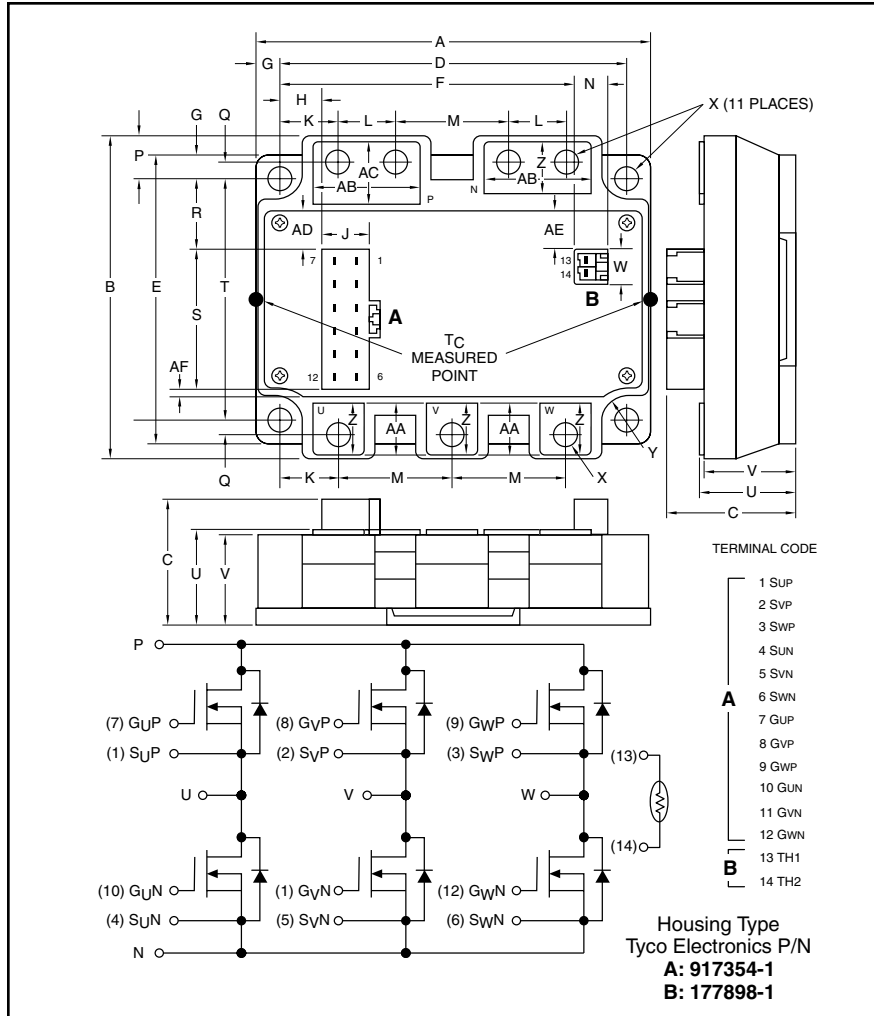


6-Pack High Power MOSFET Module 300 Amperes/100 Volts



Outline Drawing and Circuit Diagram

Dimensions	Inches	Millimeters
A	4.33	110.0
B	3.54	90.0
C	1.38	35.0
D	3.82	97.0
E	3.15	80.0
F	3.27	83.0
G	0.26	6.5
H	0.48	12.0
J	0.51	12.9
K	0.65	16.5
L	0.63	16.0
M	1.26	32.0
N	0.35	8.8
P	0.45	11.5
Q	0.16	4.0

Dimensions	Inches	Millimeters
R	0.79	20.0
S	1.50	38.0
T	2.64	67.0
U	1.02	26.0
V	0.98	25.0
W	0.36	9.1
X	Dia. 0.25	Dia. 6.5
Y	Rad. 0.25	Rad. 6.5
Z	0.57	14.5
AA	0.55	14.0
AB	1.18	30.0
AC	0.69	17.5
AD	0.47	12.0
AE	0.61	15.5
AF	0.18	4.5



Description:

Powerex MOSFET Modules are designed for use in low voltage switching applications. Each module consists of 6 MOSFET switches with low $R_{DS(on)}$ and a fast recovery body diode to yield low loss. All components and interconnects are isolated from the heat sink baseplate. This offers simplified system assembly and thermal management.

Features:

- ☐ Low $ESW(off)$ and Low $R_{DS(on)}$
- ☐ Super-Fast Recovery Free-Wheel Diode
- ☐ Thermistor for T_C Sensing
- ☐ Parallel Legs to make a Dual Module at 3X the Rating
- ☐ Positive Locking Connectors
- ☐ Easy Bus Bar Layout Due to Flow Through Power Design

Applications:

- ☐ Forklift
- ☐ Off road Electric Vehicle
- ☐ Welder
- ☐ UPS
- ☐ Chopper

Ordering Information:

Example: Select the complete part module number you desire from the table below -i.e. FM600TU-2A is a 100V (V_{DSS}), 300 Ampere 6-Pack High Power MOSFET Module.

