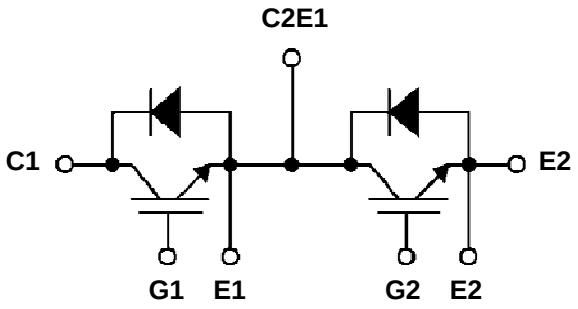
X2G200SD12P3

HIGH POWER SPT+ TYPE 2-PACK IGBT MODULE

1200V
200A

PACKAGE : M3

CIRCUIT DIAGRAM



FEATURES

- Soft Punch Through (SPT+) Technology
- Fast & soft inverse CAL diodes
- 10us short circuit capability
- Positive $V_{CE(on)}$ temperature coefficient
- Industry standard package

APPLICATIONS

- High power inverter
- Switched mode power supplies (SMPS)
- UPS
- Electrical welding machine

ABSOLUTE MAXIMUM RATINGS

T_c=25℃, unless otherwise specified

Symbol	Parameter	Conditions	Ratings	Unit
V_{CES}	Collector-emitter voltage	-	1200	V
I_C	DC-collector current	T_C = 25℃	275	A
		T_C = 80℃	200	A
I_{CRM}	Repetitive peak collector current	Tp=1ms T_C = 80℃	400	A
V_{GES}	Gate-emitter peak voltage	-	±20	V
I_F	Diode continuous forward current	-	200	A
I_{FRM}	Diode repetitive peak forward current	-	400	A
$T_{vj,max}$	Maximum junction temperature	-	-40 ~ 150	℃
$T_{vj,op}$	Operating temperature range	-	-40 ~ 125	℃
T_{stg}	Storage temperature range	-	-40 ~ 125	℃
V_{ISOL}	Insulation test voltage	50/60Hz, t=1min I_{ISOL}=1mA	2.5	kV
M_S	Mounting screw torque	M6	3.0 ~ 6.0	N.m
M_t	Mounting terminals screw torque	M6	2.5 ~ 5.0	N.m

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■ ELECTRICAL CHARACTERISTICS OF IGBT

T_J=25℃ unless otherwise specified

Symbol	Parameter	Min	Typ	Max	Unit	Conditions
$V_{CE(Sat)}$	C-E saturation voltage	-	1.8	-	V	I_C = 200A, V_{GE} = 15V, T_{vj} = 25℃
		-	2.0	–	V	I_C = 200A, V_{GE} = 15V, T_{vj} = 125℃
$V_{GE(th)}$	G-E threshold voltage	5.0	6.2	7.0	V	I_C = 4mA , V_{CE} = V_{GE}
I_{CES}	Zero gate voltage collector current	-	-	100	μA	V_{GE} = 0V , V_{CE} = 1200V
I_{GES}	G-E leakage current	-200	-	200	nA	V_{GE} = ±20V
R_{Gint}	Internal gate resistance	-	1.0	-	Ω	-
C_{ies}	Input capacitance	-	24.37	-	nF	V_{GE} = 0V, f = 1MHz, V_{CE} = 25V, T_{vj} = 25℃
C_{oes}	Output capacitance	-	1.625	-		
C_{res}	Reverse transfer capacitance	-	1.45	-		
Q_g	Total gate charge	-	2100	-	nC	V_{GE} = ±15V
$t_{d(on)}$	Turn-on delay time	-	180	-	ns	V_{CE} = 600V, I_C = 200A, V_{GE} = ±15V, R_G = 5.1Ω, Tv_j = 125℃
t_r	Turn-on rise time	-	85	-		
$t_{d(off)}$	Turn-off delay time	-	520	-		
t_f	Turn-off fall time	-	100	-		
E_{ON}	Turn-on Energy loss	-	12.9	-	mJ	
E_{OFF}	Turn-off Energy loss	-	9	-		

