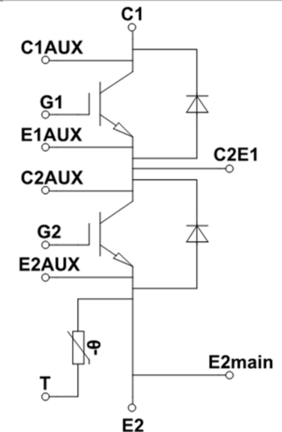
MBM1200GS17G2

Target Specification

Silicon N-channel Side-gate HiGT and Ex-SFD 1700V G2 Version



Circuit diagram

FEATURES

- Superior thermal reliability by sintered Cu bonding
- Low power dissipation by side-gate HiGT
- Soft & fast recovery characteristic
- Low noise & easy drive through low Cies and Cres of side-gate HiGT
- High current density & half-bridge nHPD^2 module
- Scalable large current easily handled by paralleling
- Low stray inductance & low Rth(j-c)
- Built in temperature sensor
- Equipped with current sensing terminals

HiGT : High-conductivity IGBT
nHPD^2 : next High Power Density Dual

ABSOLUTE MAXIMUM RATINGS (Tc=25°C)

Item		Symbol	Unit	MBM1200GS17G2
Collector Emitter Voltage		V_{CES}	V	1,700
Gate Emitter Voltage		V_{GES}	V	±20
Collector Current	DC	I_C	A	1,200
	1ms	I_{CP}		2,400
Forward Current	DC	I_F	A	1,200
	1ms	I_{FM}		2,400
Junction Temperature		$T_{vj\ op}$	°C	-50 ~ +175
Storage Temperature		T_{stg}	°C	-55 ~ +150
Isolation Voltage		V_{ISO}	V_{RMS}	4,000(AC 1 minute)
Screw Torque	Terminals (M3/M8)	M	N·m	0.8/15
	Mounting (M6)	M		6.0 (1)

Notes: (1) Recommended Value 5.5±0.5N·m

ELECTRICAL CHARACTERISTICS

Item		Symbol	Unit	Min.	Typ.	Max.	Test Conditions
Collector Emitter Cut-Off Current		I_{CES}	mA	-	1	20	V_{CE}=1,700V, V_{GE}=0V, T_{vj}=25°C
				-	50	-	V_{CE}=1,700V, V_{GE}=0V, T_{vj}=175°C
Gate Emitter Leakage Current		I_{GES}	nA	-500	-	+500	V_{GE}=±20V, V_{CE}=0V, T_{vj}=25°C
Collector Emitter Saturation Voltage		$V_{CE(sat)}$	V	1.50	1.95	2.35	I_C=1,200A, V_{GE}=15V, T_{vj}=25°C
				-	2.45	-	I_C=1,200A, V_{GE}=15V, T_{vj}=175°C
Gate Emitter Threshold Voltage		$V_{GE(th)}$	V	6.0	7.0	8.0	V_{CE}=10V, I_C=1,200mA, T_{vj}=25°C
Input Capacitance		C_{ies}	nF	-	46	-	V_{CE}=10V, V_{GE}=0V, f=100kHz, T_{vj}=25°C
Internal Gate Resistance		$R_{g(int)}$	Ω	-	6.8	-	V_{CE}=10V, V_{GE}=0V, f=100kHz, T_{vj}=25°C
Switching Times	Rise Time	t_r	µs	-	0.25	-	V_{CC}=900V, I_C=1,200A
	Turn On Time	t_{on}		-	0.85	-	Ls=40nH (2)
	Fall Time	t_f		-	0.55	-	R_G(on/off)=2.2Ω/2.2Ω (3)
	Turn Off Time	t_{off}		-	1.30	-	V_{GE}=±15V, T_{vj}=175°C
Peak Forward Voltage Drop		V_F	V	1.40	1.85	2.30	I_F=1,200A, V_{GE}=0V, T_{vj}=25°C
				-	2.05	-	I_F=1,200A, V_{GE}=0V, T_{vj}=175°C
Reverse Recovery Time		t_{rr}	µs	-	0.75	-	V_{CC}=900V, Ic=1,200A, Ls =40nH (2)
Turn-on Loss per Pulse		E_{on}	J/P	-	0.46	-	R_G(on/off)=2.2Ω/2.2Ω (3)
Turn-off Loss per Pulse		E_{off}	J/P	-	0.46	-	V_{GE}=±15V, T_{vj}=175°C
Reverse Recovery Loss per Pulse		E_{rr}	J/P	-	0.47	-	
Short Circuit Pulse Width		t_{SC}	µs	6	-	-	V_{CC}=1300V,Ls=40nH R_G(on/off)=2.2/82Ω,V_{GE}=±15V,Tvj=tbd
Stray Inductance in Module		L_{SCE}	nH	-	9	-	Between C1(main) and E2(main)
NTC-Thermistor	Resistance	R_{25}	kΩ	-	5	-	Tc=25 °C
	Deviation	ΔR/R	%	-5		5	Tc=25 °C
	B-constant	$B_{(25/50)}$	K	-	3375	-	Between 25 °C and 50 °C
Thermal Impedance	IGBT	Rth(j-c)	K/W	-	-	0.032	Junction to case
	FWD	Rth(j-c)		-	-	0.053	
Contact Thermal Impedance		Rth(c-f)	K/W	-	0.02	-	Case to fin (per 1 arm)

Notes: (2)(3)Ls and R_G are the test condition's values for evaluation of the switching times, not recommended value.
Please determine the suitable R_G value by measuring switching behavior and checking results with the respective SOA.

