

TENTATIVE

FM200TU-07A

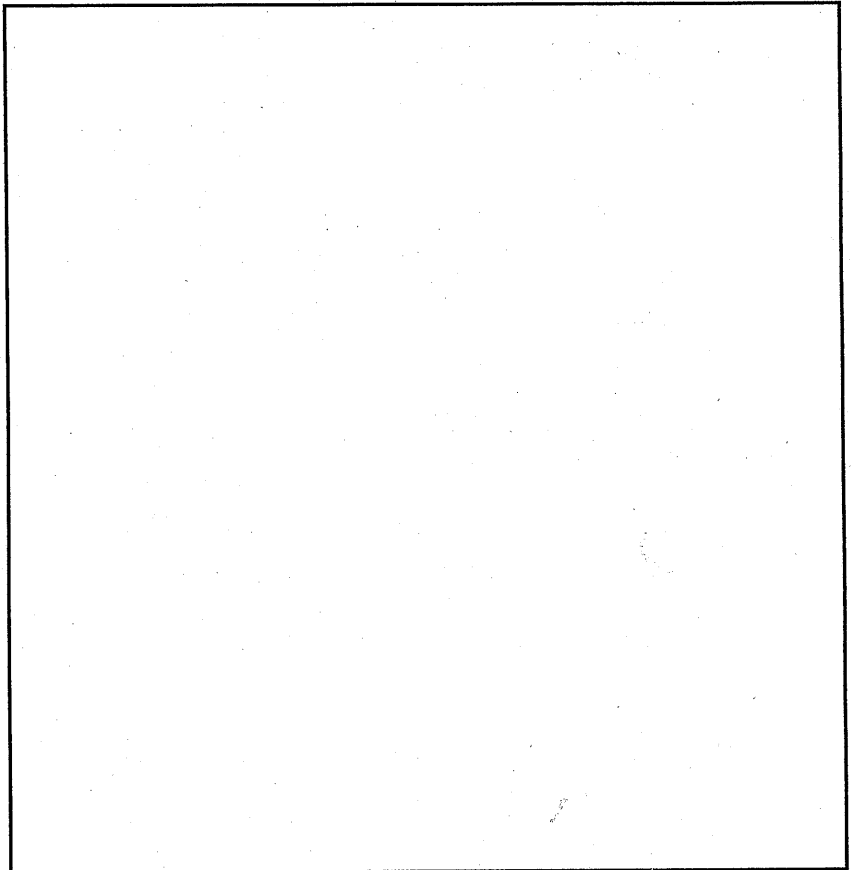
Pre.	M.Koura	Rev	B	M.Koura, N.Kashimoto, J.Yamada T. Furuike 28. Apr. '04
Apr.	T.Furuike 03-Mar.-'04			

HIGH POWER SWITCHING USE

Notice : This is not a final specification. Some parametric limits are subject to change.

FM200TU-07A

- $I_{D(rms)}$ 100A
- V_{DSS} 75V
- Insulated Type
- 6-elements in a pack



A
B

APPLICATION

AC motor control of forklift (battery power source)

ABSOLUTE MAXIMUM RATINGS ($T_{ch} = 25\text{ }^{\circ}\text{C}$)

Symbol	Item	Conditions	Ratings	Unit
V_{DSS}	Drain-source voltage	G-S Short	75	V
V_{GSS}	Gate-source voltage	D-S Short	± 20	V
$I_{D(rms)}$	Drain current	$T_c = 142\text{ }^{\circ}\text{C}$	100	$A_{(rms)}$
I_{DM}		Pulse ②	200	A
I_{DA}	Avalanche current	$L = 10\text{ }\mu\text{H}$ Pulse ②	100	A
$I_{S(rms)}$ ①	Source current		100	$A_{(rms)}$
I_{SM} ①		Pulse ②	200	A
P_D ③	Maximum power dissipation	$T_c = 25\text{ }^{\circ}\text{C}$	410	W
P_D ③	Maximum power dissipation	$T_c' = 25\text{ }^{\circ}\text{C}$	560^{*1}	W
T_{ch}	Channel temperature		$-40 \sim +150$	$^{\circ}\text{C}$
T_{stg}	Storage temperature		$-40 \sim +125$	$^{\circ}\text{C}$
V_{iso}	Isolation voltage	Main terminal to base plate, AC 1 min.	2500	V
—	Mounting torque	Main Terminal M 6	3.5~4.5	N·m
		Mounting M 6	3.5~4.5	N·m
—	Weight	Typical value	600	g

