

FM200TU-2AHIGH POWER SWITCHING USE
INSULATED PACKAGE**FM200TU-2A**

- $I_D(\text{rms})$ 100A
- V_{DSS} 100V
- Insulated Type
- 6-elements in a pack
- Thermistor inside
- UL Recognized

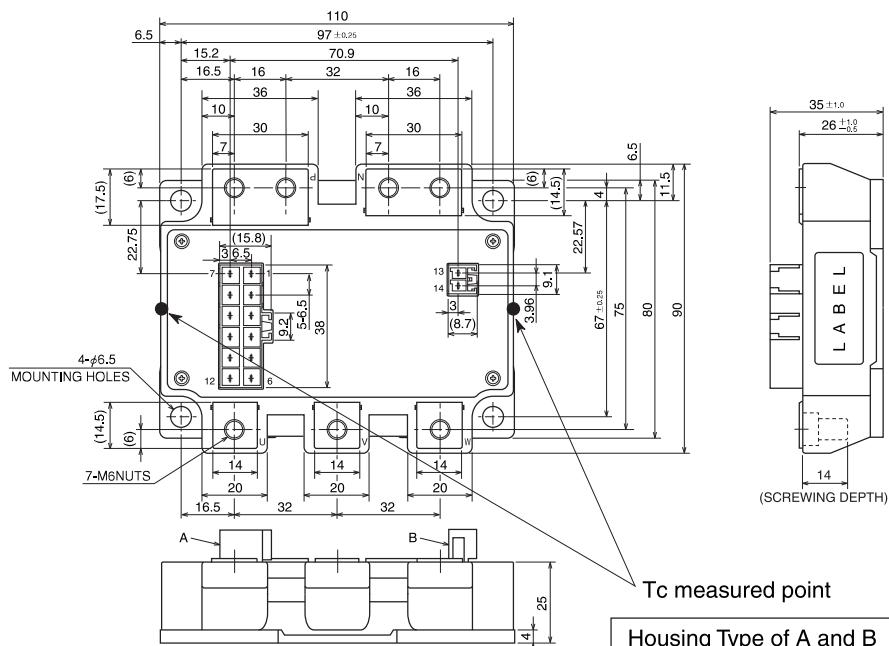
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APPLICATION

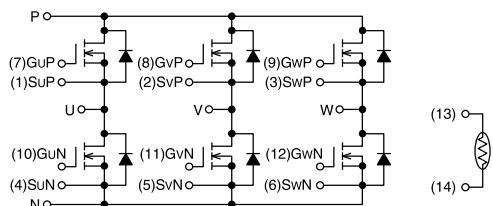
AC motor control of forklift (battery power source), UPS

OUTLINE DRAWING & CIRCUIT DIAGRAM

Dimensions in mm



Housing Type of A and B
(Tyco Electronics P/N:)
A: 917353-1
B: 179838-1

CIRCUIT DIAGRAM

	A
(1)SuP	
(7)GuP	
(10)GuN	
(13)TH1	
(2)SvP	
(8)GvP	
(11)GvN	
(14)TH2	
(3)SwP	
(9)GwP	
(12)GwN	
(4)SuN	
(5)SvN	
(6)SwN	
	B

ABSOLUTE MAXIMUM RATINGS ($T_j = 25^\circ\text{C}$ unless otherwise specified.)

Symbol	Item	Conditions	Rating	Unit
V_{dss}	Drain-source voltage	G-S Short	100	V
V_{gss}	Gate-source voltage	D-S Short	± 20	V
I_d	Drain current	$T_c' = 137^\circ\text{C}^{*3}$	100	A
I_{dm}		Pulse ^{*2}	200	A
I_{da}	Avalanche current	$L = 10\mu\text{H}$ Pulse ^{*2}	100	A
I_s^{*1}	Source current		100	A
I_{sm}^{*1}		Pulse ^{*2}	200	A
P_d^{*4}	Maximum power dissipation	$T_c = 25^\circ\text{C}$	410	W
P_d^{*4}		$T_c' = 25^\circ\text{C}^{*3}$	560	W
T_{ch}	Channel temperature		$-40 \sim +150$	$^\circ\text{C}$
T_{stg}	Storage temperature		$-40 \sim +125$	$^\circ\text{C}$
V_{isol}	Isolation voltage	Main terminal to base plate, AC 1 min, f=60Hz, RMS	2500	V
—	Mounting torque	Main Terminal M6	3.5 ~ 4.5	N·m
—		Mounting to heat sink M6	3.5 ~ 4.5	N·m
—	Weight	Typical value	600	g

ELECTRICAL CHARACTERISTICS ($T_j = 25^\circ\text{C}$ unless otherwise specified.)