* Please contact our representatives at order.
* For improvement, specifications are subject to change without notice.
* For actual application, please confirm this spec sheet is the newest revision.
* ELECTRICAL CHARACTERISTIC values according to IEC 60747–2 IEC 60747–9

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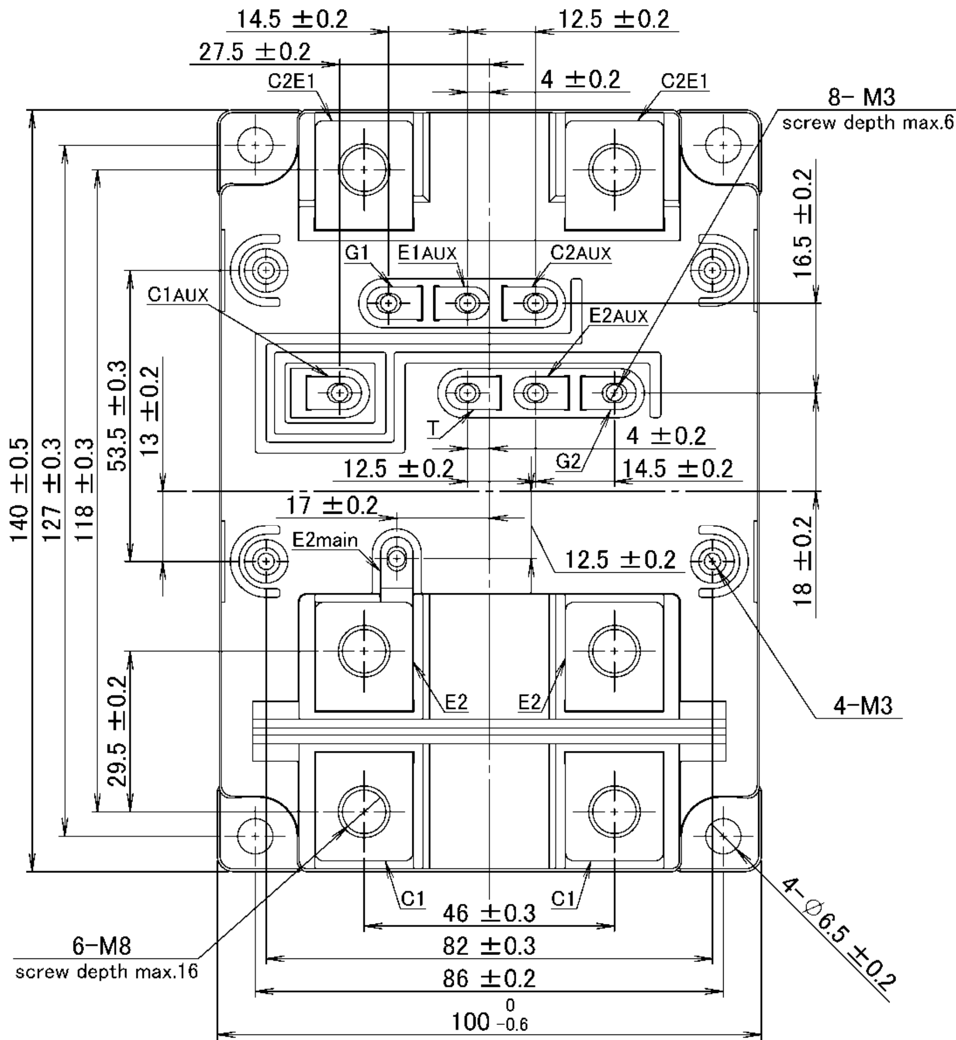
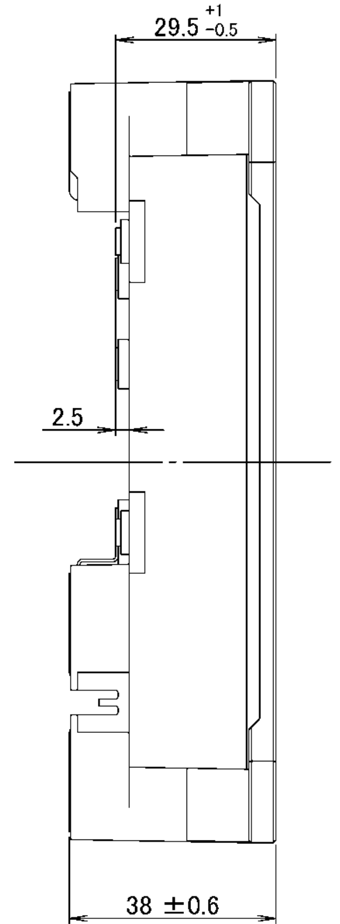
Target Specification

OUTLINE DRAWING

Unit in mm





Weight: 770(g)

