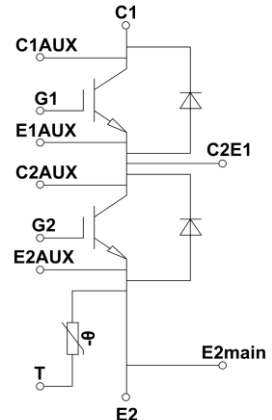


MBM450FS33F

Silicon N-channel IGBT 3300V F version

FEATURES

- * 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 (Tc=25°C)

Item	Symbol	Unit	MBM450FS33F
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 _{vj 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	-	-	0.30	V _{CE} =3,300V, V _{GE} =0V, T _{vj} =25°C	
			-	15	50	V _{CE} =3,300V, V _{GE} =0V, T _{vj} =150°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 _{CEsat}	V	-	2.25	-	I _C =450A, V _{GE} =15V, T _{vj} =25°C	
			2.50	3.05	3.50	I _C =450A, V _{GE} =15V, T _{vj} =150°C	
Gate Emitter Threshold Voltage	V _{GE(th)}	V	5.5	6.5	7.5	V _{CE} =10V, I _C =450mA, T _{vj} =25°C	
Input Capacitance	C _{ies}	nF	-	24	-	V _{CE} =10V, V _{GE} =0V, f=100kHz, T _{vj} =25°C	
Internal Gate Resistance	R _{G(int)}	Ω	-	6.2	-	V _{CE} =10V, V _{GE} =0V, f=100kHz, T _{vj} =25°C	
Turn On Delay Time	t _{d(on)}	μs	-	0.48	-	V _{CC} =1800V, I _C =450A	
Rise Time	t _r		-	0.12	-	L _s =40nH	
Turn Off Delay Time	t _{d(off)}		-	1.10	-	R _{G(on/off)} =6.8Ω/12Ω (2)	
Fall Time	t _f		-	1.30	-	V _{GE} =±15V, T _{vj} =150°C	
Forward Voltage Drop	V _F	V	-	2.25	-	I _F =450A, V _{GE} =0V, T _{vj} =25°C	
			2.10	2.45	2.80	I _F =450A, V _{GE} =0V, T _{vj} =150°C	
Reverse Recovery Time	t _{rr}	μs	-	1.10	-	V _{CC} =1800V, I _F =450A, L _s =40nH T _{vj} =150°C	
Turn-on Loss per Pulse	E _{on}	J/P	-	0.73	-	V _{CC} =1800V, I _C =450A, L _s =40nH	
Turn-off Loss per Pulse	E _{off}	J/P	-	0.63	-	R _{G(on/off)} =6.8Ω/12Ω (2)	
Reverse Recovery Loss per Pulse	E _{rr}	J/P	-	0.68	-	V _{GE} =±15V, T _{vj} =150°C	
Short Circuit Pulse Width	t _{sc}	μs	10	-	-	V _{CC} =2200V, L _s =40nH R _{G(on/off)} =6.8/68Ω, V _{GE} =±15V, T _{vj} =150°C	
Stray Inductance Module	L _{SCE}	nH	-	9	-	Between C1(main) and E2(main)	
NTC-Thermistor	Resistance	R ₂₅	kΩ	-	5	-	T _C =25 °C
	Deviation	ΔR/R	%	-5	-	5	T _C =25 °C
	B-constant	B _(25/50)	K	-	3375	-	Between 25°C and 50°C
Thermal Impedance	IGBT	Rth(j-c)	K/W	-	-	0.035	Junction to case
	FWD	Rth(j-c)	K/W	-	-	0.055	Junction to case
Contact Thermal Impedance	Rth(c-f)	K/W	-	0.02	-	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.

