

Ratings and characteristics of Fuji IGBT (MBT) Module

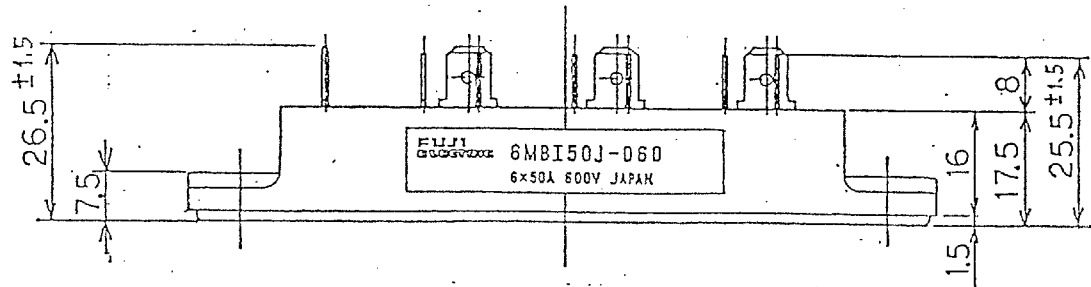
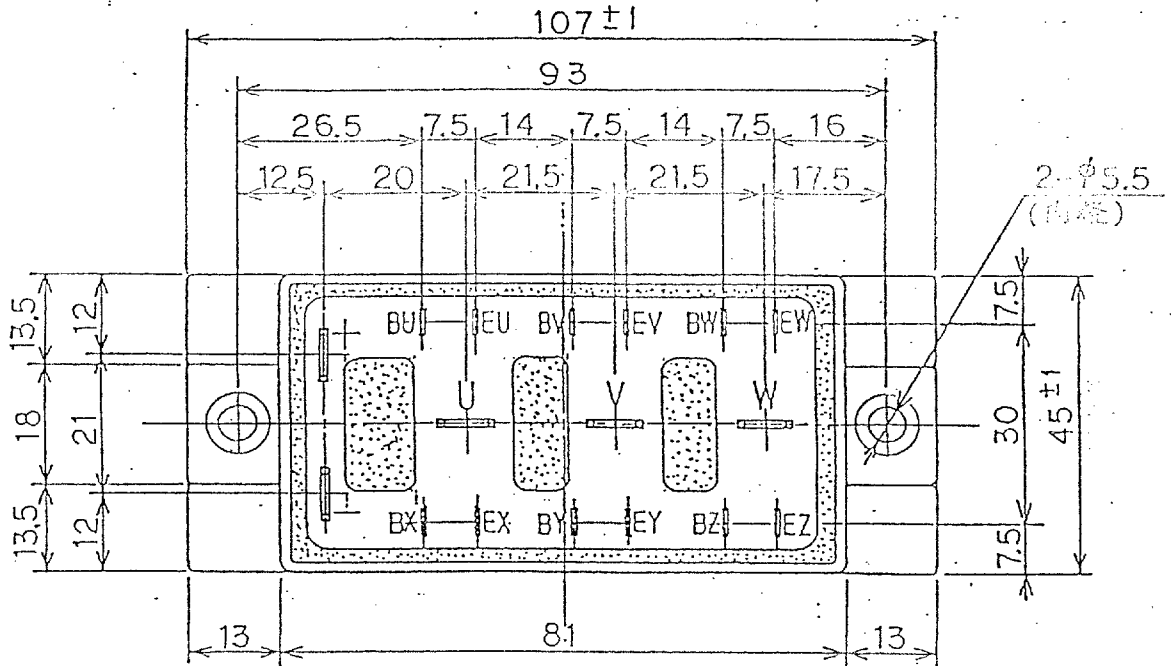
6MBI50J-060 (TENTATIVE)

1. Outline Drawing

Unit : mm

* Isolation Voltage : AC 2500 V 1 minute

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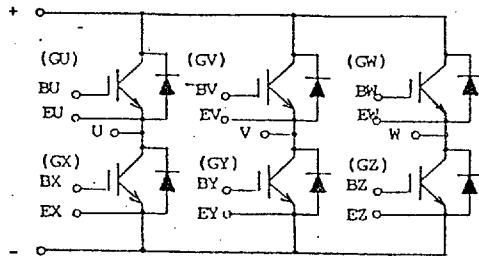