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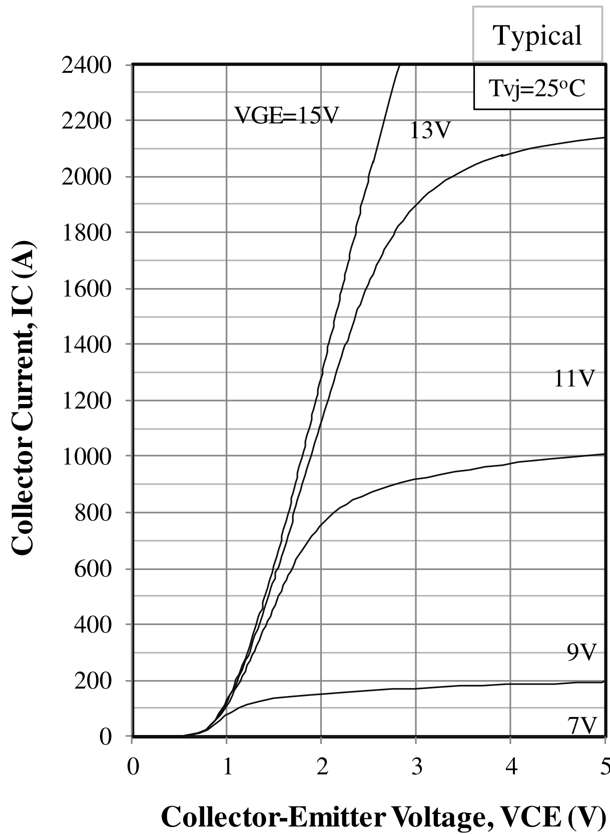
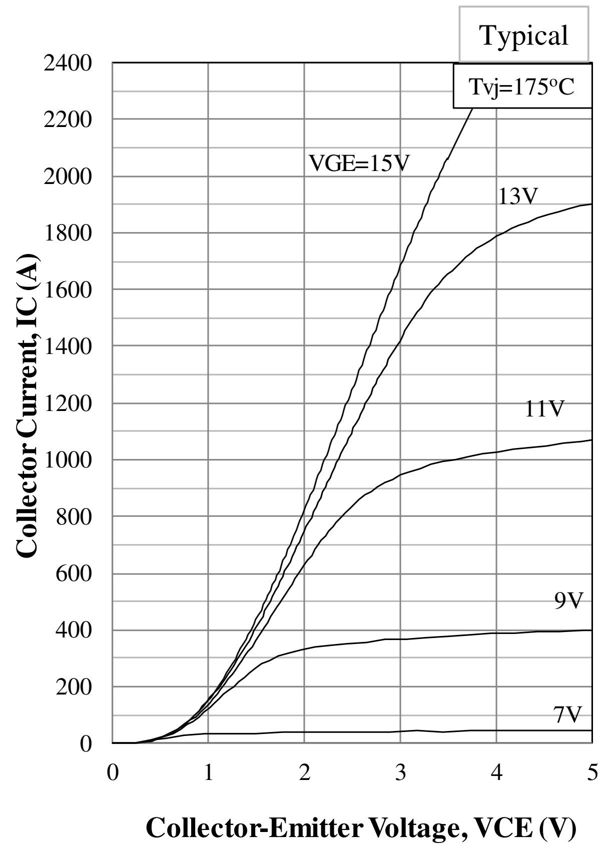
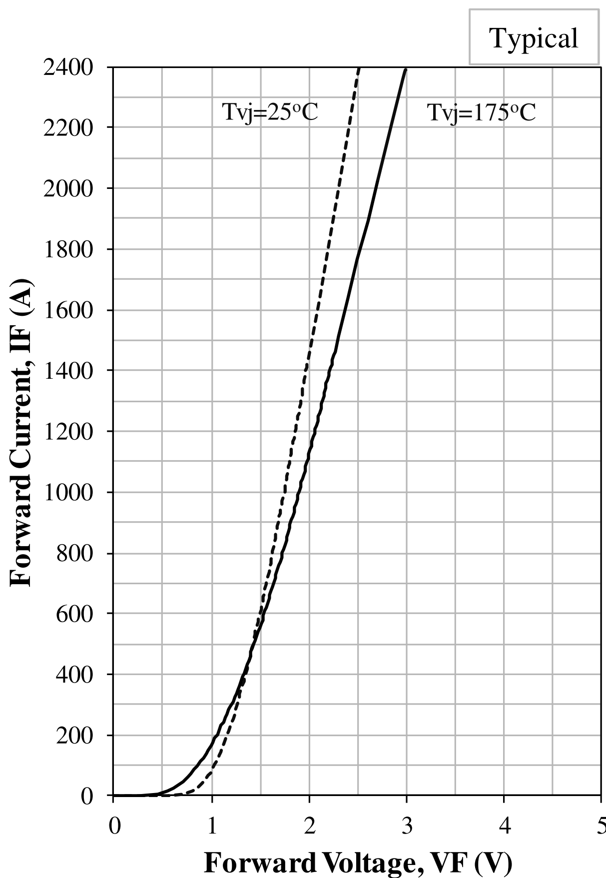
Target Specification