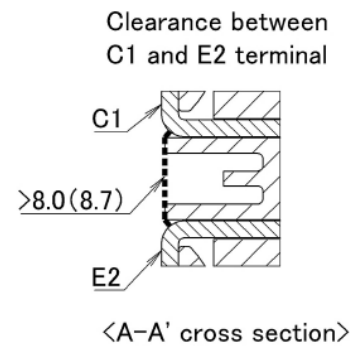
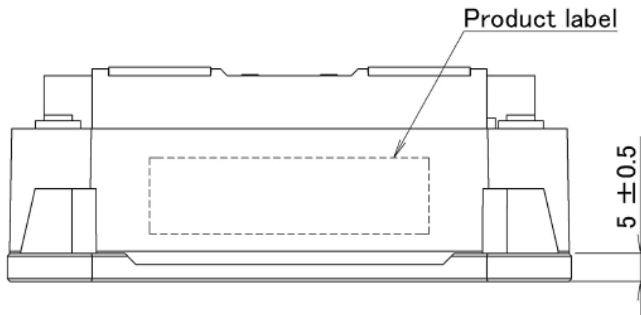
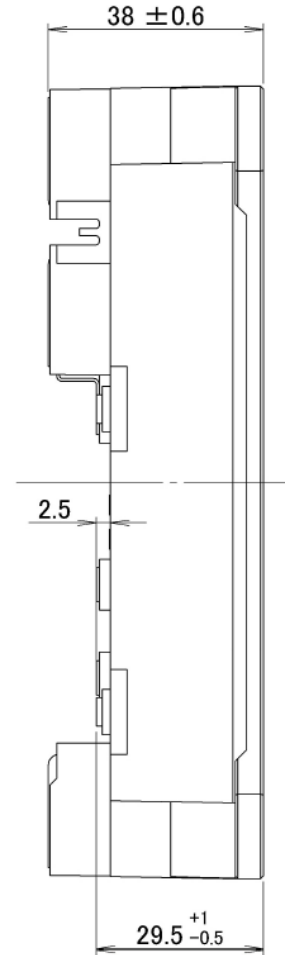
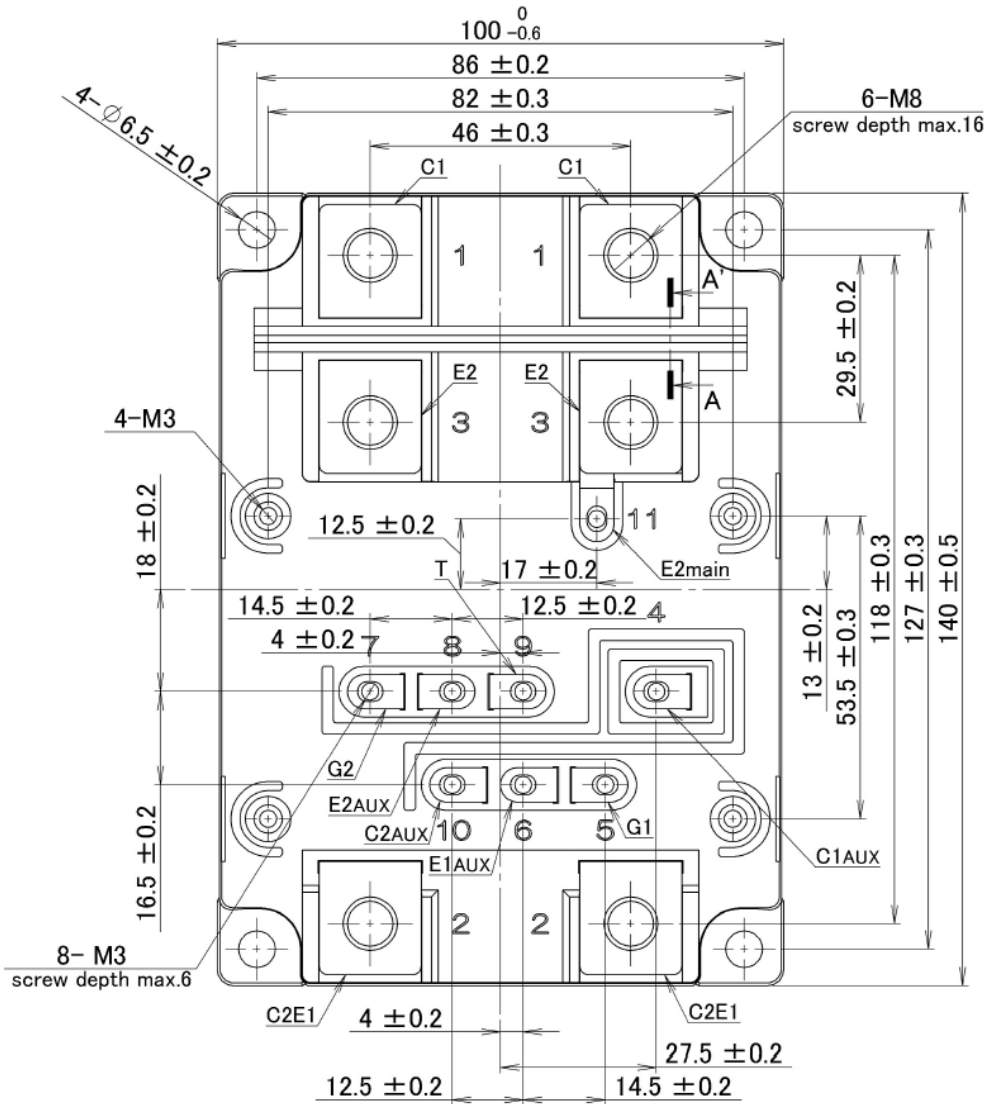
* For actual application, please confirm this spec sheet is the newest revision.

* ELECTRICAL CHARACTERISTIC items shown in above table are according to IEC 60747-2 and IEC 60747-9.