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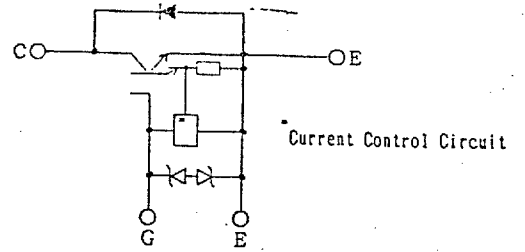
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2. Equivalent Circuit of Module



3. Equivalent Circuit



4. Absolute Maximum Ratings (Tj=25 °C)

Items		Symbols	Ratings	Units
Collector-emitter voltage		V_{CES}	600	V
Gate-emitter voltage		V_{GES}	± 20	V
Collector current	Continuous	I_c	50	A
	1 ms	I_c pulse	100	
		$-I_c$	50	
	1 ms	$-I_c$ pulse	100	
Max.power dissipation		PC	150	W
Operating temperature		T_j	+150	°C
Storage temperature		T_{stg}	-40 ~ +125	°C
Isolation voltage		V_{is}	AC 2500 (1 min)	V
Screw Torque		Mounting *1	3.5	N·m

Note : *1 Recommendable Value : 2.5 ~ 3.5 N·m (M5)

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5. Static electrical characteristics (at $T_j=25^\circ\text{C}$ unless otherwise specified)

Items	Symbols	Characteristics			Conditions		Units
		min.	typ.	max.			
Zero gate voltage collector current	I_{CES}			1.0	$T_j = 25^\circ\text{C}$	$V_{GE} = 0\text{V}$ $V_{CE} = 600\text{V}$	m A
					$T_j = 125^\circ\text{C}$		m A
Gate-emitter leakage current	I_{GES}			15	$V_{CE} = 0\text{V}$ $V_{GE} = \pm 20\text{V}$		μA
Gate-emitter threshold voltage	$V_{GE(th)}$	3.5	5.0	6.5	$V_{CE} = 20\text{V}$ $I_C = 50\text{mA}$		V
Collector-emitter saturation voltage	$V_{CE(sat)}$		1.7	2.5	$V_{GE} = 15\text{V}$ $I_C = 50\text{A}$		V

6. Dynamic ratings (at $T_j=25^\circ\text{C}$ unless otherwise specified)

Items	Symbols	Characteristics			Conditions	Units
		min.	typ.	max.		
Input capacitance	C_{ies}		3200		$V_{GE} = 0\text{V}$	p F
Output capacitance	C_{oes}				$V_{CE} = 10\text{V}$	
Reverse transfer capacitance	C_{res}				$f = 1\text{MHz}$	
Turn-on time	t_{on}		0.6	1.2	$V_{CC} = 300\text{V}$ $I_C = 50\text{A}$ $V_{GE} = \pm 15\text{V}$ $R_g = 51\Omega$	μs
	t_r		0.2	0.6		
Turn-off time	t_{off}		0.8	1.5		
	t_f		0.15	0.35		

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7. Characteristics of reverse diode (at $T_j=25^\circ\text{C}$ unless otherwise specified)

Items	Symbols	Characteristics			Conditions	Units
		min.	typ.	max.		
Diode forward on-voltage	V _F		2.3	3.0	I _F = 50A V _{GE} = 0V	V
Reverse recovery time	t _{rr}			300	I _F = 50A -di/dt = 150A/μs	ns

8. Thermal resistance characteristics

Items	Symbols	Characteristics			Conditions	Units
		min.	typ.	max.		
Thermal resistance	R _{th(j-c)}			0.833	IGBT	°C/W
	R _{th(j-c)}			2.00	Diode	
	* R _{th(c-f)}		0.05		the base to cooling fin	

* This is the value which is defined mounting on the additional cooling fin with thermal compound.

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