MBN600H65E

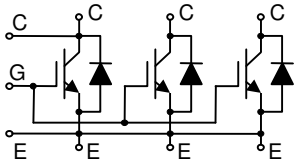
PRELIMINARY SPECIFICATION

Silicon N-channel IGBT

FEATURES

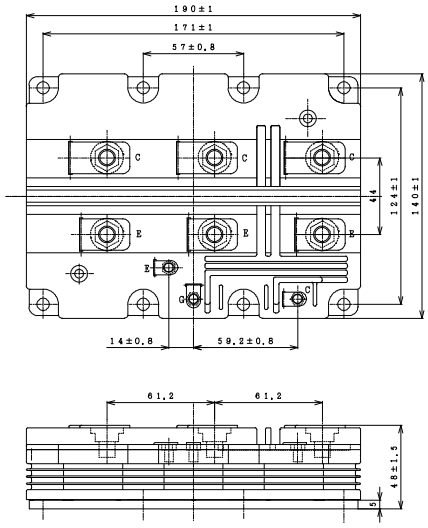
* Soft switching behavior & low conduction loss:
  Soft low-injection punch-through High conductivity IGBT.
* Low driving power due to low input capacitance MOS gate.
* Low noise recovery: Ultra soft fast recovery diode
* High reverse recovery capability:
  Diode has a Super HiRC structure.
* High reliability, high durability module.
* High thermal fatigue durability.
  (delta Tc=70K, N>30,000cycles)
* AlSiC base-plate/AlN substrate

CIRCUIT DIAGRAM



TERMINALS

OUTLINE DRAWING Unit in mm



Weight: 1550(g)

ABSOLUTE MAXIMUM RATINGS (Tc=25°C)

Item		Symbol	Unit	MBN600H65E
Collector Emitter Voltage		V_{CES}	V	6,500
Gate Emitter Voltage		V_{GES}	V	±20
Collector Current	DC	I_C	A	600
	1ms	I_{Cp}		1,200
Forward Current	DC	I_F	A	600
	1ms	I_{FM}		1,200
Junction Temperature		T_j	°C	-40 ~ +125
Storage Temperature		T_{stg}	°C	-40 ~ +125
Isolation Voltage		V_{ISO}	V_{RMS}	10,200 (AC 1 minute)
Screw Torque	Terminals (M4/M8)	-	N·m	2 / 10 (1)
	Mounting (M6)	-		6 (2)

Notes: (1) Recommended Value 1.8±0.2/9±1N·m (2) 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	-	-	12	V_{CE}=6,500V, V_{GE}=0V, Tj=25°C
				-	60	-	V_{CE}=6,500V, V_{GE}=0V, Tj=125°C
Gate Emitter Leakage Current		I_{GES}	nA	-500	-	+500	V_{GE}=±20V, V_{CE}=0V, Tj=25°C
Collector Emitter Saturation Voltage		$V_{CE(sat)}$	V	-	5.7	-	I_C=600A, V_{GE}=15V, Tj=125°C
Gate Emitter Threshold Voltage		$V_{GE(TO)}$	V	4.5	6.0	7.5	V_{CE}=10V, I_C=600mA, Tj=25°C
Input Capacitance		C_{ies}	nF	-	90	-	V_{CE}=10V,V_{GE}=0V, f=100kHz, Tj=25°C
Internal Gate Resistance		Rge	Ω	-	0.4	-	V_{CE}=10V,V_{GE}=0V, f=100kHz, Tj=25°C
Switching Times	Rise Time	t_r	µs	-	3.0	-	V_{CC}=3,600V, Ic=600A
	Turn On Time	t_{on}		-	3.7	-	L=200nH
	Fall Time	t_f		-	4.1	-	R_G=10Ω (3)
	Turn Off Time	t_{off}		-	7.2	-	V_{GE}=±15V, Tj=125°C
Peak Forward Voltage Drop		V_{FM}	V	-	4.5	-	Ic=600A, V_{GE}=0V, Tj=125°C
Reverse Recovery Time		t_{rr}	µs	-	0.8	-	Vcc=3600V, Ic=600A, L=200nH Tj=125°C
Turn On Loss		$E_{on(10\%)}$	J/P		3.6	-	V_{CC}=3600V, Ic=600A, L=200nH
Turn Off Loss		$E_{off(10\%)}$	J/P		2.9	-	R_G=10Ω (3)
Reverse Recovery Loss		$E_{rr(10\%)}$	J/P		2.0	-	V_{GE}=±15V, Tj=125°C
Partial discharge extinction voltage		Vex	V_{RMS}	5,100	-	-	f=50Hz, Q_{PD}=10pC
Thermal Impedance	IGBT	Rth(j-c)	K/W	-	-	0.009	Junction to case
	FWD	Rth(j-c)		-	-	0.018	
Contact Thermal Impedance		Rth(c-f)	K/W	-	0.006	-	Case to fin

Notes:(3) R_G value is the test condition's value for evaluation of the switching times, not recommended value. Please, determine the suitable R_G value after the measurement of switching waveforms (overshoot voltage, etc.) with appliance mounted.