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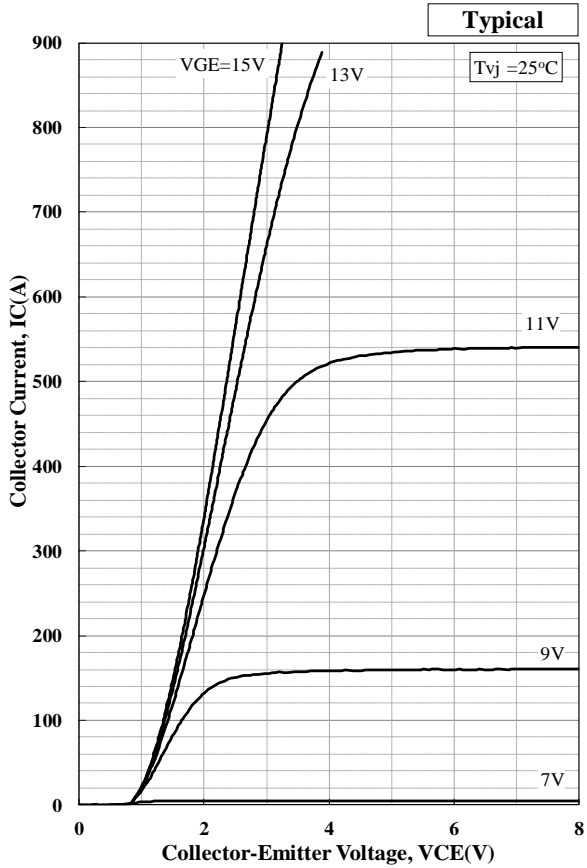
OUTLINE DRAWING

Unit in mm

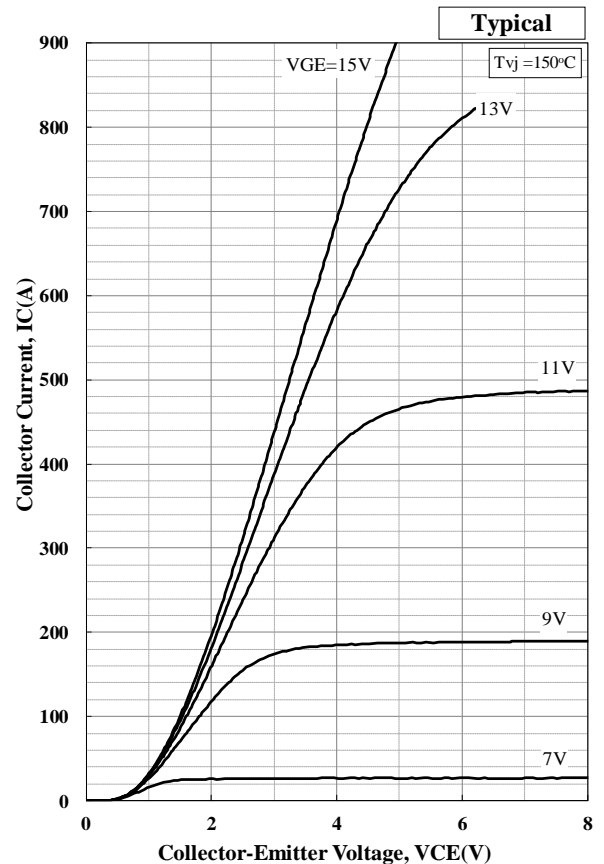


Weight: 770(g)

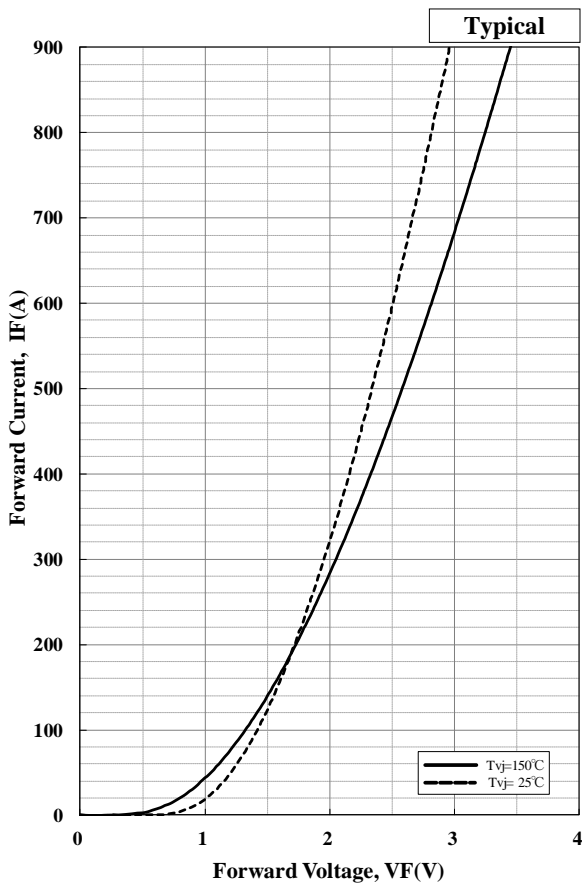
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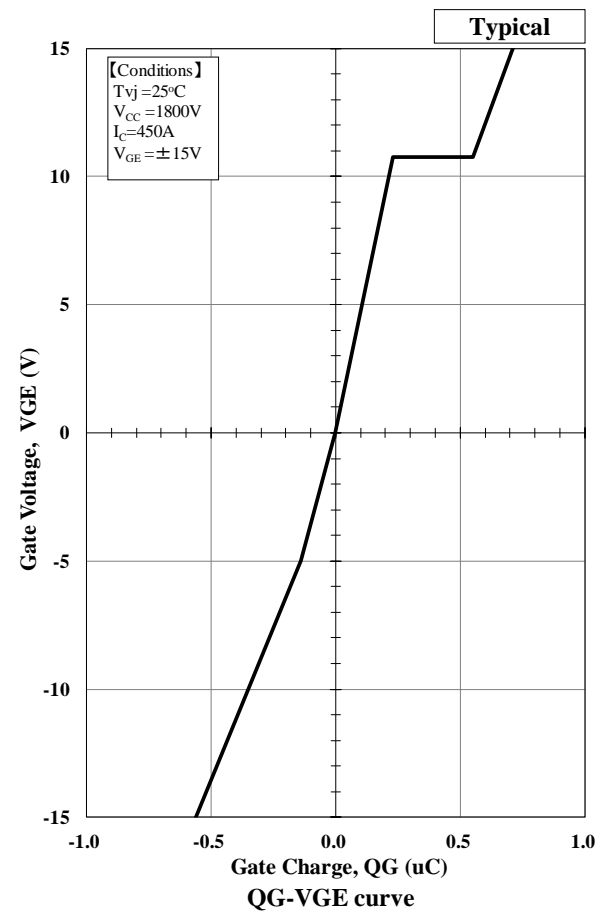
Collector Current vs. Collector to Emitter Voltage