■ ELECTRICAL CHARACTERISTICS OF FRD

T_J=25℃ unless otherwise specified

Symbol	Parameter	Min	Typ	Max	Unit	Conditions	
V_F	Diode Forward Voltage Drop	-	1.6	-	V	T_{vj} = 25℃	I_F = 200A
		-	1.6	-		T_{vj} = 125℃	
I_{rr}	Peak Reverse Recovery Current	-	92	-	A	I_F = 200A, V_{CE} = 600V, V_{GE} = 15V	T_{vj} = 125℃
Q_{rr}	Diode Recovery Charge	-	34	-	μC		

■ THERMAL AND MECHANICAL CHARACTERISTICS

T_J=25℃ unless otherwise specified

Symbol	Parameter	Min	Typ	Max	Unit	Condition
Rth(j-c)	Junction-to-Case (IGBT Part,Per 1/2 Module)	-	0.08	-	℃/W	
Rth(j-c)	Junction-to-Case (FRD Part,Per 1/2 Module)	-	0.25	-	℃/W	
Rth(c-f)	Case-to-Heat Sink (With Thermal Compound)	-	0.03	-	℃/W	
Weight	Module		320		g	

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PERFORMANCE CURVES (I)

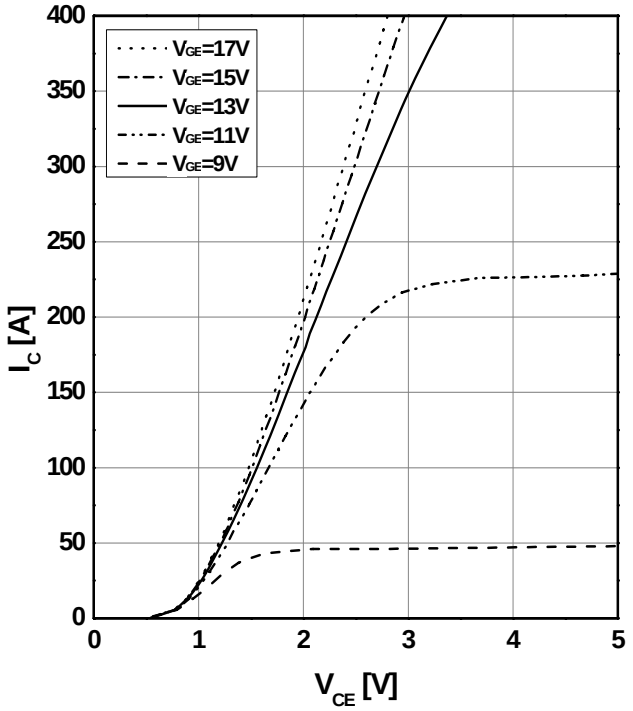

Fig1. Typical Output Characteristics

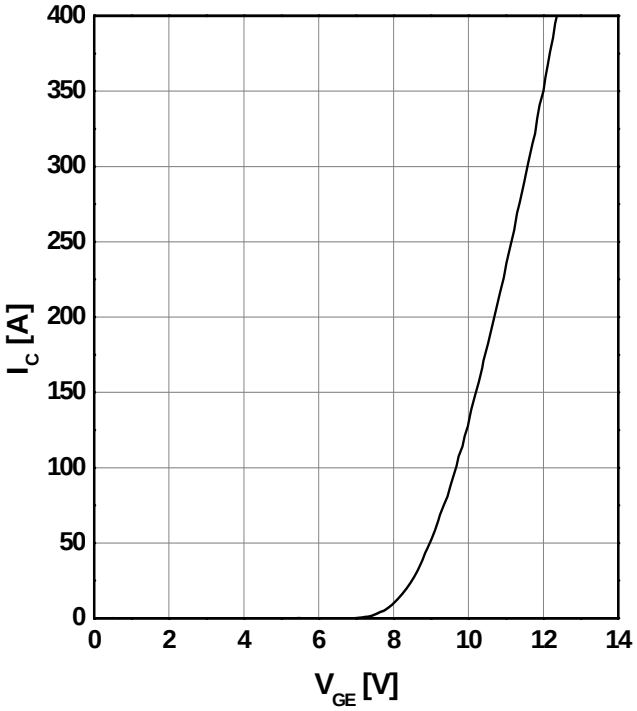

Fig2. Transfer Characteristics

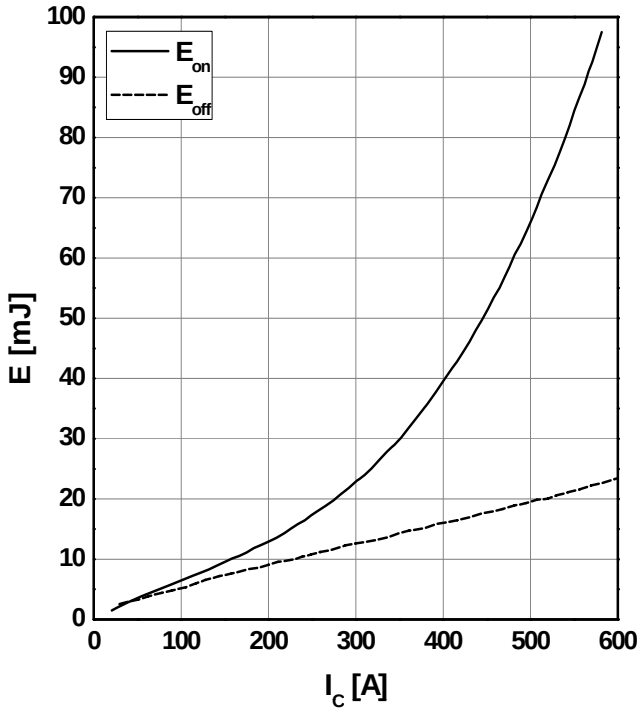

Fig3. Energy Loss vs. I_C

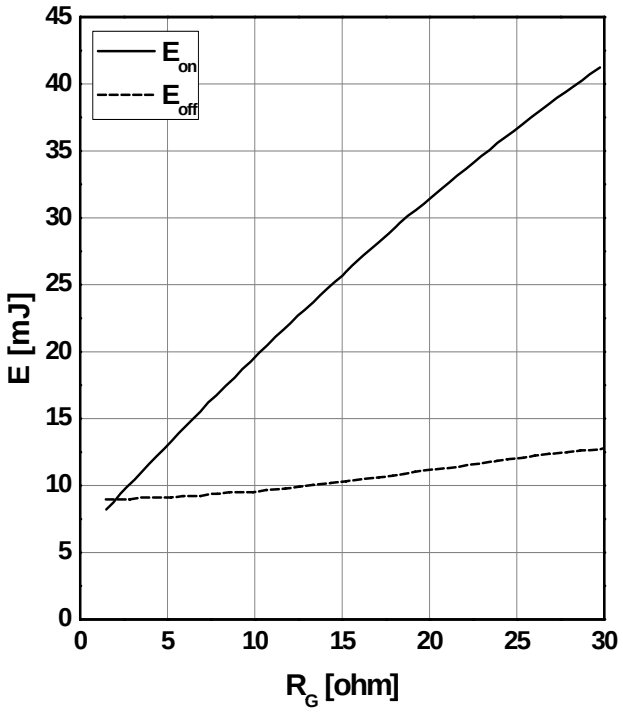

Fig4. Energy Loss vs. R_G

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PERFORMANCE CURVES (II)