Symbol	Item	Conditions	Limits			Unit
			Min.	Typ.	Max.	
I_{dss}	Drain cutoff current	$V_{DS} = V_{dss}$, $V_{GS} = 0\text{V}$	—	—	1	mA
$V_{GS(th)}$	Gate-source threshold voltage	$I_d = 10\text{mA}$, $V_{DS} = 10\text{V}$	4.7	6	7.3	V
I_{GSS}	Gate leakage current	$V_{GS} = V_{gss}$, $V_{DS} = 0\text{V}$	—	—	1.5	μA
$r_{DS(on)}$ (chip)	Static drain-source On-state resistance	$I_d = 100\text{A}$ $V_{GS} = 15\text{V}$	$T_j = 25^\circ\text{C}$	—	2.4	3.3
			$T_j = 125^\circ\text{C}$	—	4.1	—
$V_{DS(on)}$ (chip)	Static drain-source On-state voltage	$I_d = 100\text{A}$ $V_{GS} = 15\text{V}$	$T_j = 25^\circ\text{C}$	—	0.24	0.33
			$T_j = 125^\circ\text{C}$	—	0.41	—
$R_{DD-SS'}$	Internal lead resistance	$I_d = 100\text{A}$ terminal-chip	$T_j = 25^\circ\text{C}$	—	1.2	—
			$T_j = 125^\circ\text{C}$	—	1.68	—
C_{iss}	Input capacitance	$V_{DS} = 10\text{V}$	—	—	50	nF
C_{oss}	Output capacitance	$V_{GS} = 0\text{V}$	—	—	7	
C_{rss}	Reverse transfer capacitance		—	—	4	
Q_G	Total gate charge	$V_{DD} = 48\text{V}$, $I_d = 100\text{A}$, $V_{GS} = 15\text{V}$	—	760	—	nC
$t_{d(on)}$	Turn-on delay time		—	—	400	ns
t_r	Rise time		—	—	300	
$t_{d(off)}$	Turn-off delay time		—	—	450	
t_f	Fall time		—	—	300	
t_{rr}^{*1}	Reverse recovery time		—	—	250	
Q_{rr}^{*1}	Reverse recovery charge		—	3.6	—	μC
V_{sd}^{*1}	Source-drain voltage	$I_s = 100\text{A}$, $V_{GS} = 0\text{V}$	—	—	1.3	V
$R_{th(j-c)}$	Thermal resistance	MOSFET part (1/6 module) ^{*7}	—	—	0.30	K/W
		MOSFET part (1/6 module) ^{*3}	—	—	0.22	
$R_{th(c-s)}$	Contact thermal resistance	Case to fin, Thermal grease Applied ^{*8} (1/6 module)	—	0.1	—	
$R_{th(c'-s')}$		Case to fin, Thermal grease Applied ^{*3, *8} (1/6 module)	—	0.09	—	

NTC THERMISTOR PART

Symbol	Parameter	Conditions	Limits			Unit
			Min.	Typ.	Max.	
R_{25}^{*6}	Resistance	$T_{TH} = 25^\circ\text{C}^{*5}$	—	100	—	k Ω
B^{*6}	B Constant	Resistance at $T_{TH} = 25^\circ\text{C}$, 50°C^{*5}	—	4000	—	K

*1: It is characteristics of the anti-parallel, source to drain free-wheel diode (FWDI).

*2: Pulse width and repetition rate should be such that the device junction temperature (T_j) does not exceed T_j max rating.*3: T_c' measured point is just under the chips. If use this value, $R_{th(s-a)}$ should be measured just under the chips.