Type	Current Rating Amperes	V_{DSS} Volts
FM	300	100

FM600TU-2A

6-Pack High Power MOSFET Module

300 Amperes/100 Volts

Absolute Maximum Ratings, $T_j = 25^\circ\text{C}$ unless otherwise specified

Ratings	Symbol	FM600TU-2A	Units
Channel Temperature	T_j	-40 to 150	$^\circ\text{C}$
Storage Temperature	T_{stg}	-40 to 125	$^\circ\text{C}$
Drain-Source Voltage (G-S Short)	V_{DS}	100	Volts
Gate-Source Voltage (D-E Short)	V_{GS}	± 20	Volts
Drain Current ($T_C = 133^\circ\text{C}$)	$I_{D(rms)}$	300	A_{rms}
Peak Drain Current (Pulse)	I_{DM}	600*	Amperes
Avalanche Current ($L = 10\mu\text{H}$, Pulse)	I_{DA}	300*	Amperes
Source Current ($T_C = 25^\circ\text{C}$)**	$I_{S(rms)}$	300	A_{rms}
Peak Source Current (Pulse)**	I_{SM}	600*	Amperes
Maximum Power Dissipation ($T_C = 25^\circ\text{C}$, $T_j < 150^\circ\text{C}$ ***)	P_D	960	Watts
Maximum Peak Power Dissipation ($T_C = 25^\circ\text{C}$, $T_j < 150^\circ\text{C}$ ***)	P_D	1300	Watts
Mounting Torque, M6 Main Terminal	—	40	in-lb
Mounting Torque, M6 Mounting	—	40	in-lb
Weight	—	600	Grams
Isolation Voltage (Main Terminal to Baseplate, AC 1 min.)	V_{ISO}	2500	Volts

Electrical Characteristics, $T_{ch} = 25^\circ\text{C}$ unless otherwise specified

Characteristics	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Drain-Cutoff Current	I_{DSS}	$V_{DS} = V_{DSS}$, $V_{GS} = 0\text{V}$	—	—	1.0	mA
Gate-Source Threshold Voltage	$V_{GS(th)}$	$I_D = 30\text{mA}$, $V_{DS} = 10\text{V}$	4.7	6.0	7.3	Volts
Gate Leakage Current	I_{GSS}	$V_{GS} = V_{GSS}$, $V_{DS} = 0\text{V}$	—	—	1.5	μA
Static Drain-Source On-State Resistance (Chip)	$r_{DS(on)}$	$I_D = 300\text{A}$, $V_{GS} = 15\text{V}$, $T_j = 25^\circ\text{C}$	—	0.8	1.1	$\text{m}\Omega$
		$I_D = 300\text{A}$, $V_{GS} = 15\text{V}$, $T_j = 125^\circ\text{C}$	—	1.37	—	$\text{m}\Omega$
Static Drain-Source On-State Voltage (Chip)	$V_{DS(on)}$	$I_D = 300\text{A}$, $V_{GS} = 15\text{V}$, $T_j = 25^\circ\text{C}$	—	0.24	0.33	Volts
		$I_D = 300\text{A}$, $V_{GS} = 15\text{V}$, $T_j = 125^\circ\text{C}$	—	0.41	—	Volts
Lead Resistance	R_{lead}	$I_D = 300\text{A}$, Terminal-Chip, $T_j = 25^\circ\text{C}$	—	0.7	—	$\text{m}\Omega$
		$I_D = 300\text{A}$, Terminal-Chip, $T_j = 125^\circ\text{C}$	—	1.0	—	$\text{m}\Omega$
Input Capacitance	C_{iss}	$V_{DS} = 10\text{V}$, $V_{GS} = 0\text{V}$	—	—	110	nF
Output Capacitance	C_{oss}		—	—	15	nF
Reverse Transfer Capacitance	C_{rss}		—	—	10	nF
Total Gate Charge	Q_G	$V_{DD} = 48\text{V}$, $I_D = 300\text{A}$, $V_{GS} = 15\text{V}$	—	1800	—	nC
Inductive	Turn-on Delay Time	$V_{DD} = 48\text{V}$, $I_D = 300\text{A}$, $V_{GS1} = V_{GS2} = 15\text{V}$, $R_G = 4.2\Omega$, Inductive Load Switching Operation,	—	—	400	ns
Load	Rise Time		—	—	600	ns
Switching	Turn-off Delay Time		—	—	600	ns
Time	Fall Time		—	—	400	ns
Diode Reverse Recovery Time**	t_{rr}	$I_S = 300\text{A}$	—	—	250	ns
Diode Reverse Recovery Charge**	Q_{rr}		—	6.2	—	μC
Source-Drain Voltage	V_{SD}	$I_S = 300\text{A}$, $V_{GS} = 0\text{V}$	—	—	1.3	Volts

* Pulse width and repetition rate should be such that device channel temperature (T_j) does not exceed $T_{j(max)}$ rating.

**Represents characteristics of the anti-parallel, source-to-drain free-wheel diode (FWDi).

*** T_C measured point is just under the chips. If you use this value, $R_{th(f-a)}$ should be measured just under the chips.

