

FMMT618TA Datasheet



<https://www.DiGi-Electronics.com>

DiGi Electronics Part Number	FMMT618TA-DG
Manufacturer	Diodes Incorporated
Manufacturer Product Number	FMMT618TA
Description	TRANS NPN 20V 2.5A SOT23-3
Detailed Description	Bipolar (BJT) Transistor NPN 20 V 2.5 A 140MHz 625 mW Surface Mount SOT-23-3



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Purchase and inquiry

Manufacturer Product Number:

FMMT618TA

Series:

-

Transistor Type:

NPN

Voltage - Collector Emitter Breakdown (Max):

20 V

Current - Collector Cutoff (Max):

100nA

Power - Max:

625 mW

Operating Temperature:

-55°C ~ 150°C (TJ)

Package / Case:

TO-236-3, SC-59, SOT-23-3

Base Product Number:

FMMT618

Manufacturer:

Diodes Incorporated

Product Status:

Active

Current - Collector (Ic) (Max):

2.5 A

Vce Saturation (Max) @ Ib, Ic:

200mV @ 50mA, 2.5A

DC Current Gain (hFE) (Min) @ Ic, Vce:

200 @ 2A, 2V

Frequency - Transition:

140MHz

Mounting Type:

Surface Mount

Supplier Device Package:

SOT-23-3

Environmental & Export classification

RoHS Status:

ROHS3 Compliant

REACH Status:

REACH Unaffected

HTSUS:

8541.21.0075

Moisture Sensitivity Level (MSL):

1 (Unlimited)

ECCN:

EAR99



FMMT618

20V NPN SILICON LOW SATURATION TRANSISTOR IN SOT23

Features

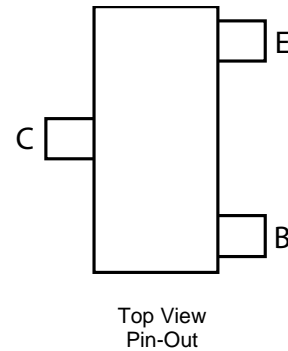
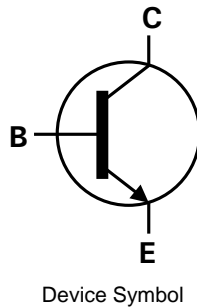
- $BV_{CEO} > 20V$
- $I_C = 2.5A$ Continuous Collector Current
- $R_{CE(SAT)} = 50m\Omega$ for a low equivalent On-Resistance
- 625mW Power dissipation
- h_{FE} characterised up to 6A for high current gain hold up
- Complementary NPN type: FMMT718
- **Totally Lead-Free & Fully RoHS compliant (Notes 1 & 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
- Gate driver
- LED driver

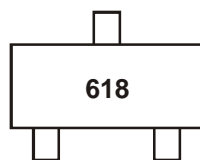


Ordering Information (Note 5)

Product	Compliance	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
FMMT618TA	AEC-Q101	618	7	8	3,000
FMMT618QTA	Automotive	618	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



618 = Product Type Marking Code

Maximum Ratings (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

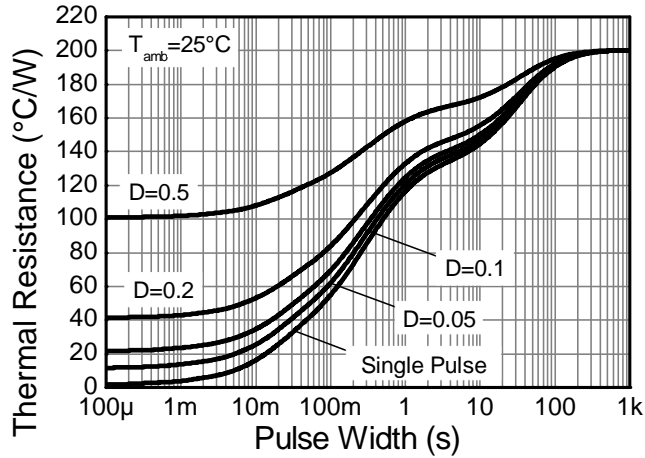
Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	20	V
Collector-Emitter Voltage	V_{CEO}	20	V
Emitter-Base Voltage	V_{EBO}	7	V
Continuous Collector Current	I_C	2.5	A
Peak Pulse Current	I_{CM}	6	A
Base Current	I_B	500	mA