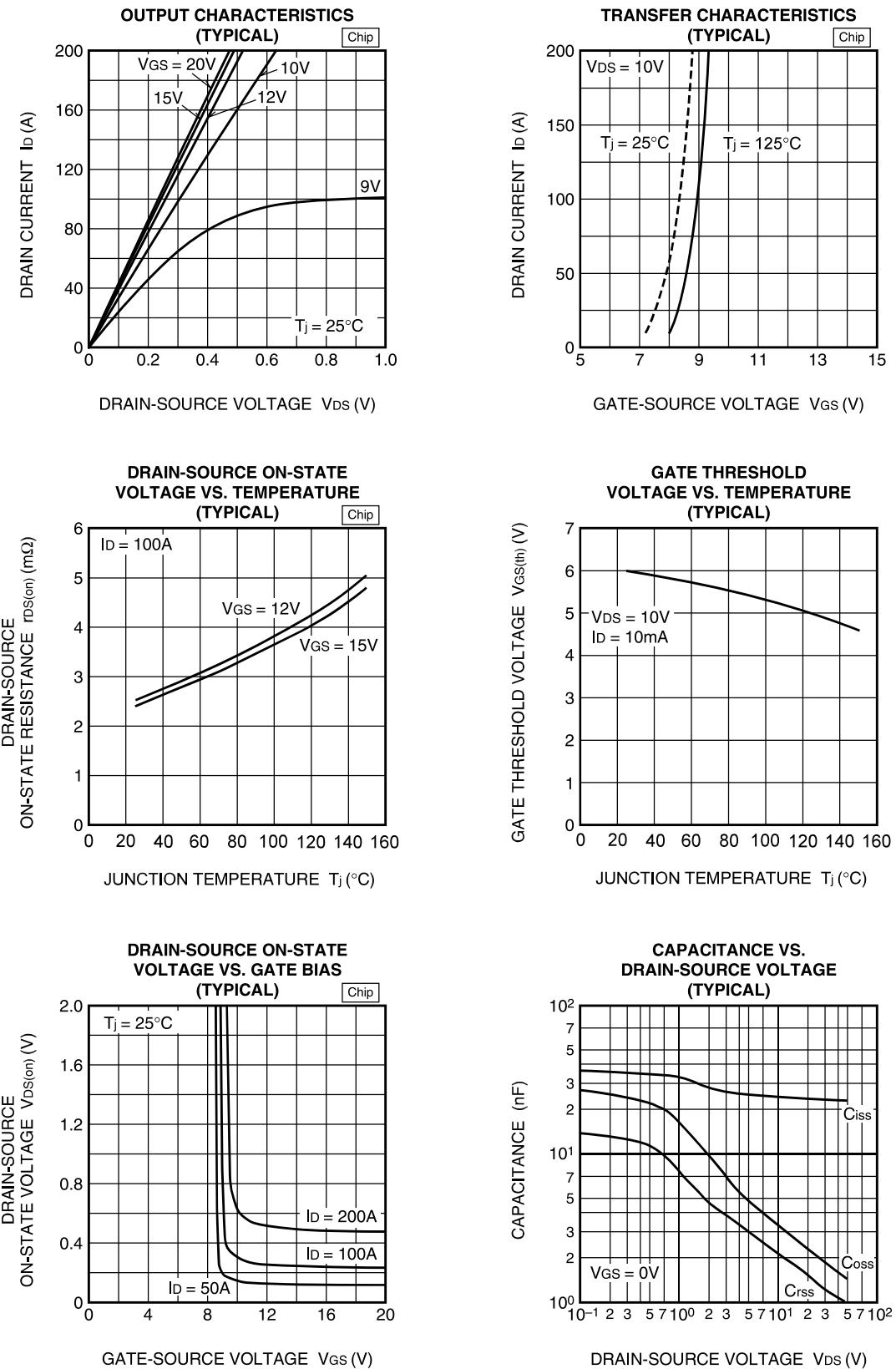
*4: Pulse width and repetition rate should be such as to cause negligible temperature rise.