FM600TU-2A
6-Pack High Power MOSFET Module
 300 Amperes/100 Volts

Thermal and Mechanical Characteristics, $T_j = 25^\circ\text{C}$ unless otherwise specified

Characteristics	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Thermal Resistance, Channel to Case	$R_{th(j-c)}$	MOSFET part (1/6 Module) T_C Reference Point per Outline Drawing	—	—	0.13	$^\circ\text{C/W}$
Thermal Resistance, Channel to Case	$R_{th(j-c')}$	MOSFET part (1/6 Module) Measured Point is Just Under the Chips.	—	—	0.096	$^\circ\text{C/W}$
Contact Thermal Resistance	$R_{th(c-f)}$	Per 1/6 Module, Thermal Grease Applied	—	0.1	—	$^\circ\text{C/W}$

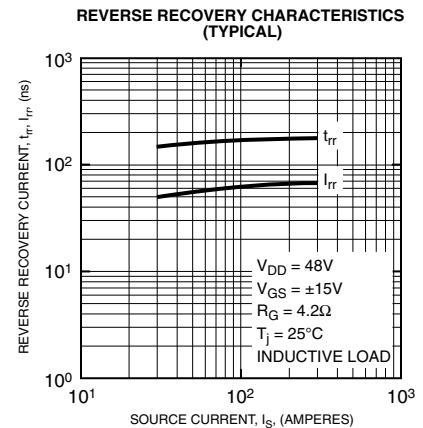
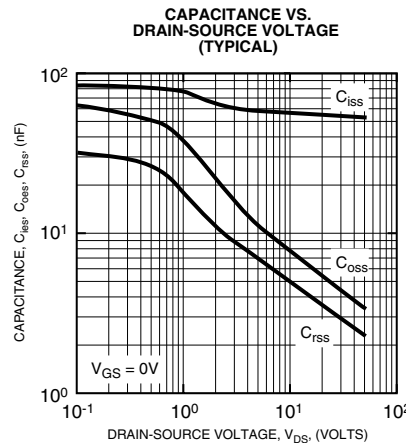
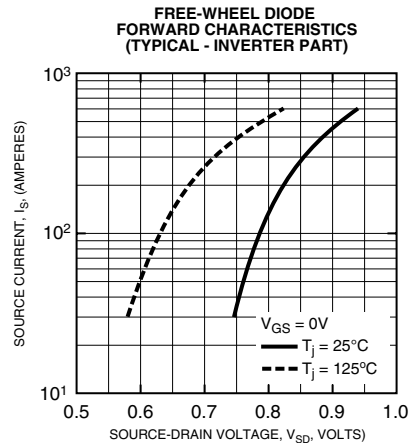
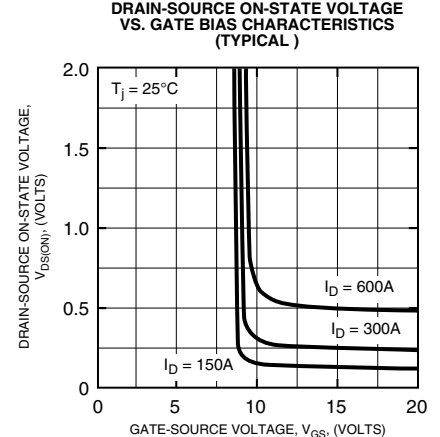
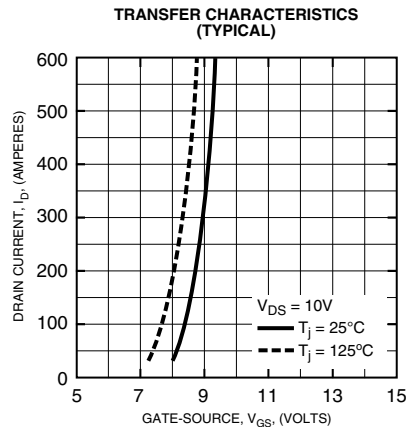
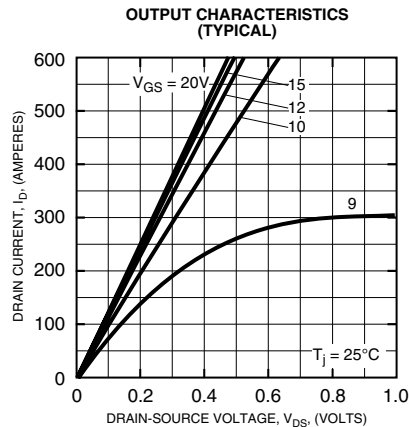
Thermistors Part

Characteristics	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Resistance*	R_{th}	$T_C = 25^\circ\text{C}$	—	100	—	$k\Omega$
B Constant*	B	Resistance at 25°C , 50°C	—	4000	—	K

* $B = (\ln R_1 - \ln R_2) / (1/T_1 - 1/T_2)$

R_1 : Resistance at $T_1(K)$,

R_2 : Resistance at $T_2(K)$



FM600TU-2A

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