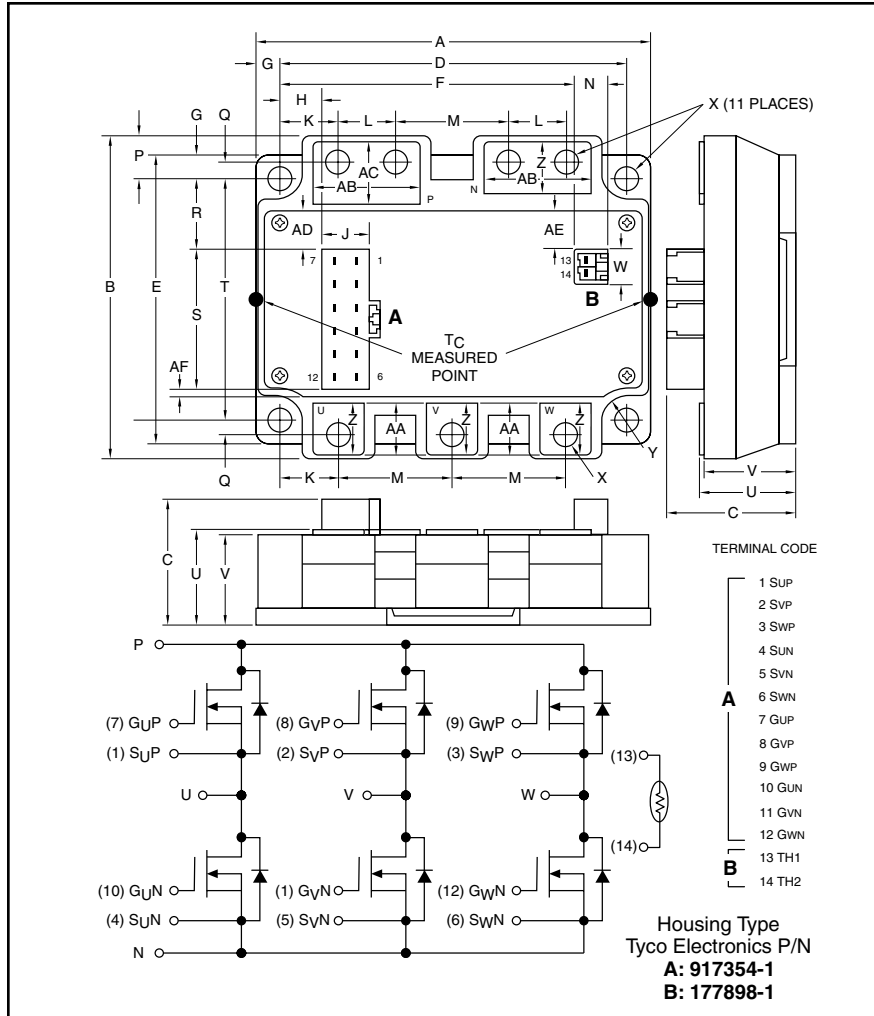


6-Pack High Power MOSFET Module 100 Amperes/75 Volts



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 $E_{SW(off)}$ 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. FM200TU-07A is a 75V (V_{DSS}), 100 Ampere 6-Pack High Power MOSFET Module.