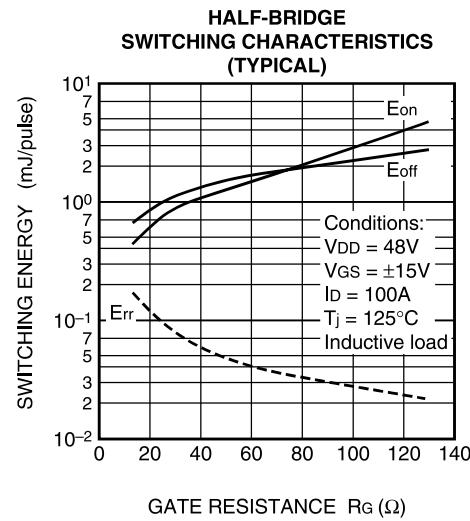
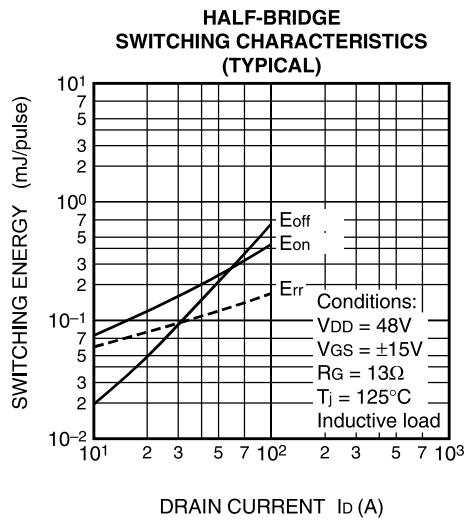
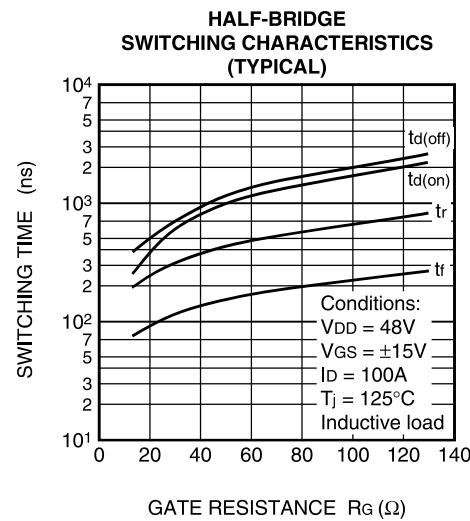
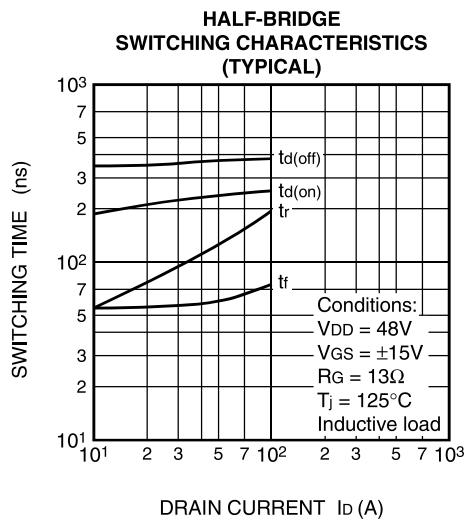
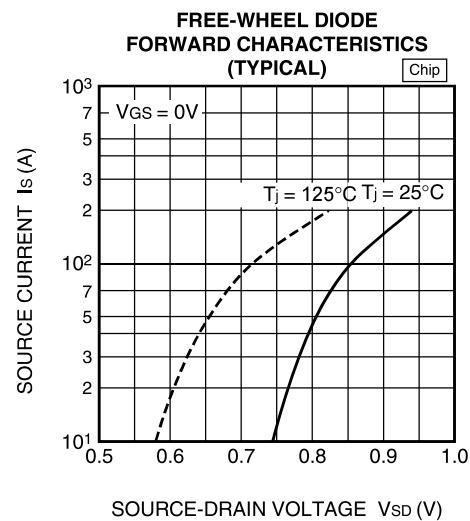
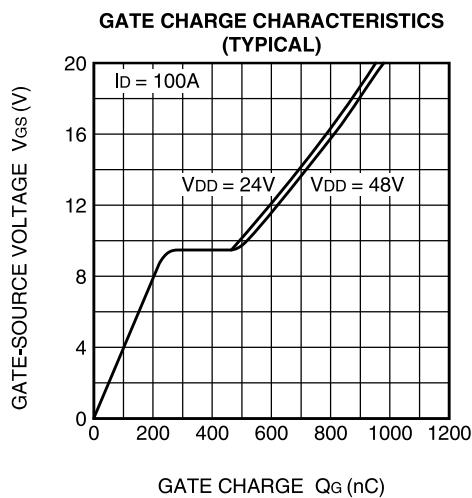
*5: T_{TH} is thermistor temperature.*6: $B = (\ln R_1 - \ln R_2) / (1/T_1 - 1/T_2)$ R_1 : Resistance at $T_1(\text{K})$, R_2 : Resistance at $T_2(\text{K})$ *7: T_c measured point is shown in page OUTLINE DRAWING.*8: Typical value is measured by using thermally conductive grease of $\lambda=0.9 \text{ W}/(\text{m}\cdot\text{K})$.