Collector Current vs. Collector to Emitter Voltage

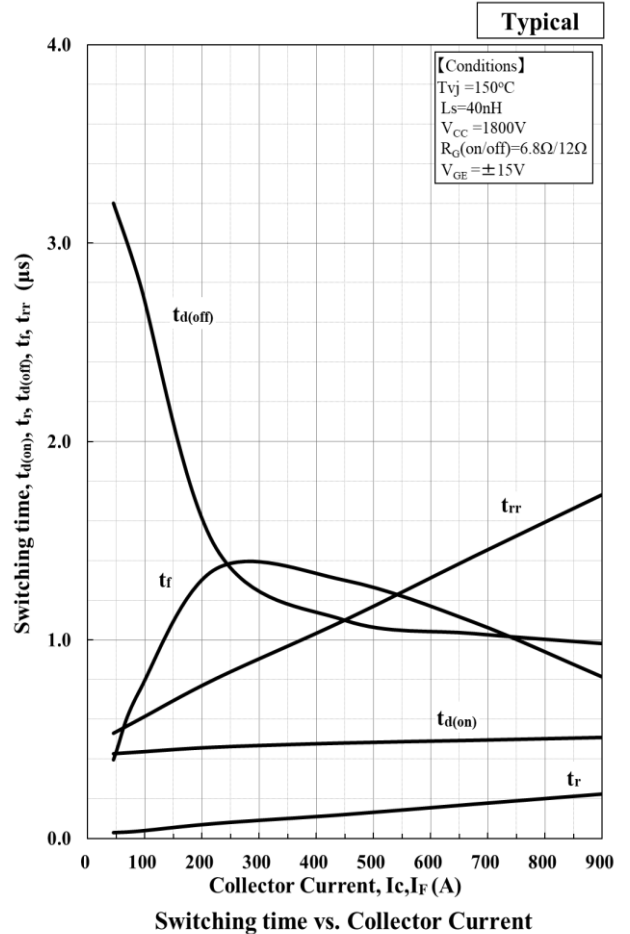