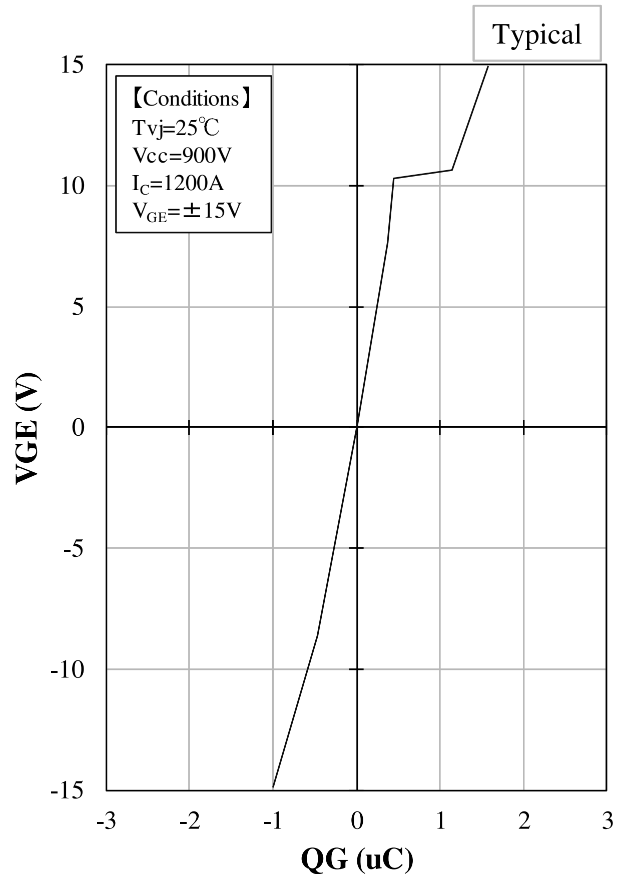


Collector Current vs. Collector to Emitter Voltage

Collector Current vs. Collector to Emitter Voltage



Forward Voltage of free-wheeling diode



QG - VGE curve