B
B
B

TENTATIVE**FM200TU-07A**

HIGH POWER SWITCHING USE

ELECTRICAL CHARACTERISTICS ($T_{ch} = 25\text{ }^{\circ}\text{C}$)

Symbol	Item	Conditions	Min.	Typ.	Max.	Unit	
I_{DSS}	Drain cutoff current	$V_{DS}=V_{DSS}, V_{GS}=0V$	—	—	1	mA	
$V_{GS(th)}$	Gate-source threshold voltage	$I_D=10mA, V_{DS}=10V$	4.7	6	7.3	V	
I_{GSS}	Gate leakage current	$V_{GS}=V_{GSS}, V_{DS}=0V$	—	—	1.5	μA	
$r_{DS(ON)}$ (chip)	Static drain-source On-state resistance	$I_D=100A$ $V_{GS}=15V$	$T_{ch}=25\text{ }^{\circ}\text{C}$	—	1.2	1.65	m Ω
			$T_{ch}=125\text{ }^{\circ}\text{C}$	—	1.92	—	
$V_{DS(ON)}$ (chip)	Static drain-source On-state voltage	$I_D=100A$ $V_{GS}=15V$	$T_{ch}=25\text{ }^{\circ}\text{C}$	—	0.12	0.165	V
			$T_{ch}=125\text{ }^{\circ}\text{C}$	—	0.192	—	
$R_{(lead)}$	Lead resistance	$I_D=100A$ terminal-chip	$T_{ch}=25\text{ }^{\circ}\text{C}$	—	1.2	—	m Ω
			$T_{ch}=125\text{ }^{\circ}\text{C}$	—	1.68	—	
C_{iss}	Input capacitance	$V_{DS}=10V$ $V_{GS}=0V$	—	—	50	nF	
C_{oss}	Output capacitance		—	—	7		
C_{rss}	Reverse transfer capacitance		—	—	4		
Q_G	Total gate charge	$V_{DD}=48V, I_D=100A, V_{GS}=15V$	—	700	—	nC	
$t_{d(on)}$	Turn-on delay time	$V_{DD}=48V, I_D=100A$ $V_{GS1}=V_{GS2}=15V$ $R_G=13\Omega$, Inductive load switching operation	—	—	450	ns	
t_r	Turn-on rise time		—	—	400		
$t_{d(off)}$	Turn-off delay time		—	—	600		
t_f	Turn-off fall time		—	—	400		
t_{rr} ①	Reverse recovery time		$I_S=100A$	—	—		200
Q_{rr} ①	Reverse recovery charge		—	2.0	—	μC	
V_{SD} ①	Source-drain voltage	$I_S=100A, V_{GS}=0V$	—	—	1.3	V	
$R_{th(ch-c)}$	Thermal resistance	MOSFET part(1/6 module)	—	—	0.30	$^{\circ}\text{C/W}$	
$R_{th(ch-c)}$		MOSFET part(1/6 module)	—	—	0.22*1		
$R_{th(c-f)}$		Contact thermal resistance	Case to fin, Thermal compound Applied *2 (1/6 module)	—	0.1		—

Thermistors part

Symbol	Parameter	Condition	Min.	Typ.	Max.	Unit
R_{TH} ④	Resistance	$T_C=25^{\circ}\text{C}$	—	100	—	k Ω
B ④	B Constant	Resistance at $25^{\circ}\text{C}, 50^{\circ}\text{C}$	—	4000	—	K

① I_S, V_{SD}, t_{rr} & Q_{rr} represent characteristics of the anti-parallel, source to drain free-wheel diode (FWD).② Pulse width and repetition rate should be such that the device channel temp. (T_{ch}) dose not exceed T_{ch} max rating.③ Channel temperature (T_{ch}) should not increase beyond 150°C .④ $B = (\ln R_1 - \ln R_2) / (1/T_1 - 1/T_2)$ R_1 : Resistance at $T_1(K)$, R_2 : Resistance at $T_2(K)$ *1: 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.