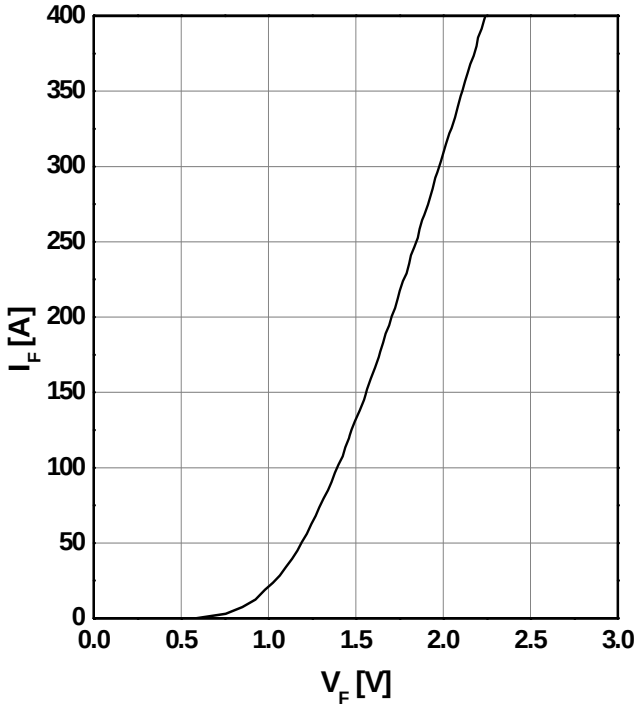

Fig5. DIODE Forward Characteristic

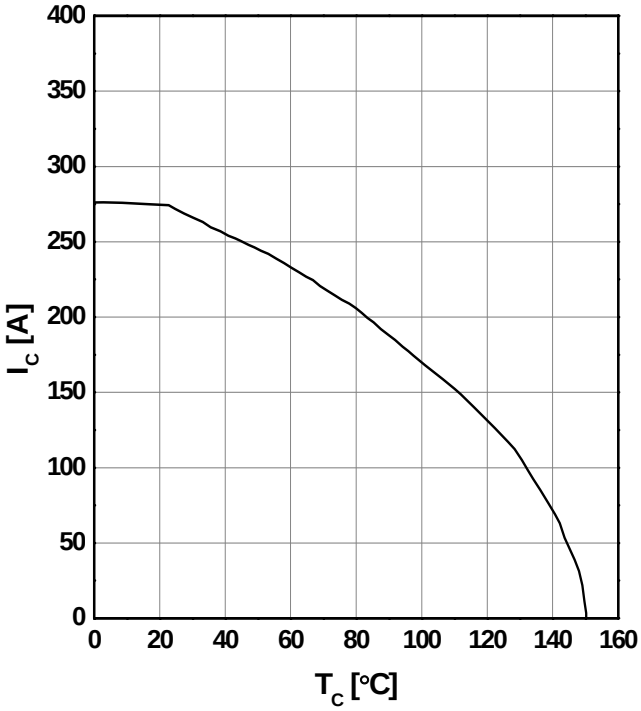

Fig6. Reverse Bios SOA (T_{vj} = 125℃)