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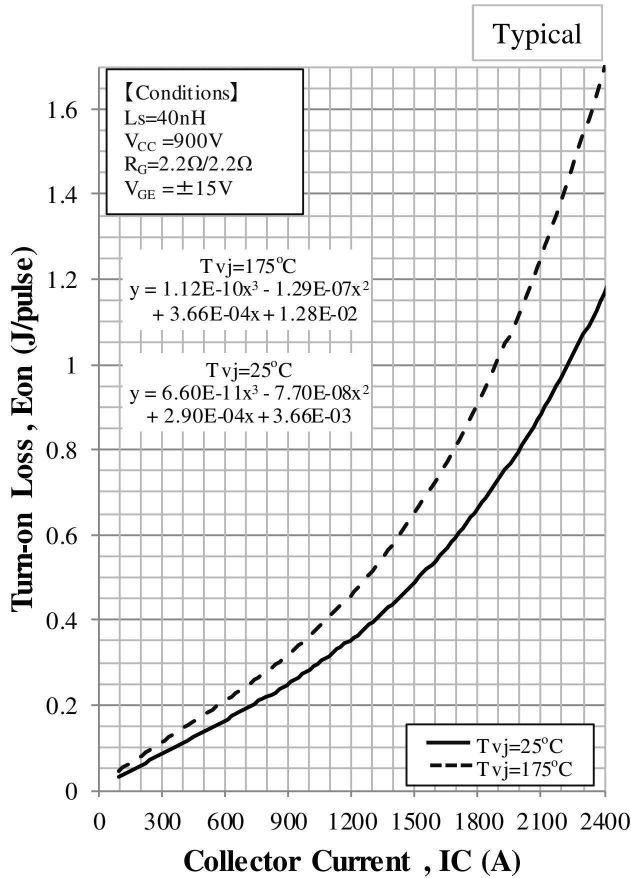
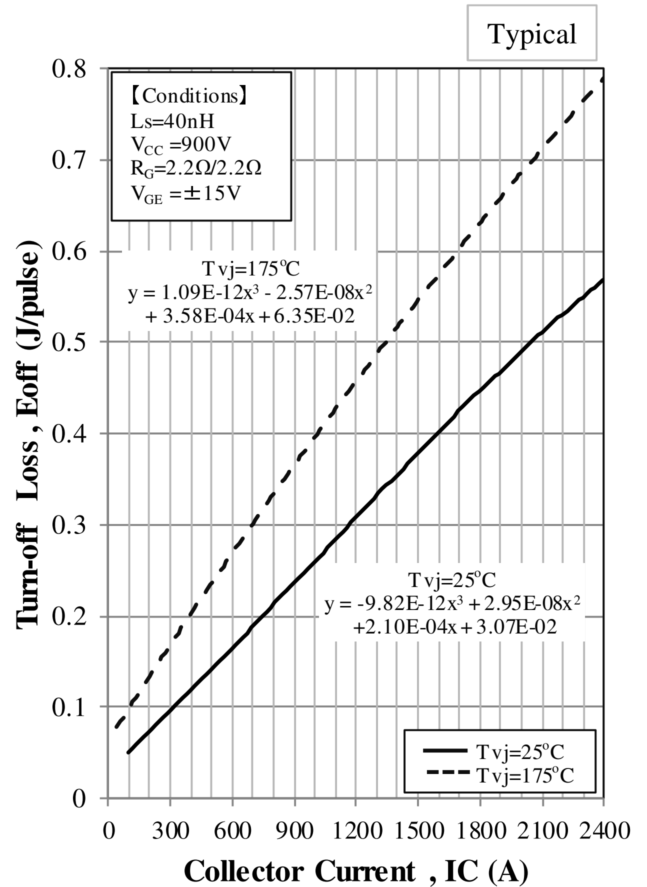
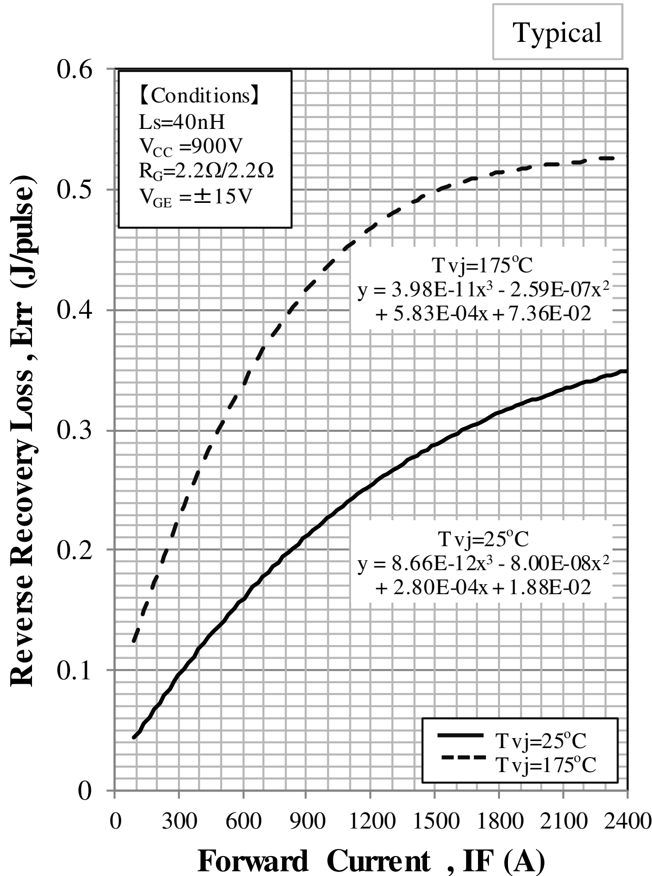
Target Specification