* 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.

STATIC CHARACTERISTICS

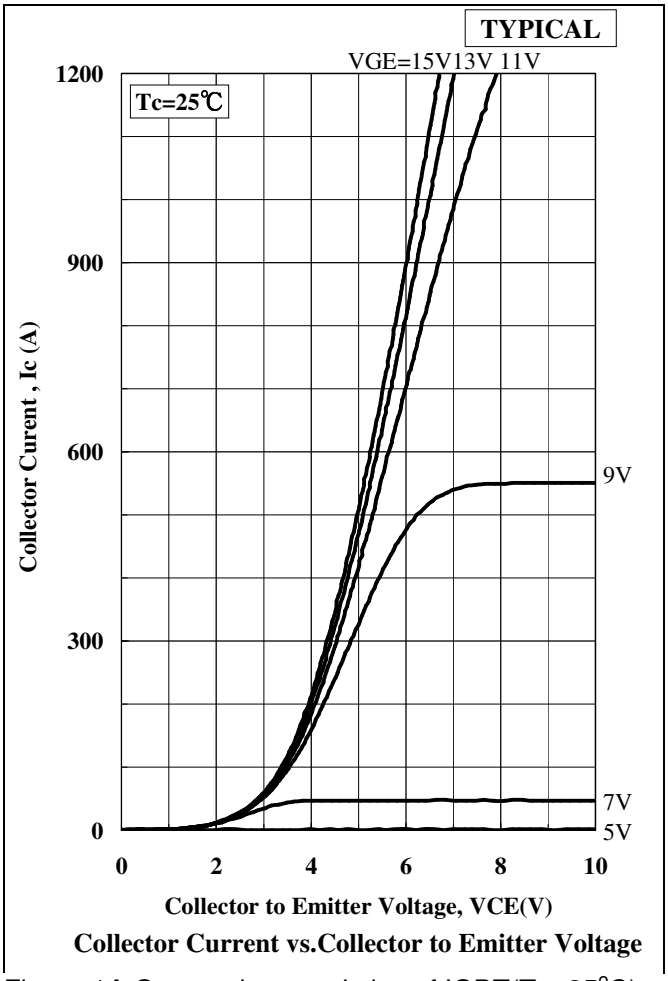


Figure 1A Output characteristics of IGBT(Tc=25°C)

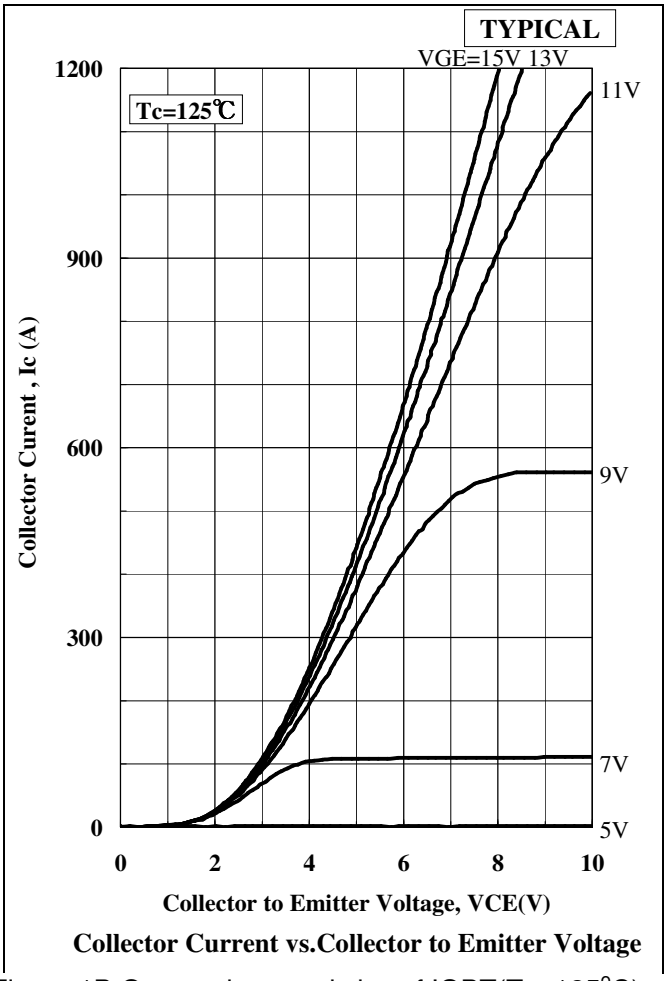


Figure 1B Output characteristics of IGBT(Tc=125°C)

