

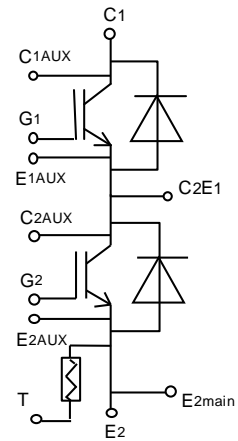
MBM450FS33F-C

Target Specification

Silicon N-channel IGBT 3300V F version with SiC Diode

FEATURES

- * Ultra low recovery loss with SiC diode
- * High current density package
- * Low stray inductance & low Rth(j-c)
- * Half-bridge (2in1)
- * Built in temperature sensor
- * Scalable large current easily handled by paralleling
- * Equipped with current sensing terminals



Circuit diagram

ABSOLUTE MAXIMUM RATINGS (T_C=25°C)

Item	Symbol	Unit	MBM450FS33F-C
Collector Emitter Voltage	V _{CEs}	V	3,300
Gate Emitter Voltage	V _{GES}	V	±20
Collector Current	DC	I _C	450
	1ms	I _{CM}	900
Forward Current	DC	I _F	450
	1ms	I _{FM}	900
Junction Temperature	T _{vi,op}	°C	-50 ~ +150
Storage Temperature	T _{stg}	°C	-55 ~ +150
Isolation Voltage	V _{ISO}	V _{RMS}	6,000(AC 1 minute)
Screw Torque	Terminals (M3/M8)	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	-	-	5	V _{CE} =3,300V, V _{GE} =0V, T _{vi} =25°C
			-	10	25	V _{CE} =3,300V, V _{GE} =0V, T _{vi} =150°C
Gate Emitter Leakage Current	I _{GES}	nA	-500	-	+500	V _{GE} =±20V, V _{CE} =0V, T _{vi} =25°C
Collector Emitter Saturation Voltage	V _{CEsat}	V	TBD	2.85	TBD	I _C =450A, V _{GE} =15V, T _{vi} =150°C
Gate Emitter Threshold Voltage	V _{GE(th)}	V	5.5	6.5	7.5	V _{CE} =10V, I _C =450mA, T _{vi} =25°C
Input Capacitance	C _{ies}	nF	-	TBD	-	V _{CE} =10V, V _{GE} =0V, f=100kHz, T _{vi} =25°C
Internal Gate Resistance	R _{g(int)}	Ω	-	TBD	-	V _{CE} =10V, V _{GE} =0V, f=100kHz, T _{vi} =25°C
Switching Times	Rise Time	t _r	-	TBD	-	V _{CC} =1800V, I _C =450A
	Turn On Time	t _{on}	-	TBD	-	L _s =40nH
	Fall Time	t _f	-	TBD	-	R _{G(on/off)} =TBD (2)
	Turn Off Time	t _{off}	-	TBD	-	V _{GE} =±15V, T _{vi} =150°C
Forward Voltage Drop	V _F	V	TBD	4.75	TBD	I _F =450A, V _{GE} =0V, T _{vi} =150°C
Reverse Recovery Time	t _{rr}	μs	-	TBD	-	V _{CC} =1800V, I _F =450A, L _s =40nH T _{vi} =150°C
Turn-on Loss per Pulse	E _{on}	J/P	-	0.36	-	V _{CC} =1800V, I _C =450A, L _s =40nH
Turn-off Loss per Pulse	E _{off}	J/P	-	0.57	-	R _{G(on/off)} =12Ω/12Ω (2)
Reverse Recovery Loss per Pulse	E _{rr}	J/P	-	0.01	-	V _{GE} =±15V, T _{vi} =150°C
Stray Inductance Module	L _{SCe}	nH	-	10	-	Between C1(main) and E2(main)
NTC-Thermistor	Resistance	R ₂₅	kΩ	-	5	-
	Deviation	ΔR/R	%	-5	-	5
Thermal Impedance	IGBT	R _{th(j-c)}	K/W	-	-	0.035
	FWD	R _{th(j-c)}	K/W	-	-	0.054
Contact Thermal Impedance	R _{th(c-f)}	K/W	-	0.02	-	Junction to case
						Case to fin (per 1 arm)

Notes: (2) R_G value is a test condition value for evaluation, not recommended value.