Turn-on Loss vs. Collector Current



Turn-off Loss vs. Collector Current



Recovery Loss vs. Forward Current

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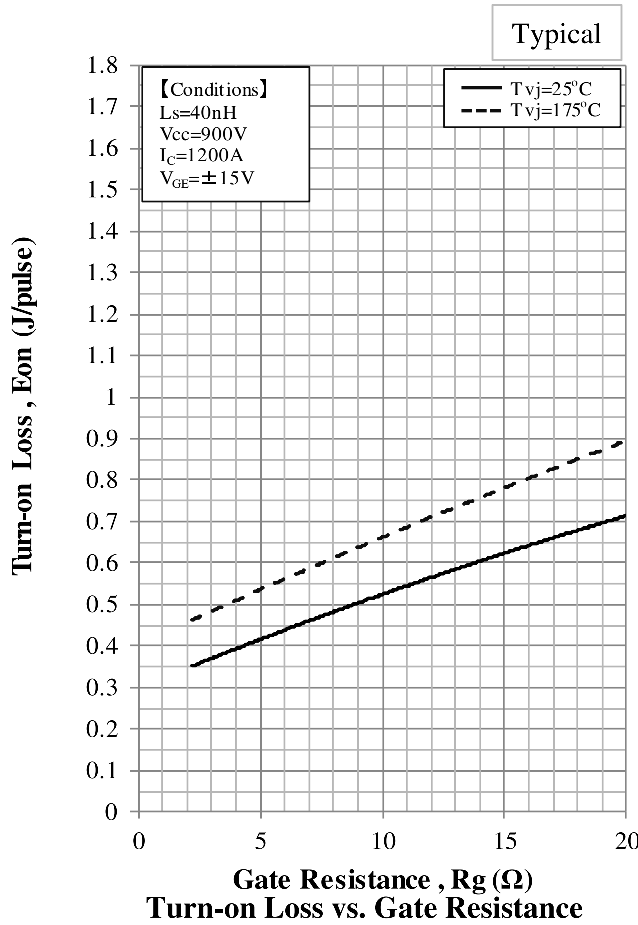
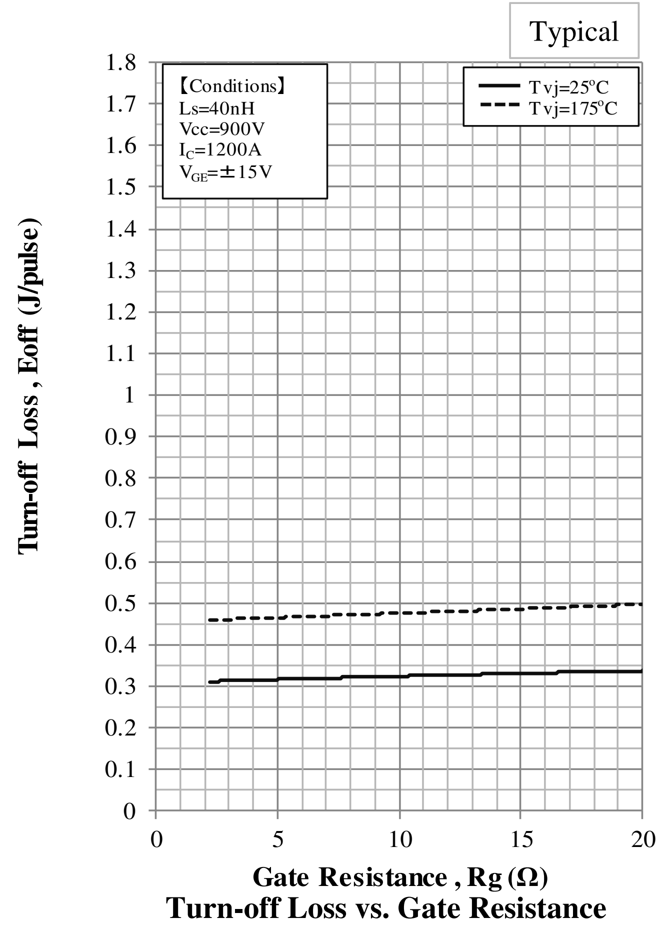
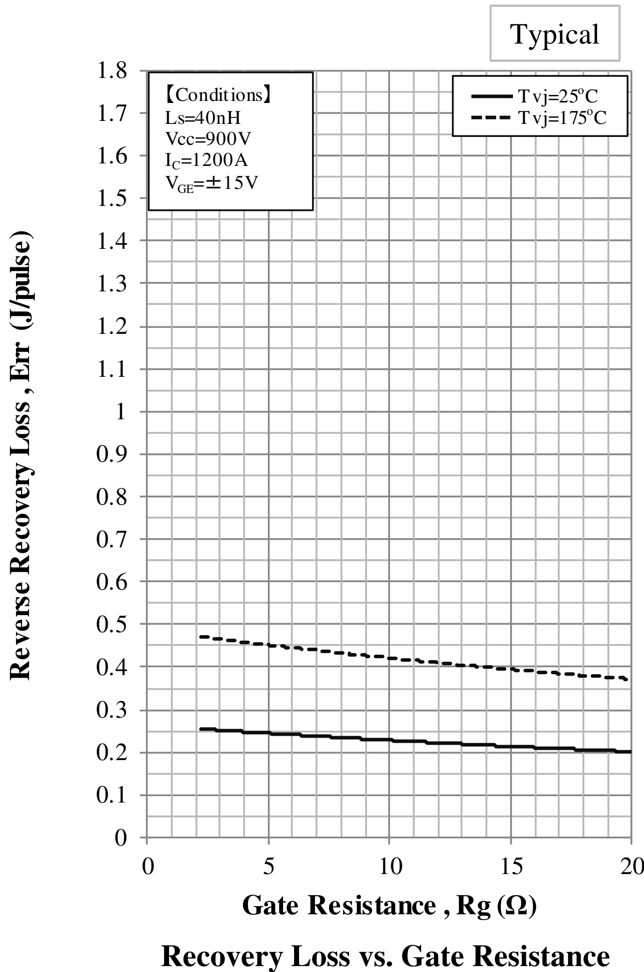
Target Specification