*2: Typical value is measured by using Shin-etsu Silicone "G-746".

*3: T_c measured point is shown in page "3-4".

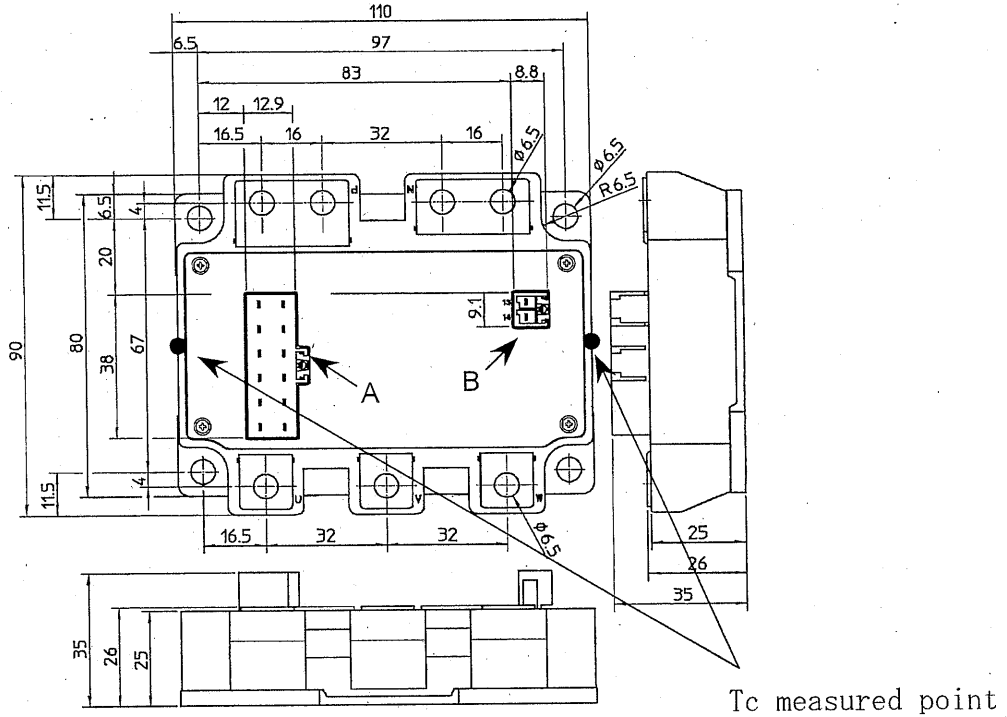
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HIGH POWER SWITCHING USE

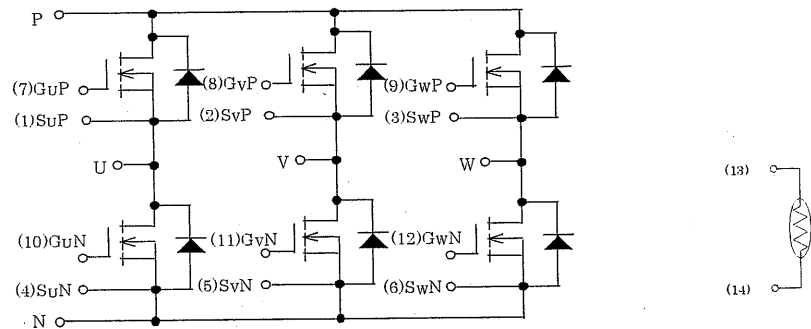
OUTLINE DRAWING

Dimensions in mm



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

CIRCUIT DIAGRAM



(1) SUP	(2) SVP	(3) SWP	(4) SUN	(5) SVN	(6) SWN	A
(7) GUP	(8) GVP	(9) GWP	(10) GUN	(11) GVN	(12) GWN	B
(13) TH1	(14) TH2					

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