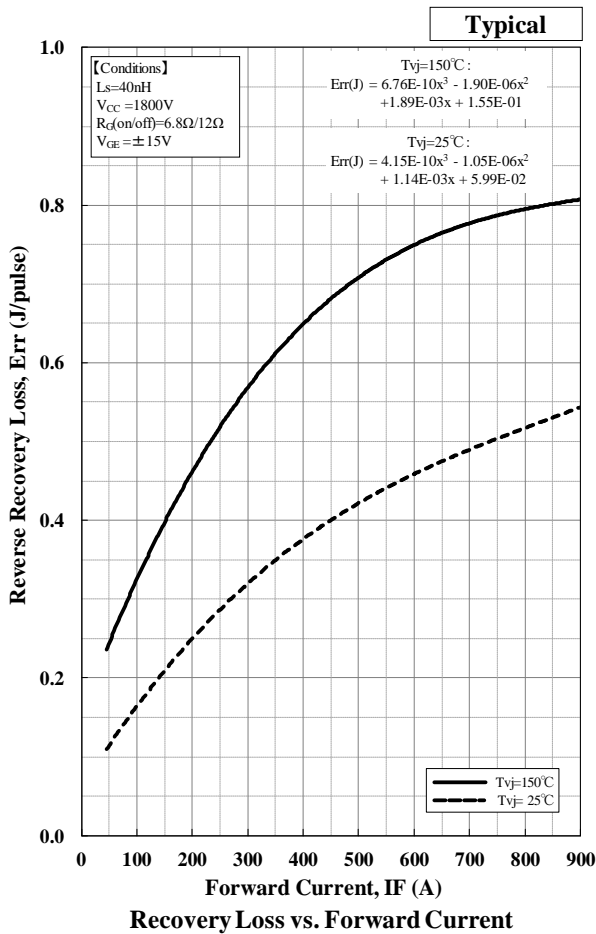
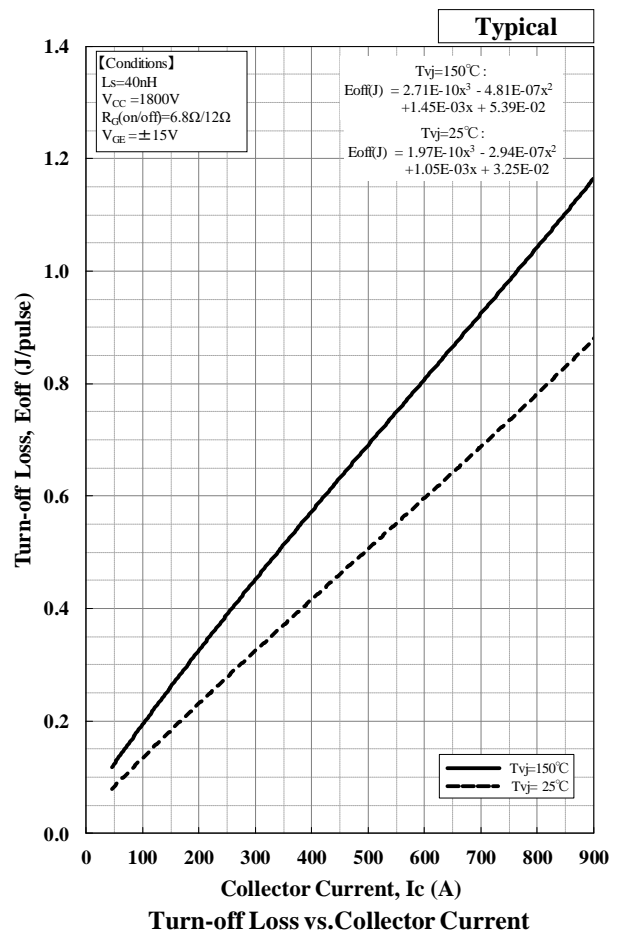
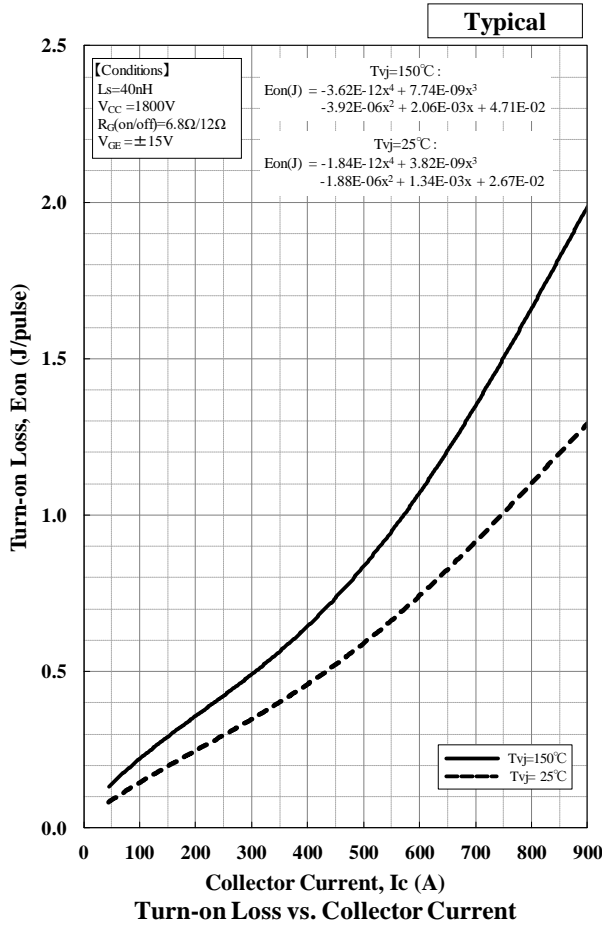