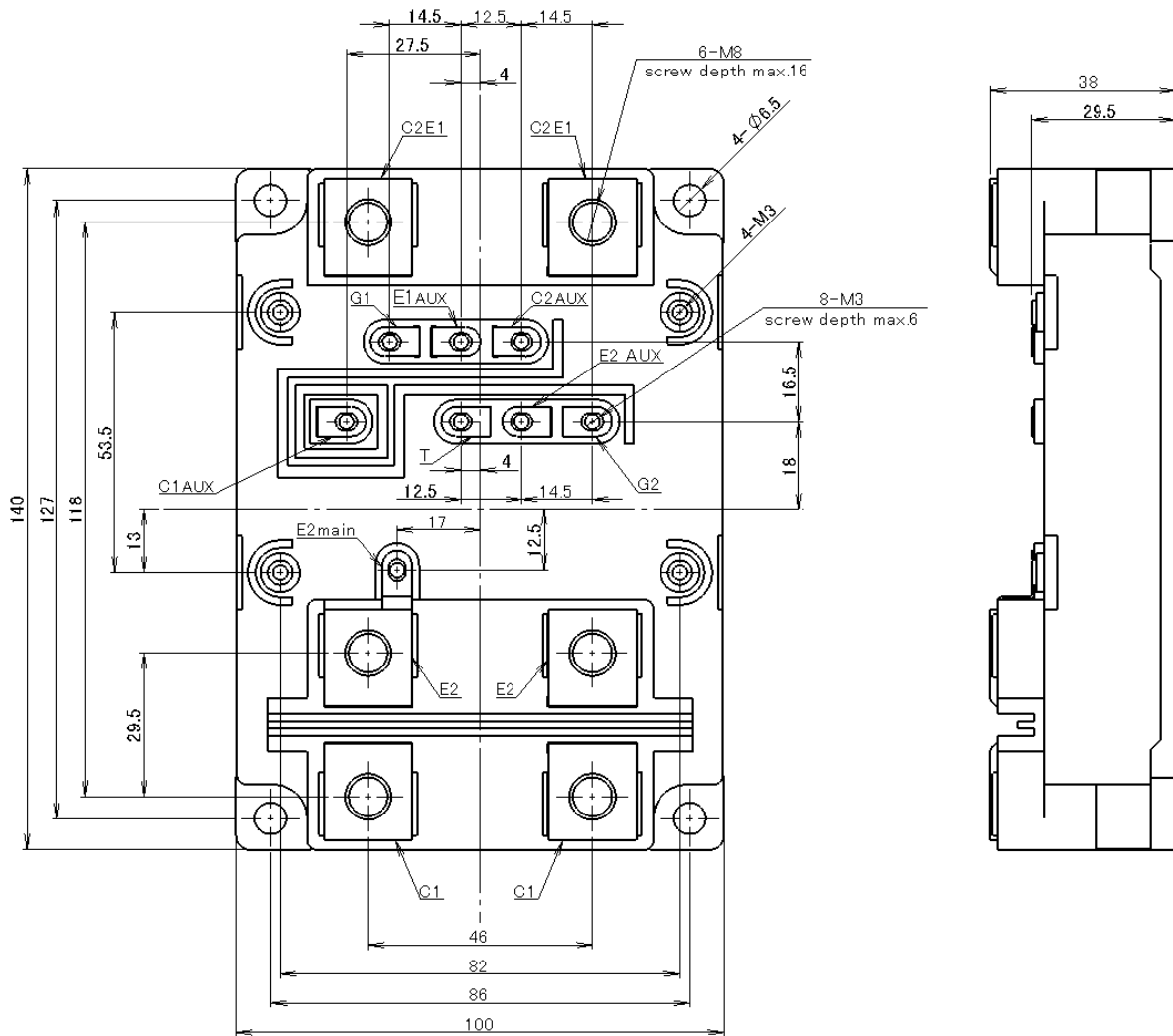
Please, determine the suitable R_G value by measuring switching behavior and checking results with the respective SOA.

