(Target Spec.) TOSHIBA GTR MODULE

MG1200FXF1US53

S ILICON N-CHANNEL IGBT

HIGH POWER SWITCHING APPLICATIONS.

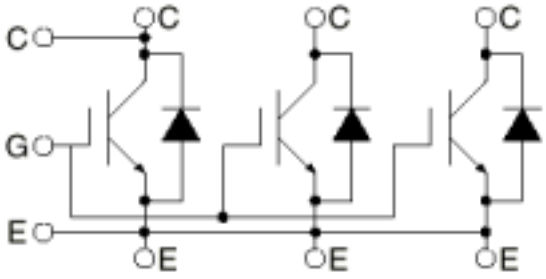
MOTOR CONTROL APPLICATIONS.

Features ●High Input Impedance

●Enhancement Mode

●Electrodes are Isolated from Case

EQUIVALENT CIRCUIT



MAXIMUM RATINGS (Ta=25degC)

Characteristic		Symbol	Rating	Unit
Collector-Emitter Voltage		V_{CES}	3300	V
Gate-Emitter Voltage		V_{GES}	+/-20	V
Collector Current	RMS	I_C	1200 (Note.1)	A
	Peak Turn off current	I_{CP}	2400 (Note.2)	A
Peak 1 cycle surge Current	10ms(half sine)	I_{FSM}	10	kA
Collector Power Dissipation		Pc	4000	W
Operating Junction Temperature		T_j	-40...125	degC
Storage Temperature Range		T_{stg}	-40...125	degC
Isolation Voltage		V_{Isol}	6000 (AC 1MIN.)	V
Screw Torque	Terminal:M4/M8	-	2/7	Nm
	Mounting		4	

Note.1 50Hz(Half Sine), Tc=75degC, Switching Loss is not contained.

Note.2 Vcc=<2200V, Vcp=<2700V, Ls=160nH, RG=9.1ohm, VGE=+/-15V, Tj=<125 degC

(Target Spec.)

ELECTRICAL CHARACTERISTICS(Tvj=125 degC)

Characteristic		Symbol	Test condition	Min.	Typ.	Max.	Unit
Gate leakage current		I_{GES}	V_{GE}=+/-20V, V_{CE}=0V	-	-	+/-50	nA
Collector cut-off current		I_{CES}	V_{CE}=3300V, V_{GE}=0V	-	75	100	mA
Gate-Emitter cut-off voltage		$V_{GE(off)}$	V_{CE}=5V, I_C=1.2A	-	7.2	-	V
Collector-Emitter saturation voltage		$V_{CE(sat)}$	I_C=1200A,V_{GE}=15V	-	4.2	4.5	V
Input capacitance		C_{ies}	V_{CE}=10V, V_{GE}=0V, f=100kHz	-	230	-	nF
Switching time	Rise time	t_r	V_{CC}=1800V, I_C=1200A, V_{GG}=+/-15V, RG(on)/(off)=3.0/9.1Ω (di_C/dt(on)<>4500A/μs) (Inductive Load, Ls=160nH)	-	0.3	-	μs
	Turn-on time	t_{on}		-	0.8	-	μs
	Fall time	t_f		-	1.2	-	μs
	Turn-off time	t_{off}		-	4.9	-	μs
Forward voltage of Diode		V_F	I_F=1200A,V_{GE}=0V	-	3.1	3.5	V
Reverse recovery charge		Qrr	I_F=1200A,V_{GG}=-15V, di_F/dt<>-4500A/μs, V_{CC}=1800V	-	1000	-	μC
Peak reverse recovery current		Irr		-	1400	-	A
Switching dissipation	turn-on loss	Eon	V_{CC}=1800V, I_C=1200A, V_{GG}=+/-15V, RG(on)/(off)=3.0/9.1Ω (di_C/dt(on)<>4500A/μs) (Inductive Load, Ls=160nH)	-	2.0	-	J
	turn-off loss	Eoff		-	1.7	-	J
	Diode Reverse recovery loss	Edsw	I_F=1200A,V_{GG}=-15V, di_F/dt□4500A/μs, V_{CC}=1800V	-	1.3	-	J

Thermal Resistance(Tc=25 degC)