Forward Voltage of free-wheeling diode

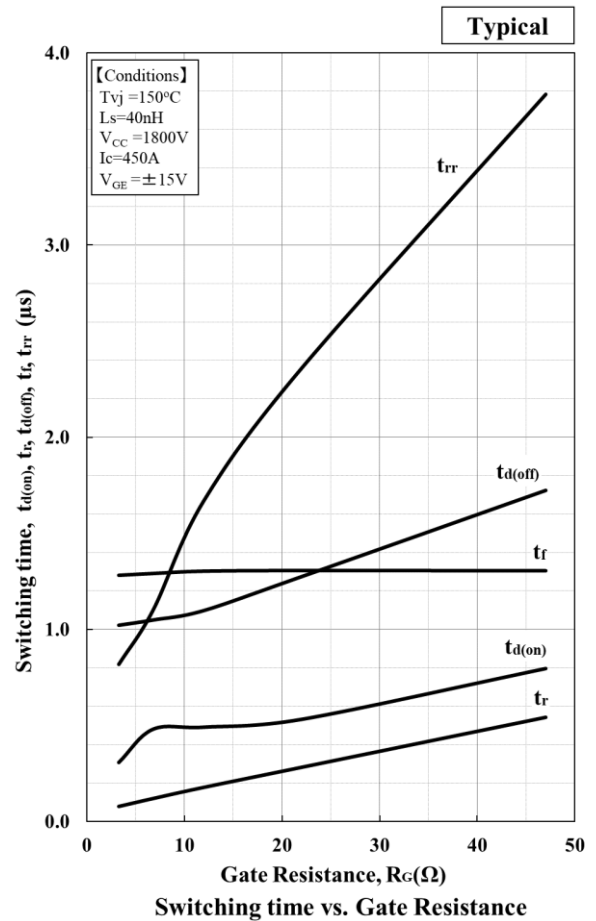
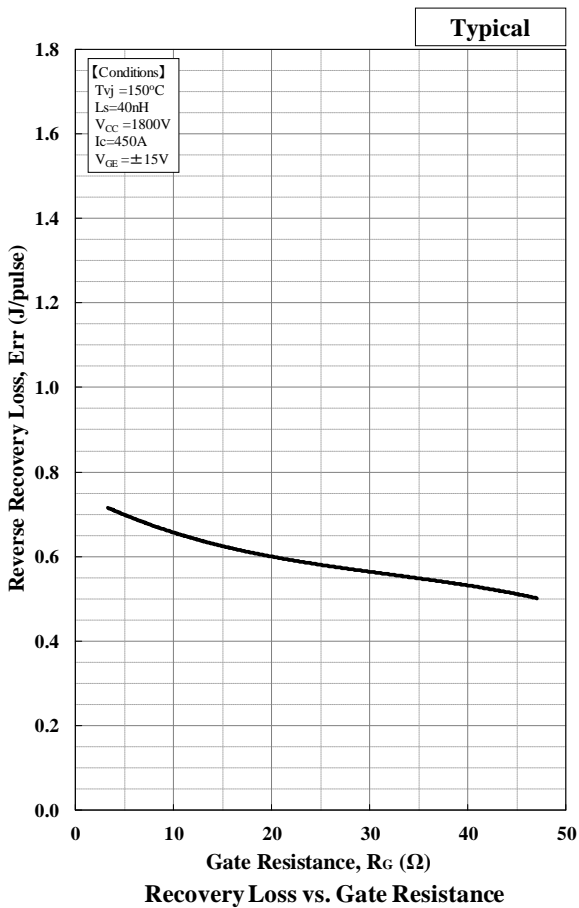
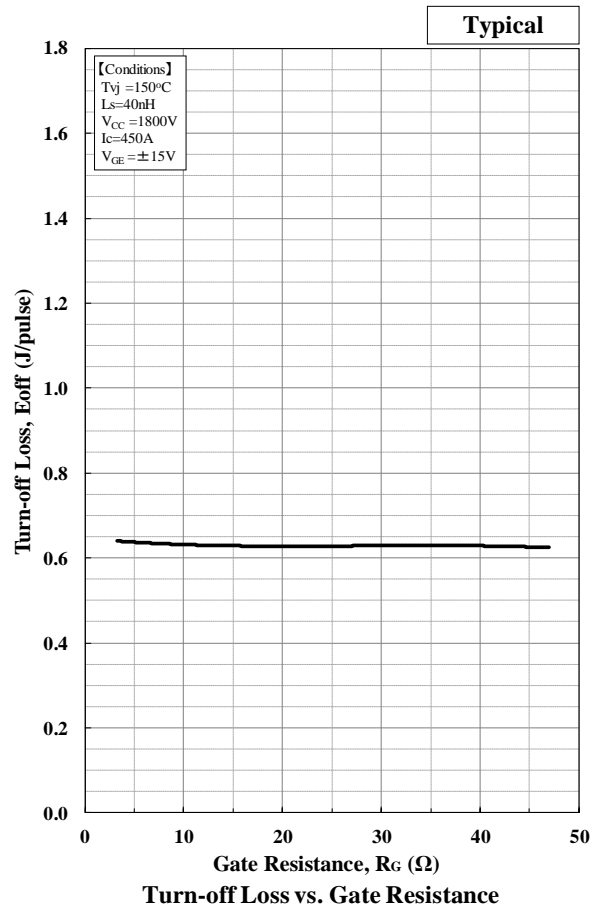
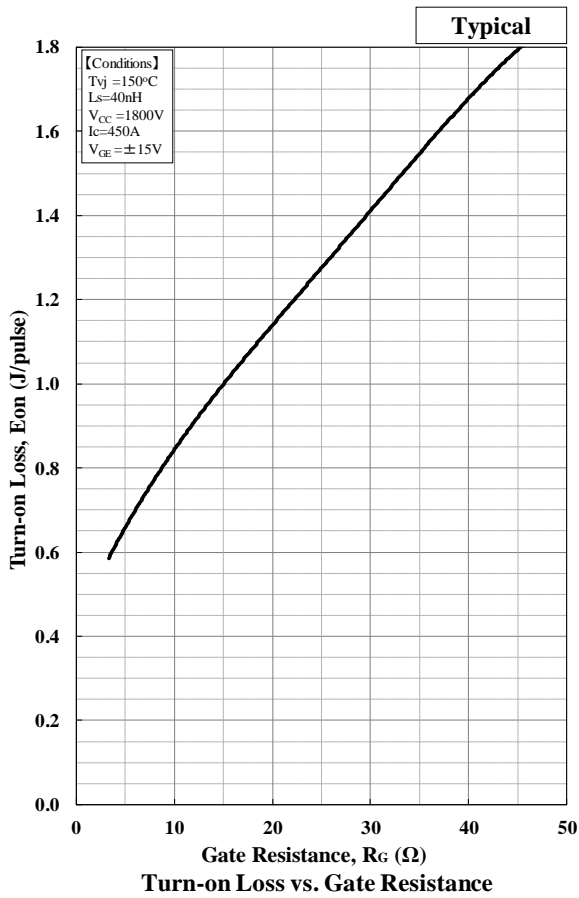