Thermal Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

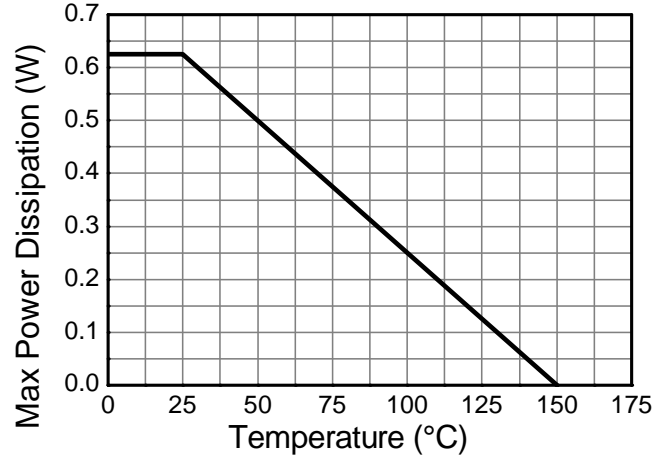
Characteristic	Symbol	Value	Unit
Power Dissipation (Note 6)	P_D	625	mW
Power Dissipation (Note 7)	P_D	806	mW
Thermal Resistance, Junction to Ambient (Note 6)	$R_{\theta JA}$	200	$^\circ\text{C}/\text{W}$
Thermal Resistance, Junction to Ambient (Note 7)	$R_{\theta JA}$	155	$^\circ\text{C}/\text{W}$
Thermal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

- 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 $t \leq 5$ sec.
 8. Thermal resistance from junction to solder-point (at the end of the collector lead).

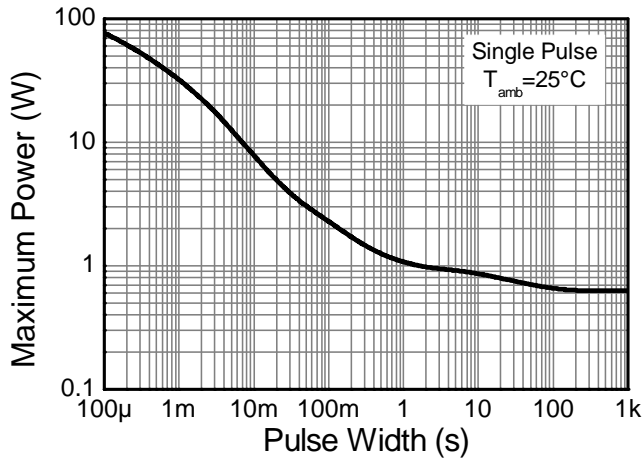
Thermal Characteristics and Derating information