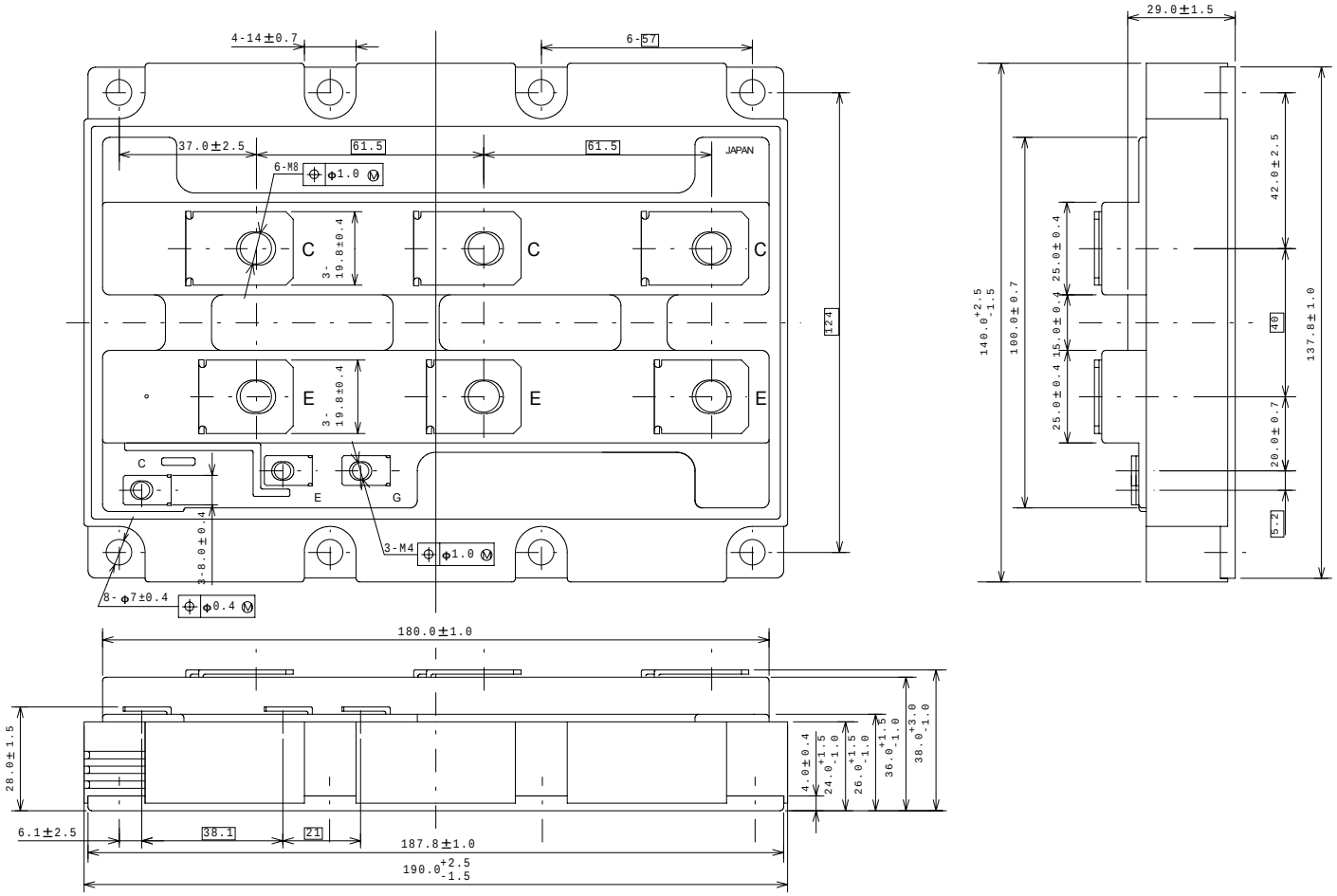
Thermal Resistance	$R_{th(j-C)}$	Transistor(IGBT) Stage	-	-	8.0	degC /kW
		Diode Stage	-	-	16.0	
	$R_{th(C-f)}$	per Module(Note.3)	-	6.0	-	

Note.3:Toshiba Silicone's YG6260 heat radiation grease is recommended for use with semiconductor devices. Apply a thin , even(100-to-200-um) coating of grease.

(Target Spec.)

Outline

Unit:mm



(Target Spec.)

RESTRICTIONS ON PRODUCT USE

000707EAA

- TOSHIBA is continually working to improve the quality and the reliability of its products. Nevertheless, semiconductor devices in general can malfunction or fail due to their inherent electrical sensitivity and vulnerability to physical stress. It is the responsibility of the buyer, when utilizing TOSHIBA products, to comply with the standards of safety in making a safe design for the entire system, and to avoid situations in which a malfunction or failure of such TOSHIBA product could cause loss of human life, bodily injury or damage to property.
  In developing your designs, please ensure that TOSHIBA products are used within specified operating ranges as set forth in the most recent products specifications. Also, please keep in mind the precautions and conditions set forth in the "Handing Guide for Semiconductor Devices," or "TOSHIBA Semiconductor Reliability Handbook" etc..
- The Toshiba products listed in this document are intended for usage in general electronics applications (computer, personal equipment, office equipment, measuring equipment, industrial robotics, domestic appliances, etc.). These Toshiba products are neither intended nor warranted for usage in equipment that requires extraordinarily high quality and/or reliability or a malfunction or failure of which may cause loss of human life or bodily injury ("Unintended Usage"). Unintended Usage include atomic energy control instruments, airplane or spaceship instruments, transportation instruments, traffic signal instruments, combustion control instruments, medical instruments, all types of safety devices, etc.. Unintended Usage of Toshiba products listed in this document shall be made at the customer's own risk.
- The information contained herein in presented only as a guide for the applications of our products. No responsibility is assumed by TOSHIBA CORPORATION for any infringements of intellectual property or other rights of the third parties which may result from its use. No license is granted by implication or otherwise under any intellectual property or other rights of TOSHIBA CORPORATION or others.
- The information contained herein is subject to change without notice.