QG-VGE curve

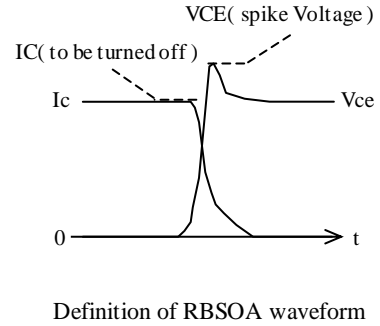
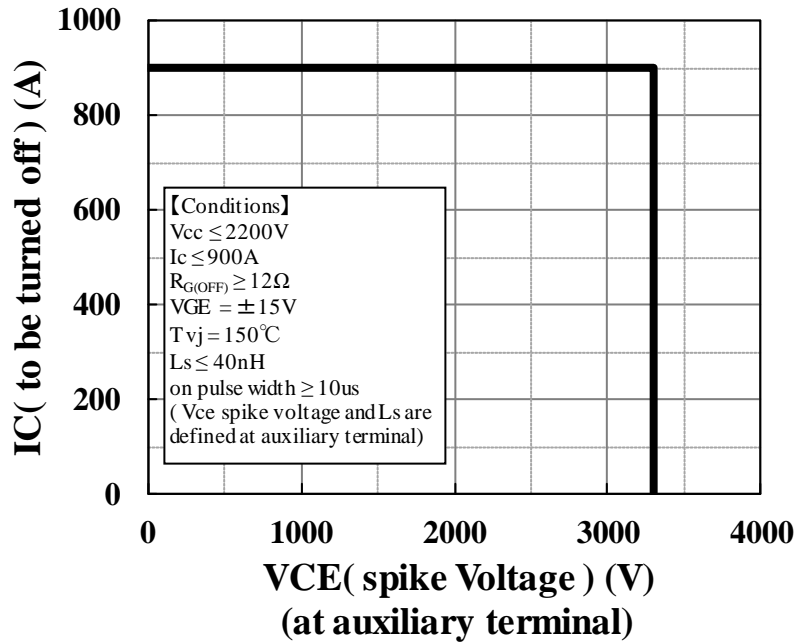
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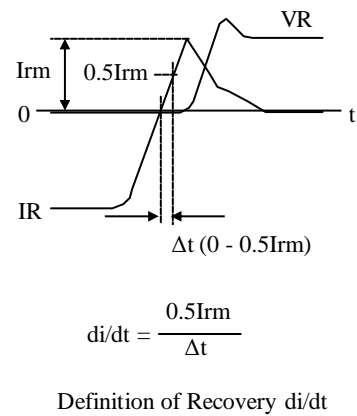
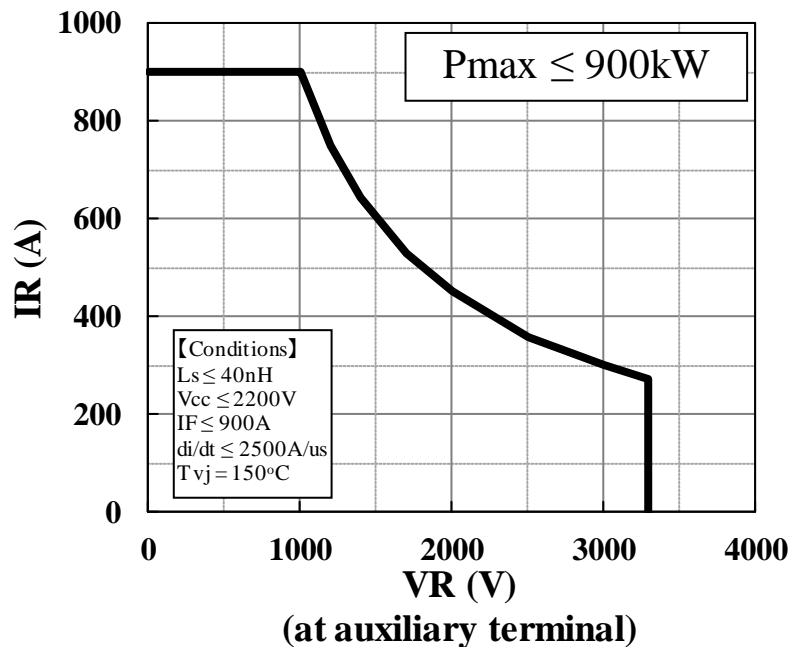
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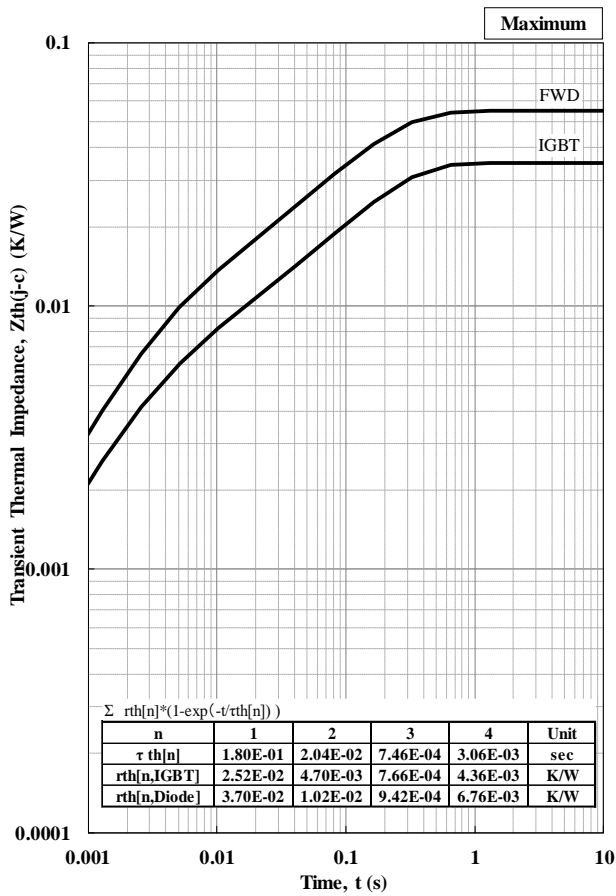