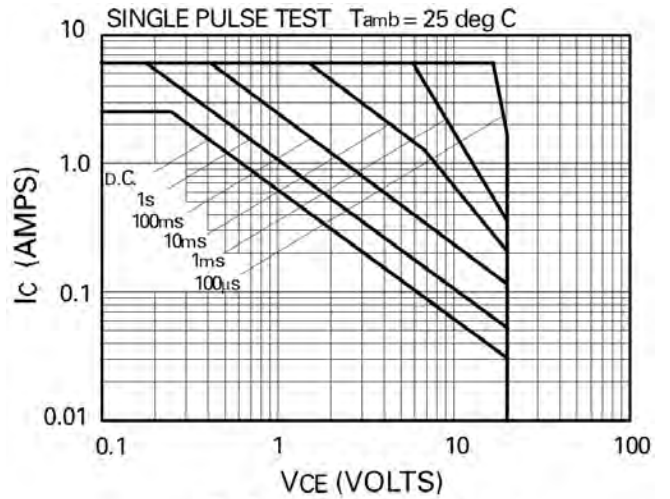
Transient Thermal Impedance



Derating Curve



Pulse Power Dissipation



Safe Operating Area



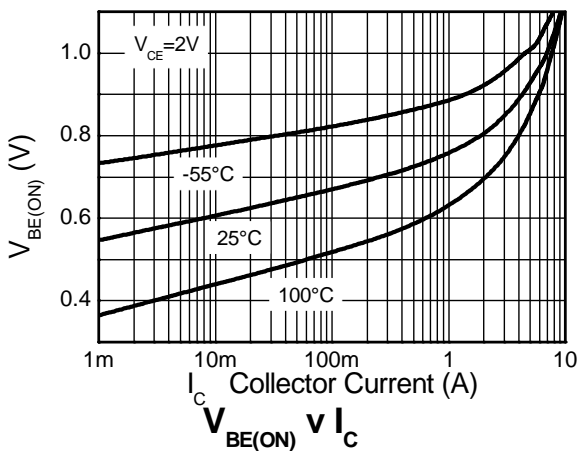
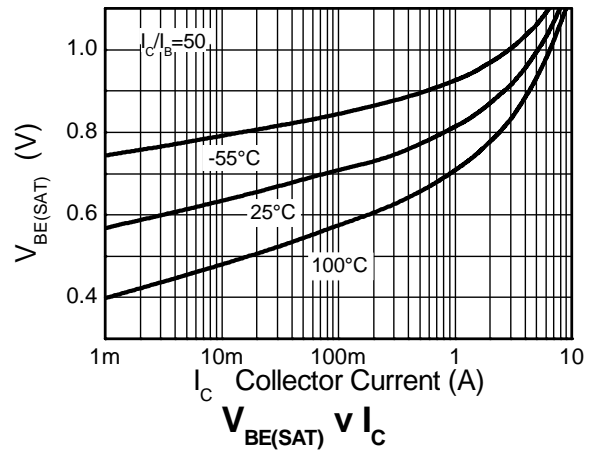
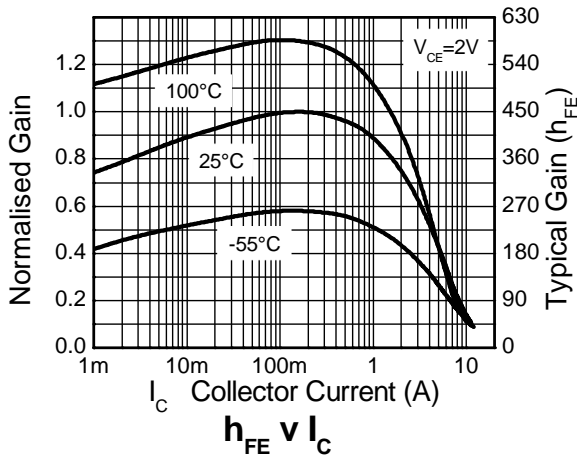
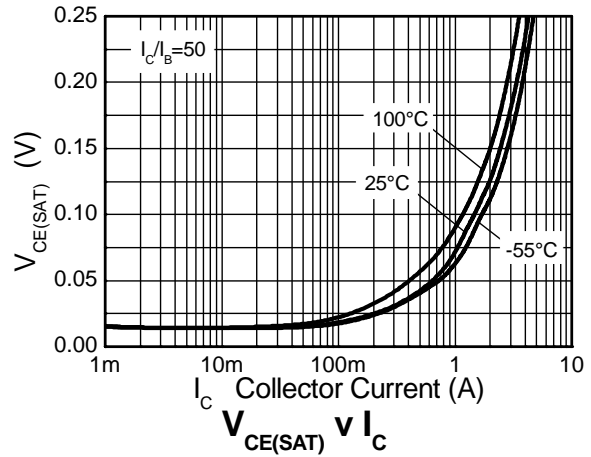
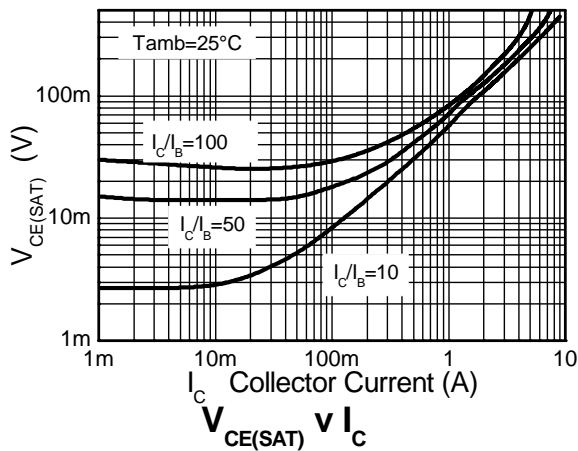
FMMT618