- * 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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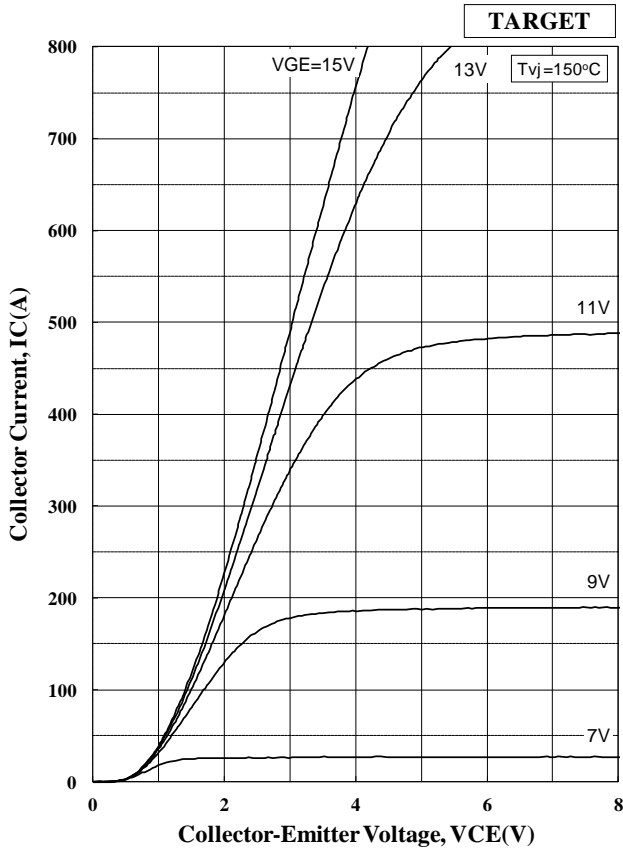
Target Specification