Turn-on Loss vs. Gate Resistance



Turn-off Loss vs. Gate Resistance



Recovery Loss vs. Gate Resistance

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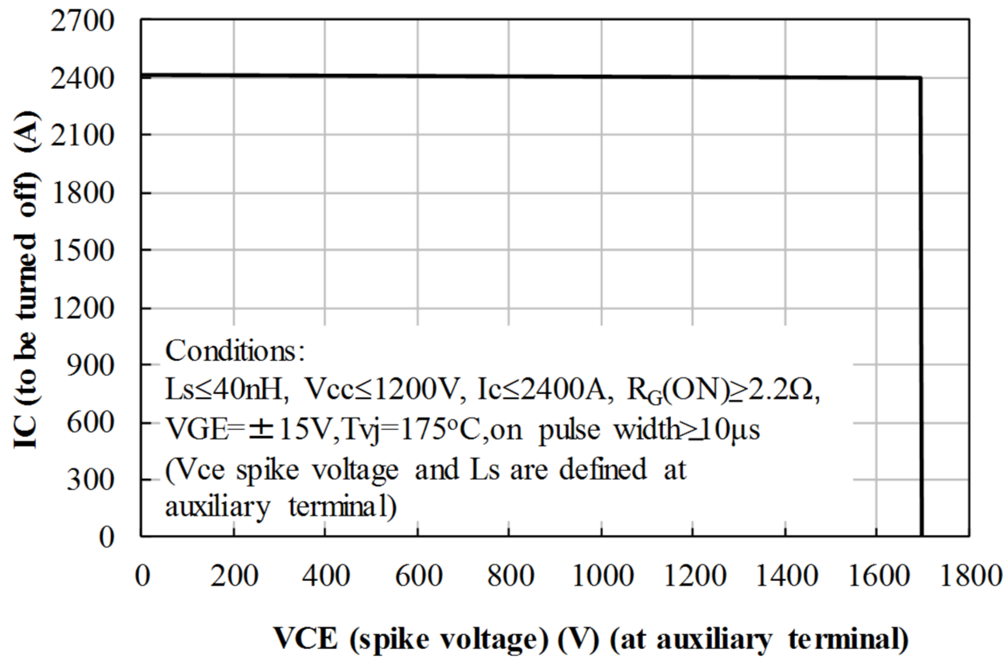
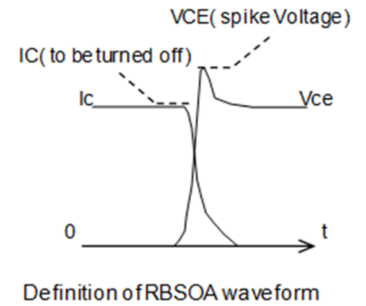
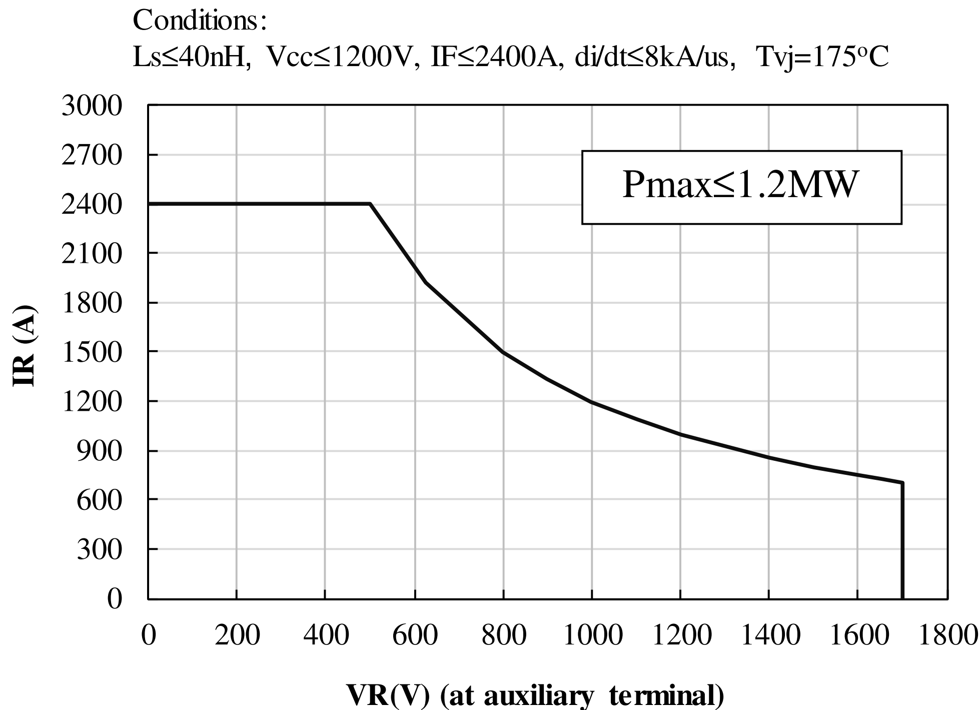
RBSOA

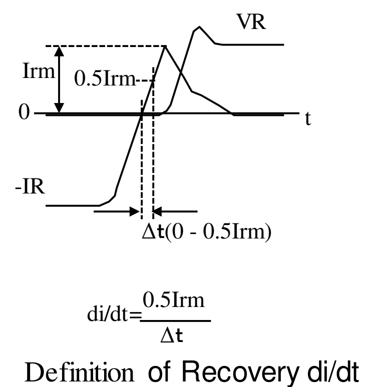




Reverse bias safe operation area (RBSOA)