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV _{CBO}	20	100	-	V	I _C = 100μA
Collector-Emitter Breakdown Voltage (Note 9)	BV _{CEO}	20	27	-	V	I _C = 10mA
Emitter-Base Breakdown Voltage	BV _{EBO}	7	8.3	-	V	I _E = 100μA
Collector Cut-off Current	I _{CBO}	-	-	100	nA	V _{CB} = 20V
Emitter Cut-off Current	I _{EBO}	-	-	100	nA	V _{EB} = 4V
Collector Emitter Cut-off Current	I _{CES}	-	-	100	nA	V _{CES} = 20V
Static Forward Current Transfer Ratio (Note 9)	h _{FE}	200 300 200 100	400 450 340 150	- - - -	-	I _C = 10mA, V _{CE} = 2V I _C = 200mA, V _{CE} = 2V I _C = 2A, V _{CE} = 2V I _C = 6A, V _{CE} = 2V
Collector-Emitter Saturation Voltage (Note 9)	V _{CE(sat)}	-	8 70 130	15 150 200	mV	I _C = 0.1A, I _B = 10mA I _C = 1A, I _B = 10mA I _C = 2.5A, I _B = 50mA
Base-Emitter Saturation Voltage (Note 9)	V _{BE(sat)}	-	0.89	1.0	V	I _C = 2.5A, I _B = 50mA
Base-Emitter Saturation Voltage (Note 9)	V _{BE(on)}	-	0.83	1.0	V	I _C = 2.5A, V _{CE} = 2V
Transition Frequency	f _T	100	140	-	MHz	I _C = 50mA, V _{CE} = 10V, f = 100MHz
Collector Output Capacitance	C _{obo}	-	23	30	pF	V _{CB} = 10V, f = 1MHz
Turn-On Time	t _(on)	-	170	-	ns	V _{CC} = 10V, I _C = 1A,
Turn-Off Time	t _(off)	-	400	-	ns	I _{B1} = -I _{B2} = 10mA

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

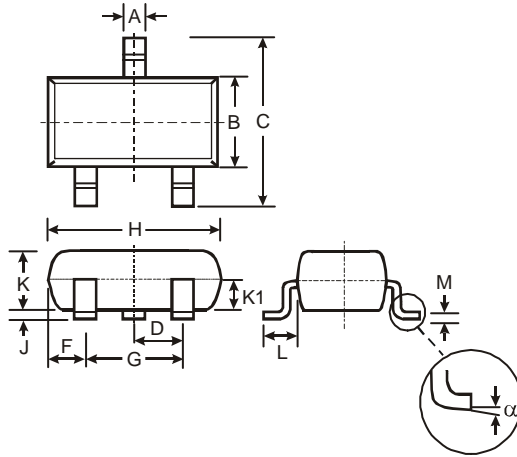
Typical Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)



FMMT618

Package Outline Dimensions

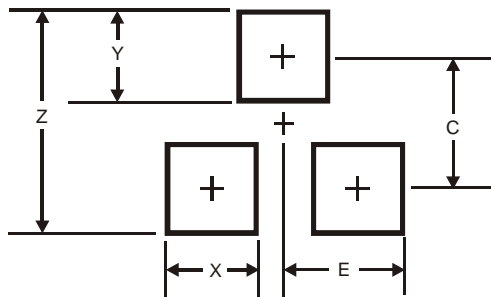
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for latest version.



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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