OUTLINE DRAWING

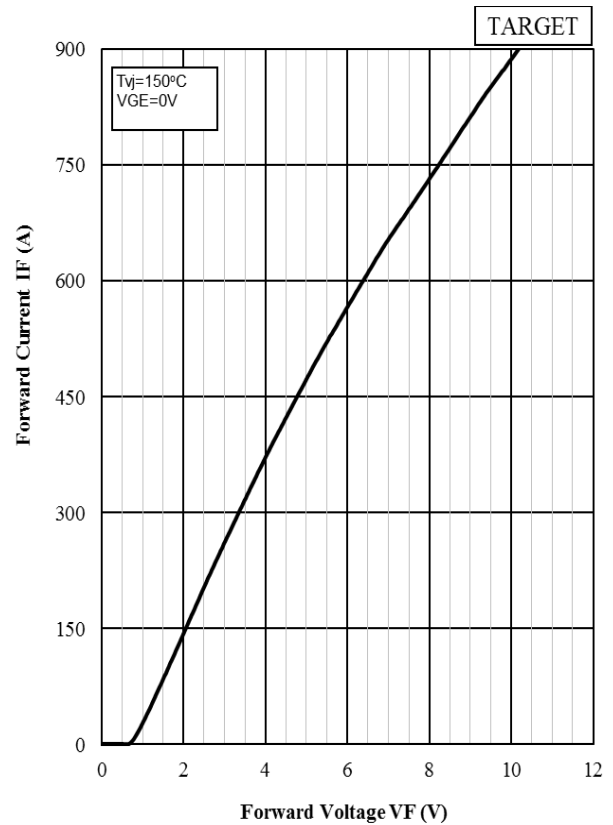


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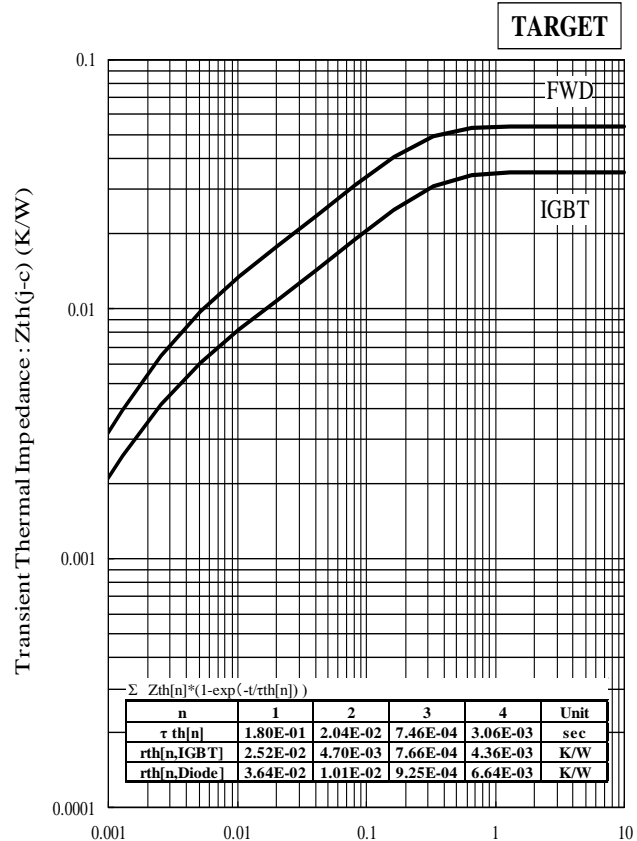
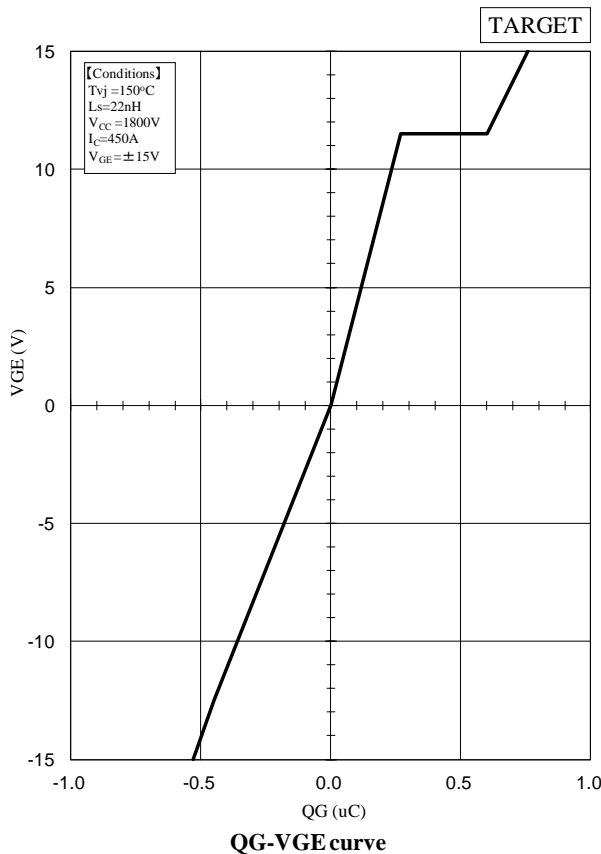
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Collector Current vs. Collector to Emitter Voltage