Type	Current Rating Amperes	V_{DSS} Volts
FM	100	75

FM200TU-07A

6-Pack High Power MOSFET Module

100 Amperes/75 Volts

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

Ratings	Symbol	FM200TU-07A	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}	75	Volts
Gate-Source Voltage (D-E Short)	V_{GS}	± 20	Volts
Drain Current ($T_C = 25^\circ\text{C}$)	$I_D(\text{rms})$	100	A_{rms}
Peak Drain Current (Pulse)	I_{DM}	200*	Amperes
Avalanche Current ($L = 10\mu\text{H}$, Pulse)	I_{DA}	100*	Amperes
Source Current ($T_C = 25^\circ\text{C}$)**	$I_S(\text{rms})$	100	A_{rms}
Peak Source Current (Pulse)**	I_{SM}	200*	Amperes
Maximum Power Dissipation ($T_C = 25^\circ\text{C}$, $T_j < 150^\circ\text{C}$)***	P_D	410	Watts
Maximum Peak Power Dissipation ($T_C = 25^\circ\text{C}$, $T_j < 150^\circ\text{C}$)***	P_D	560	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, $T_j = 25^\circ\text{C}$ 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	$V_{GS(th)}$	$I_D = 10\text{mA}$, $V_{DS} = 10\text{V}$	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)	$r_{DS(on)}$	$I_D = 100\text{A}$, $V_{GS} = 15\text{V}$, $T_j = 25^\circ\text{C}$	—	1.2	1.65	$\text{m}\Omega$
		$I_D = 100\text{A}$, $V_{GS} = 15\text{V}$, $T_j = 125^\circ\text{C}$	—	1.92	—	$\text{m}\Omega$
Static Drain-Source On-State Voltage (Chip)	$V_{DS(on)}$	$I_D = 100\text{A}$, $V_{GS} = 15\text{V}$, $T_j = 25^\circ\text{C}$	—	0.12	0.165	Volts
		$I_D = 100\text{A}$, $V_{GS} = 15\text{V}$, $T_j = 125^\circ\text{C}$	—	0.192	—	Volts
Lead Resistance	R_{lead}	$I_D = 100\text{A}$, Terminal-Chip, $T_j = 25^\circ\text{C}$	—	1.2	—	$\text{m}\Omega$
		$I_D = 100\text{A}$, Terminal-Chip, $T_j = 125^\circ\text{C}$	—	1.68	—	$\text{m}\Omega$
Input Capacitance	C_{iss}	$V_{DS} = 10\text{V}$, $V_{GS} = 0\text{V}$	—	—	50	nF
Output Capacitance	C_{oss}		—	—	7	nF
Reverse Transfer Capacitance	C_{rss}		—	—	4	nF
Total Gate Charge	Q_G	$V_{DD} = 48\text{V}$, $I_D = 100\text{A}$, $V_{GS} = 15\text{V}$	—	700	—	nC
Inductive	Turn-on Delay Time	$V_{DD} = 48\text{V}$, $I_D = 100\text{A}$, $V_{GS1} = V_{GS2} = 15\text{V}$, $R_G = 13\Omega$, Inductive Load Switching Operation,	—	—	450	ns
Load	Rise Time		—	—	400	ns
Switch	Turn-off Delay Time		—	—	600	ns
Time	Fall Time		—	—	400	ns
Diode Reverse Recovery Time**	t_{rr}	$I_S = 100\text{A}$	—	—	200	ns
Diode Reverse Recovery Charge**	Q_{rr}		—	2.0	—	μC
Source-Drain Voltage	V_{SD}	$I_S = 100\text{A}$, $V_{GS} = 0\text{V}$	—	—	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.

FM200TU-07A

6-Pack High Power MOSFET Module

100 Amperes/75 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	—	—	0.30	$^\circ\text{C/W}$
Thermal Resistance, Channel to Case	$R_{th(j-c')}$	MOSFET part (1/6 Module) Measured Point is Just Under the Chips.	—	—	0.22	$^\circ\text{C/W}$
Contact Thermal Resistance	$R_{th(c-f)}$	Per 1/6 Module, Thermal Grease Applied	—	0.1	—	$^\circ\text{C/W}$