Reverse bias safe operation area (RBSOA)

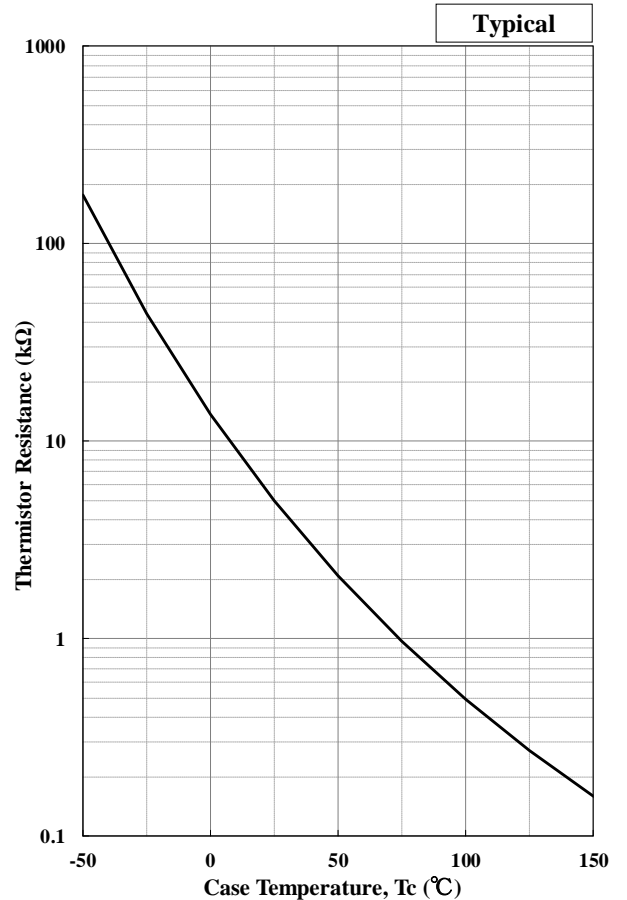


Reverse Recovery SOA

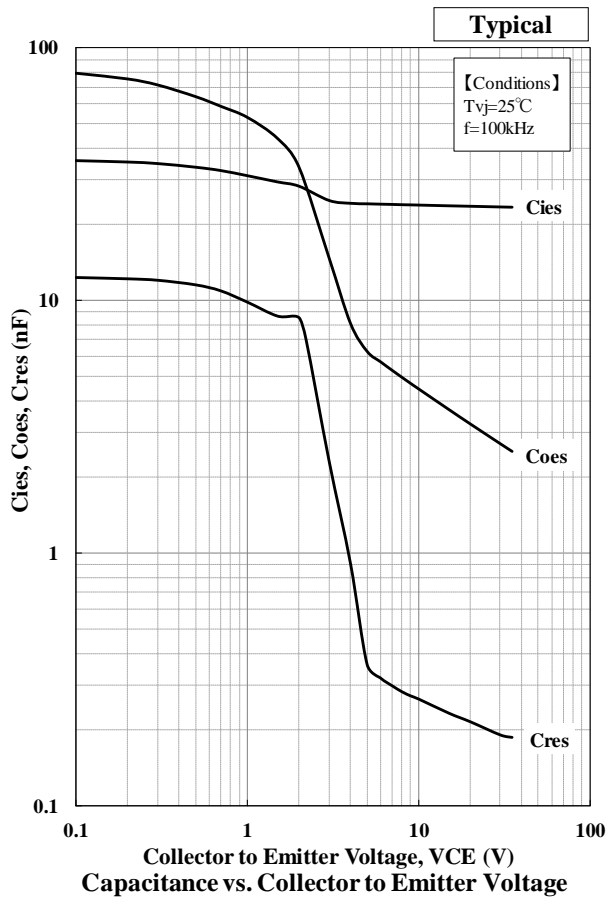
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Transient Thermal Impedance Curve



Thermistor Resistance vs. Temperature



Capacitance vs. Collector to Emitter Voltage

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