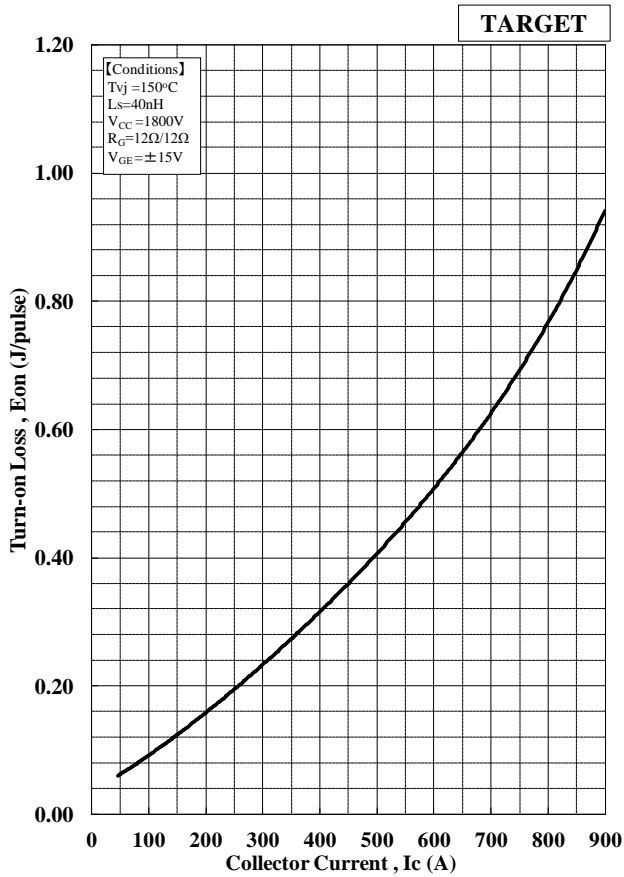
Forward voltage of free-wheeling diode



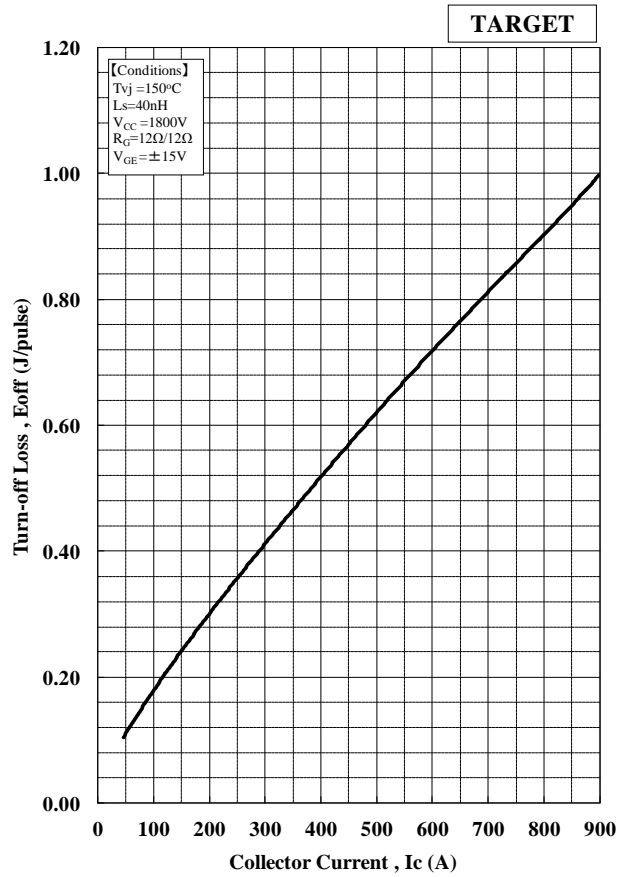
Transient Thermal Impedance Curve

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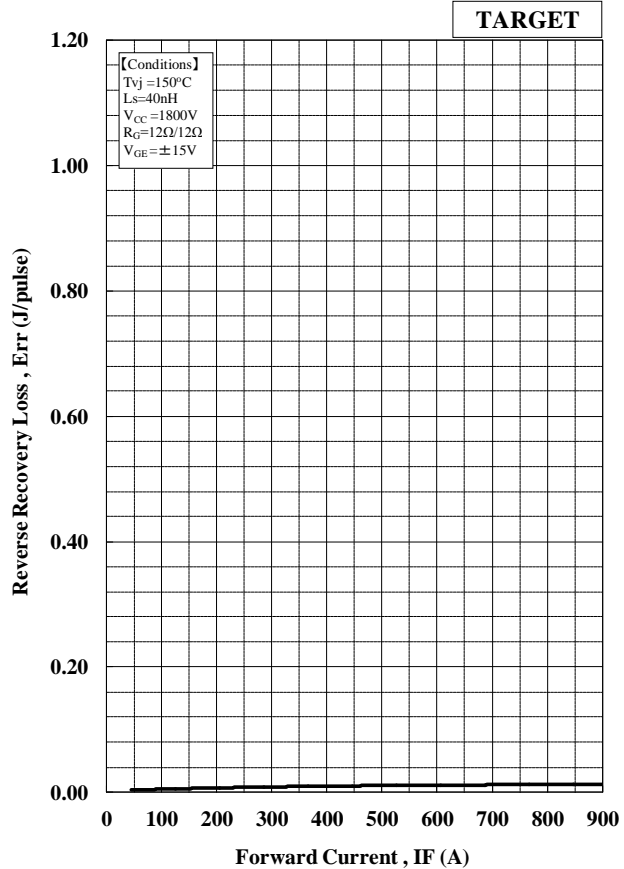
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Turn-on Loss vs. Collector Current



Turn-off Loss vs. Collector Current



Recovery Loss vs. Forward Current

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HITACHI POWER SEMICONDUCTORS

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