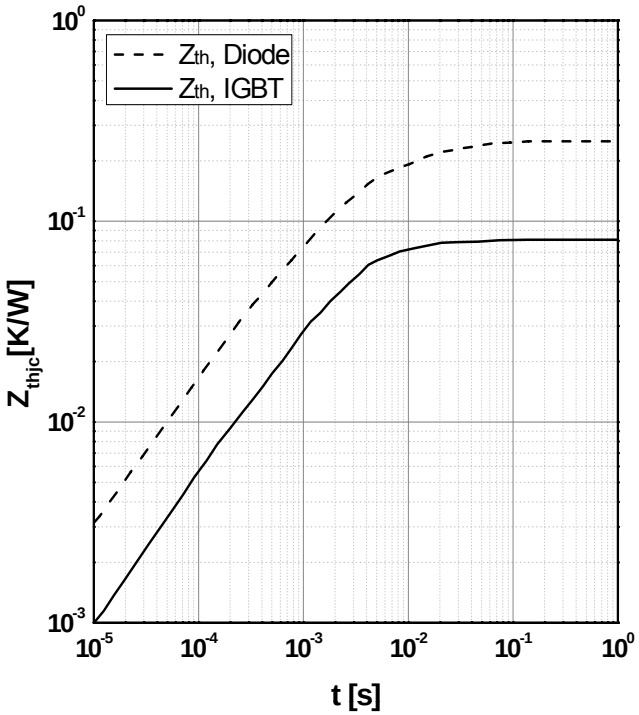

Fig7. Transient Thermal

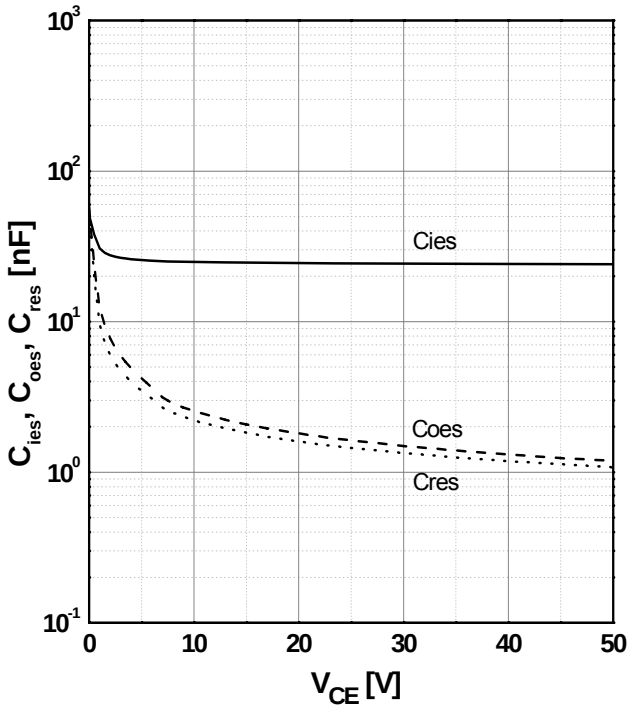

Fig8. Typ. Capacitance

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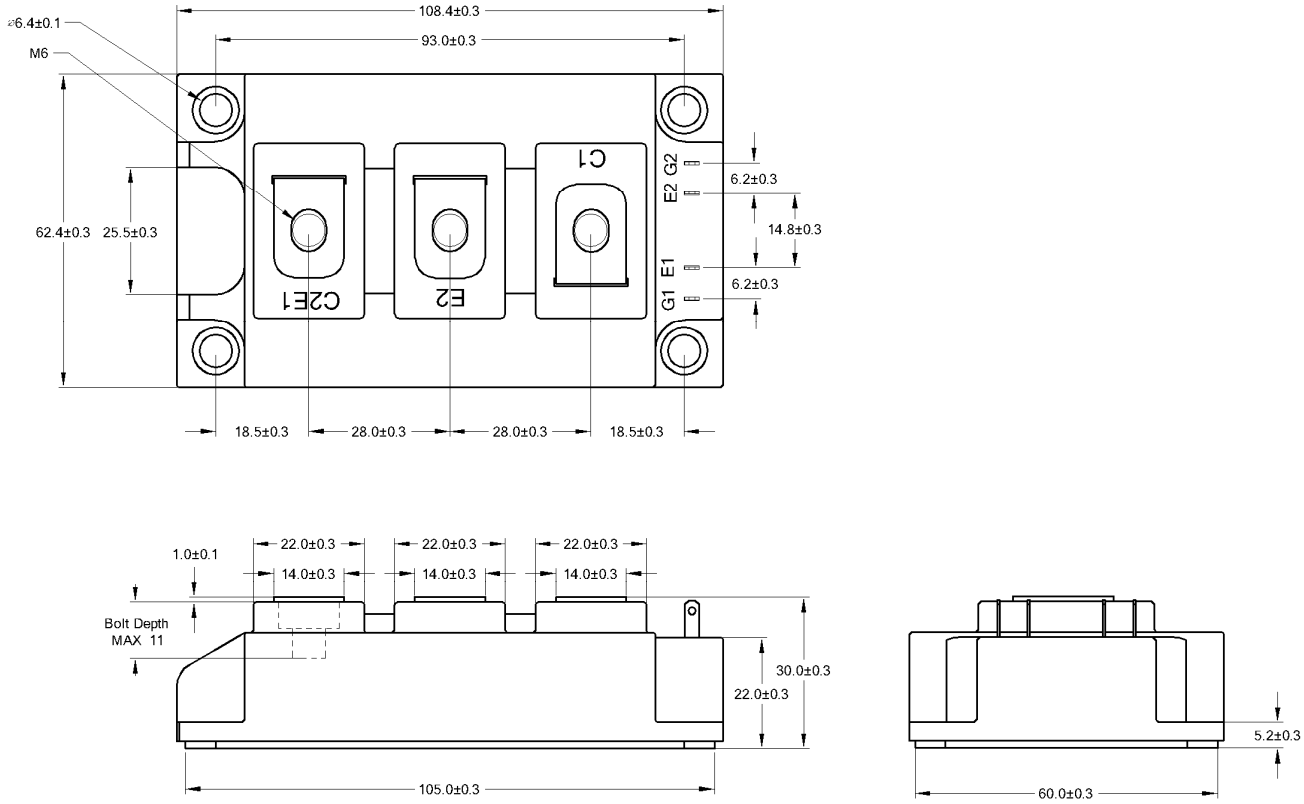
PACKAGE OUTLINES



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