Reverse Recovery SOA





Reverse Recovery SOA

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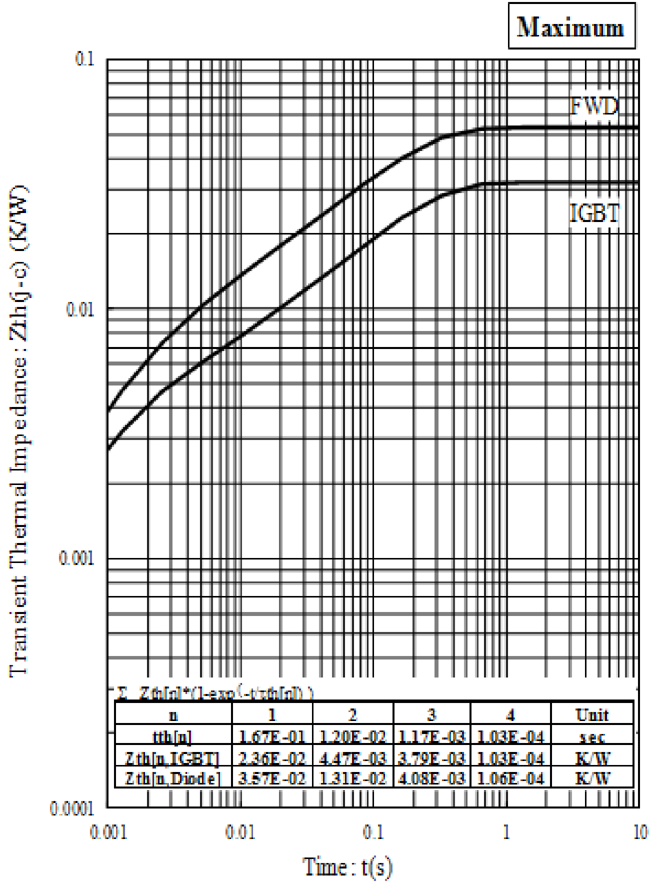
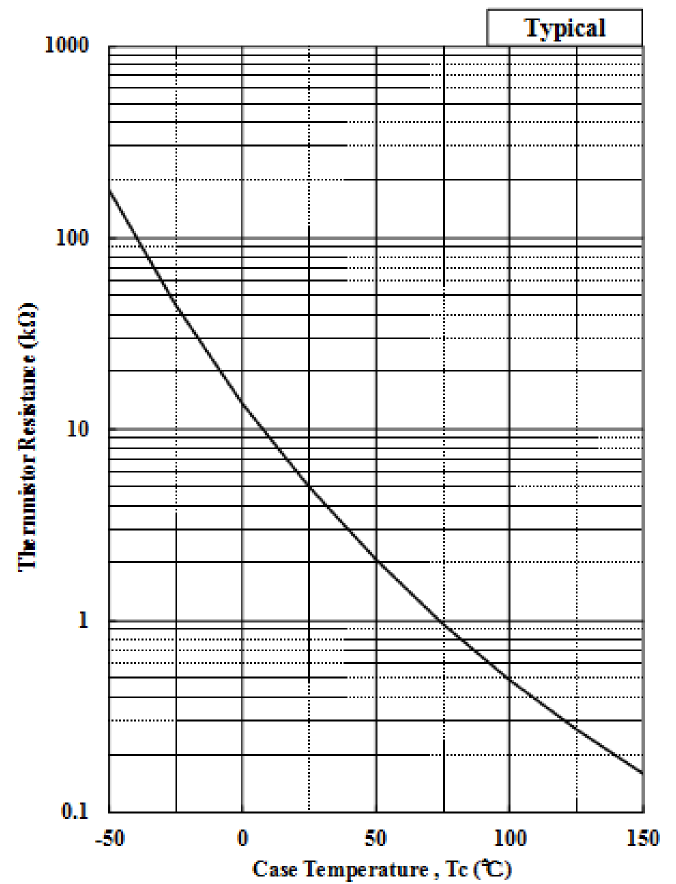
Target Specification

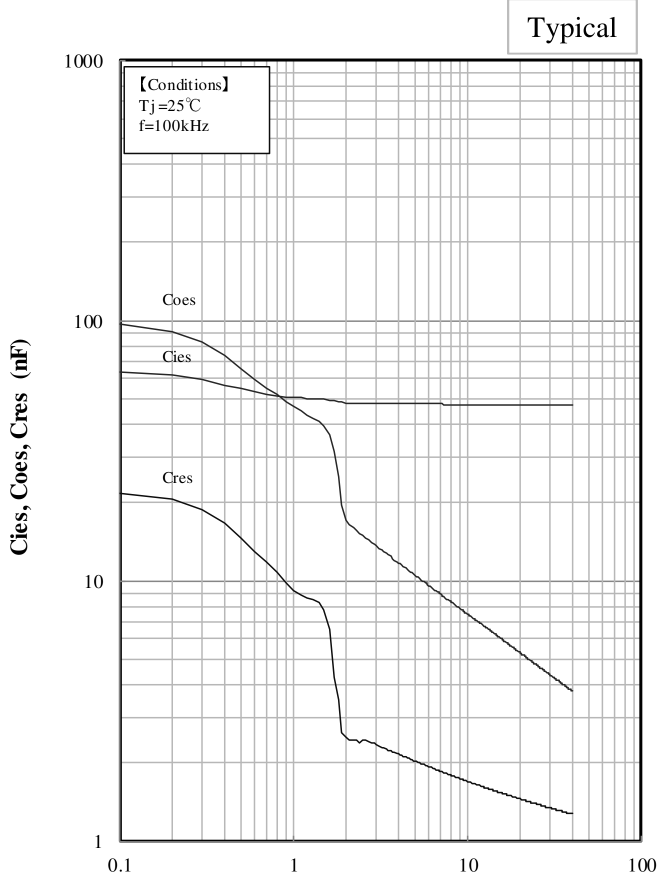


n	1	2	3	4	Unit
τth[n]	1.67E-01	1.20E-02	1.17E-03	1.03E-04	sec
Zth[n,IGBT]	2.36E-02	4.47E-03	3.79E-03	1.03E-04	K/W
Zth[n,Diode]	3.57E-02	1.31E-02	4.08E-03	1.06E-04	K/W

Transient Thermal Impedance Curve



Thermistor Resistornce vs. Temperature



Collector to Emitter Voltage,VCE (V)

Capacitance vs. Collector to Emitter Voltage

MBM1200GS17G2

Target Specification

HITACHI POWER SEMICONDUCTORS

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