FM200TU-2A

HIGH POWER SWITCHING USE
INSULATED PACKAGE

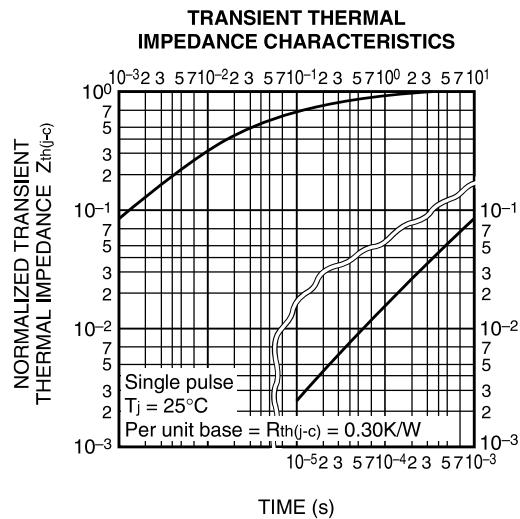
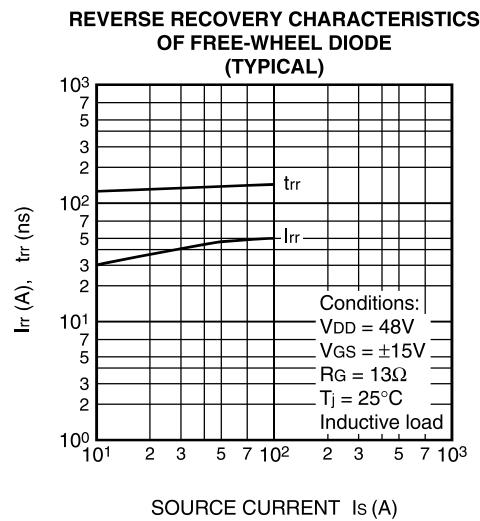
PERFORMANCE CURVES



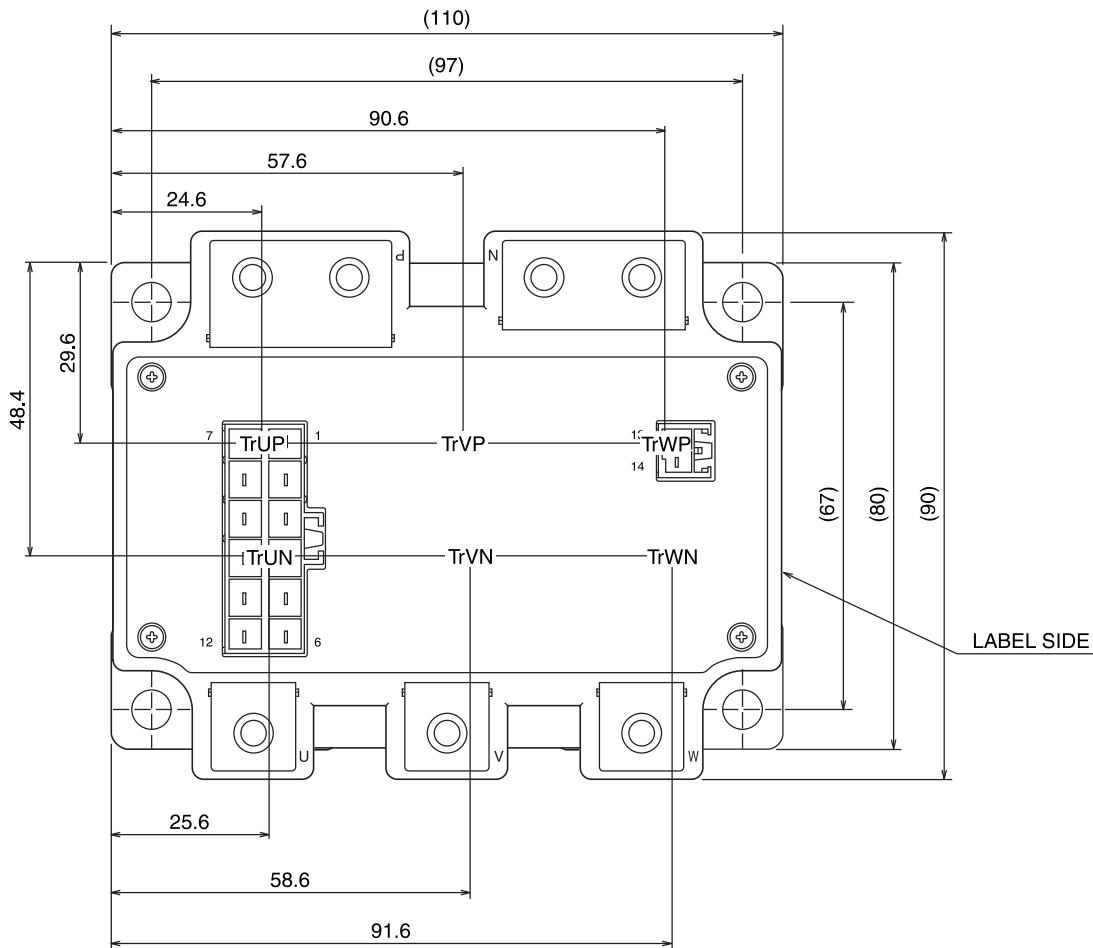


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CHIP LAYOUT



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Mar. 2013

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