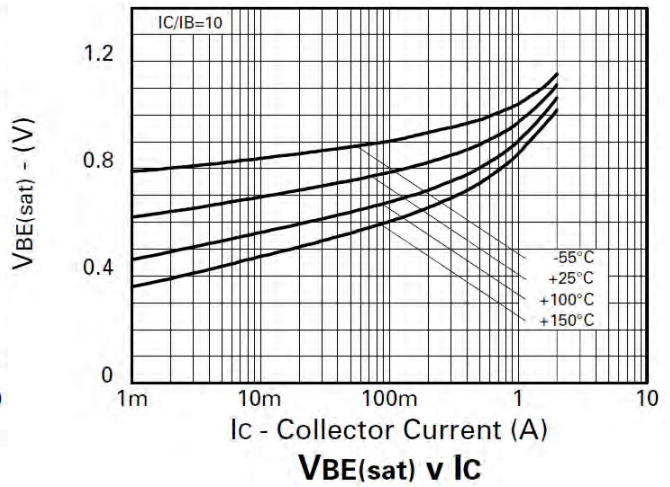
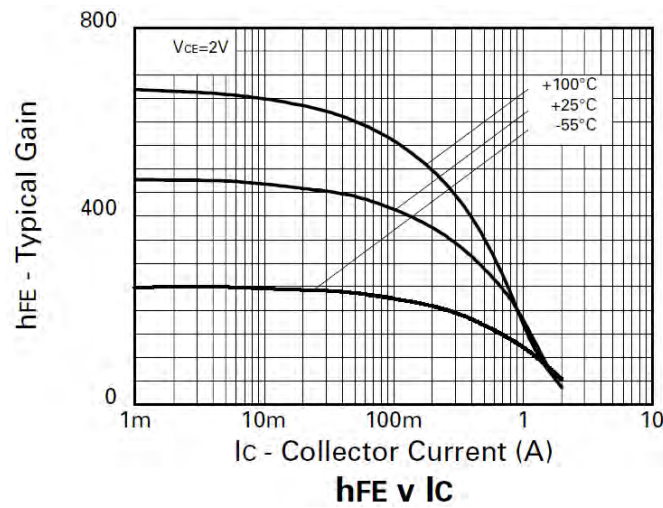
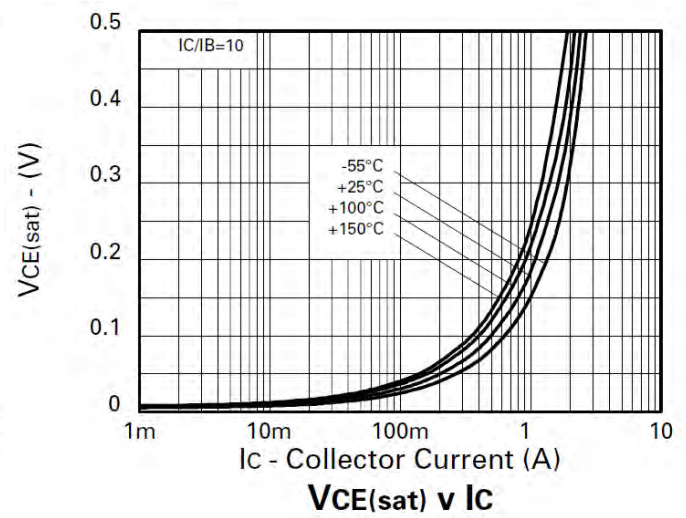
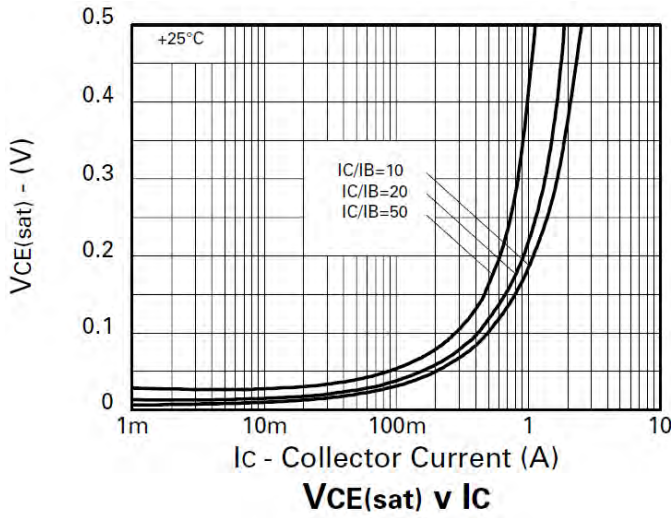
- Notes:
4. For a device surface mounted on 15mm X 15mm FR4 PCB with high coverage of single sided 1 oz copper, in still air conditions; the device is measured when operating in a steady-state condition.
 5. Thermal resistance from junction to solder-point (at the end of the collector lead).

Electrical Characteristics @T_A = 25°C unless otherwise specified

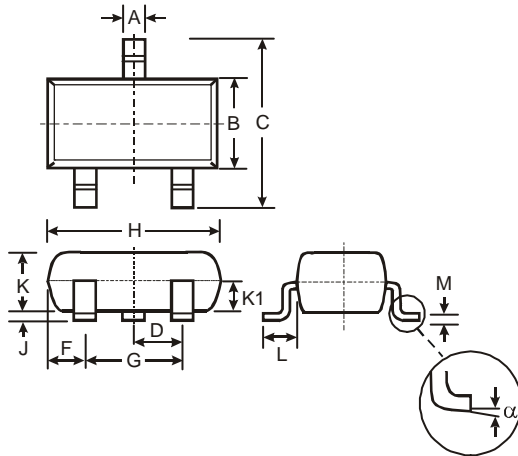
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV _{CBO}	-20	-65		V	I _C = -100 μA
Collector-Emitter Breakdown Voltage (Note 6)	BV _{CEO}	-20	-55		V	I _C = -10 mA
Emitter-Base Breakdown Voltage	BV _{EBO}	-5	-8.8		V	I _E = -100 μA
Collector Cutoff Current	I _{CBO}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

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

Typical Electrical Characteristics

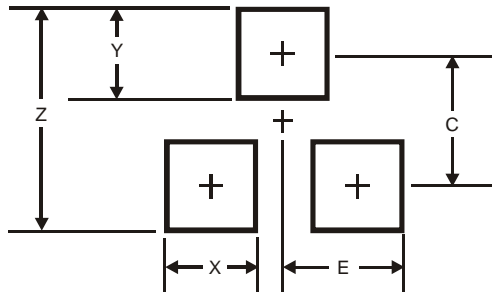


Package Outline Dimensions



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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