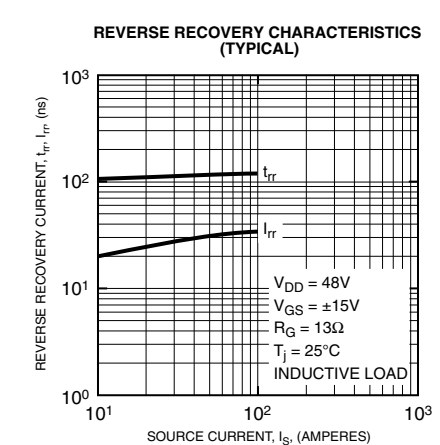
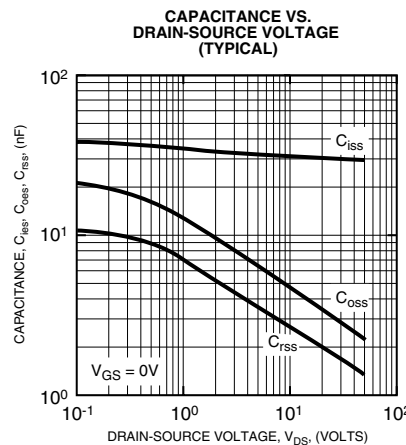
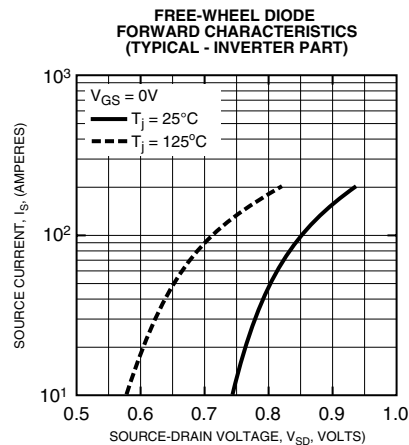
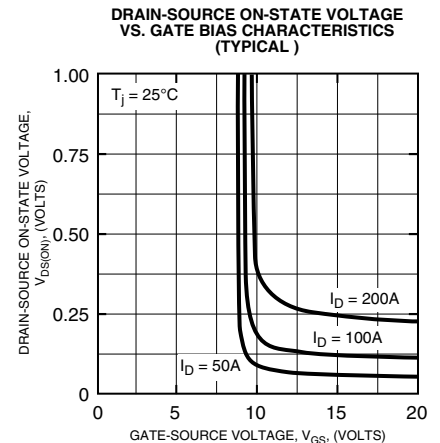
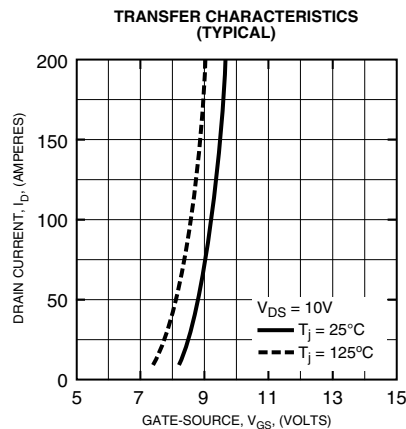
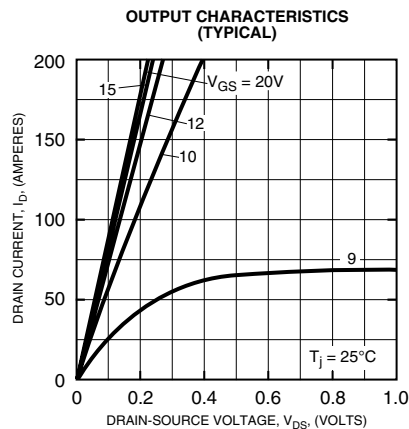
Thermistors Part

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 $T_2(K)$

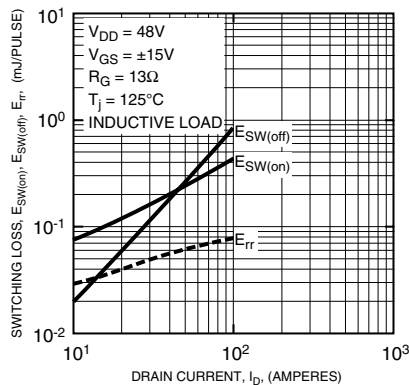


FM200TU-07A

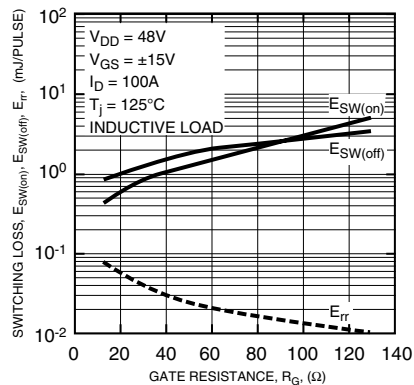
6-Pack High Power MOSFET Module

100 Amperes/75 Volts

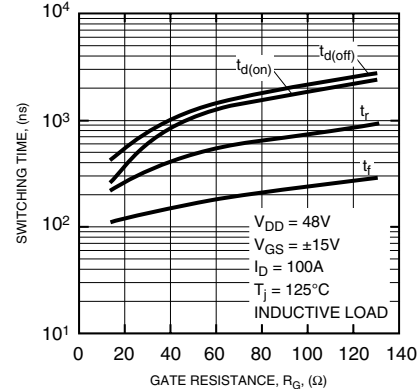
SWITCHING LOSS VS. DRAIN CURRENT
(TYPICAL)



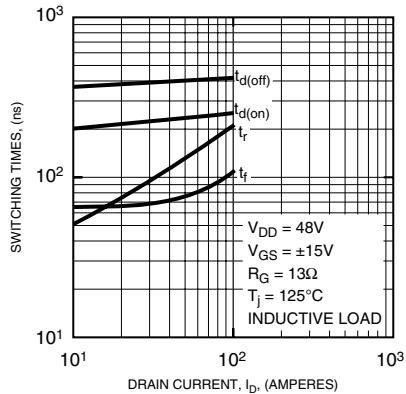
SWITCHING LOSS VS. GATE RESISTANCE
(TYPICAL)



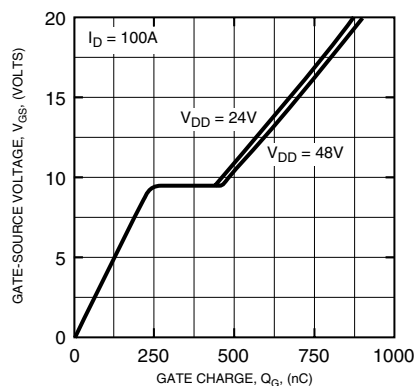
SWITCHING TIME VS. GATE RESISTANCE
(TYPICAL)



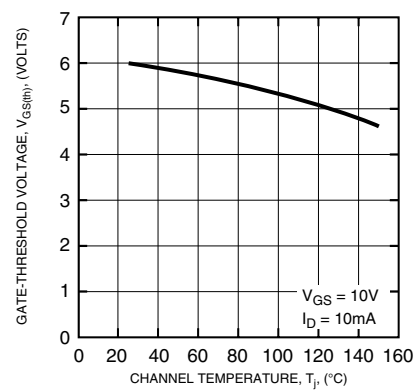
SWITCHING TIME VS. DRAIN CURRENT
(TYPICAL)



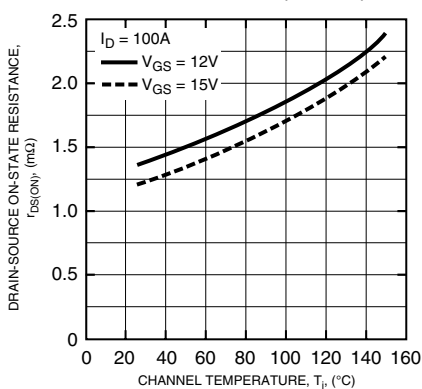
GATE CHARGE CHARACTERISTICS
(TYPICAL)



GATE THRESHOLD VOLTAGE
VS. TEMPERATURE (TYPICAL)



DRAIN-SOURCE ON-STATE RESISTANCE
VS. TEMPERATURE (TYPICAL)



TRANSIENT THERMAL
IMPEDANCE CHARACTERISTICS
(TYPICAL)