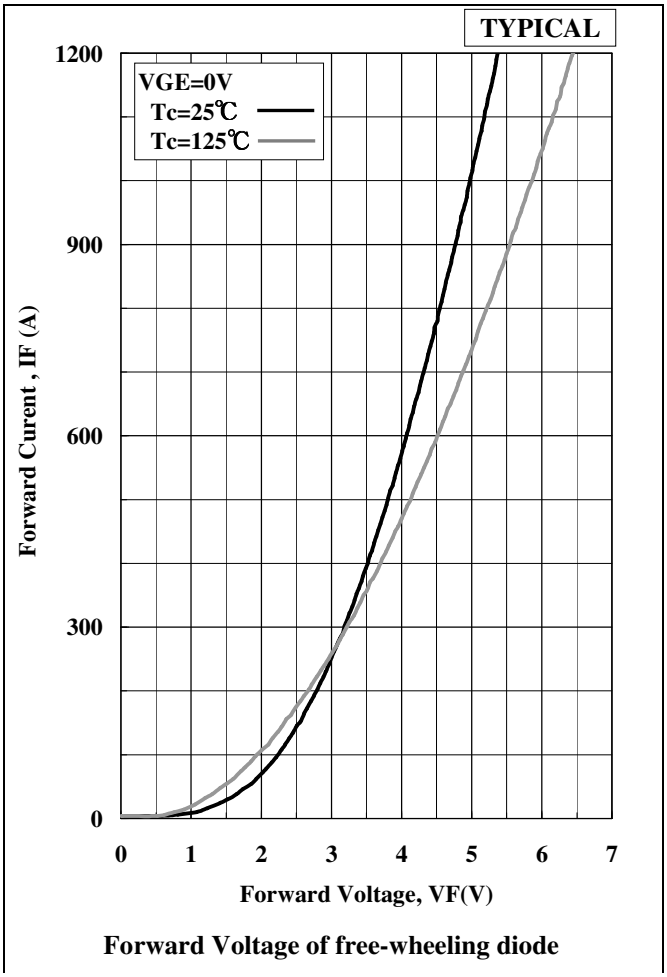


Figure 2 Output characteristics of Diode

DYNAMIC CHARACTERISTICS

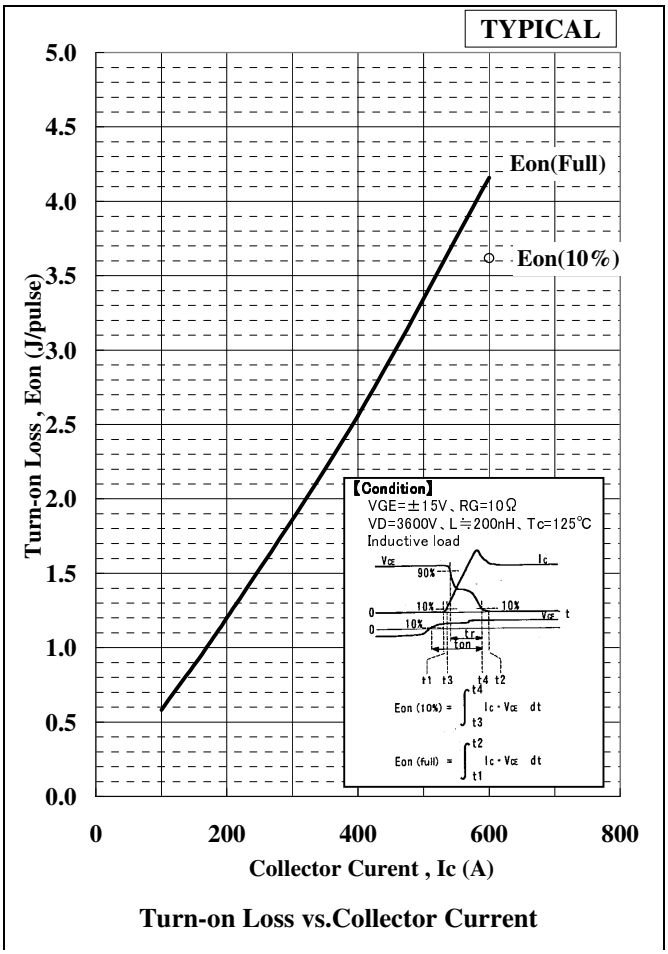


Figure 3 Dependence of Eon on Ic.

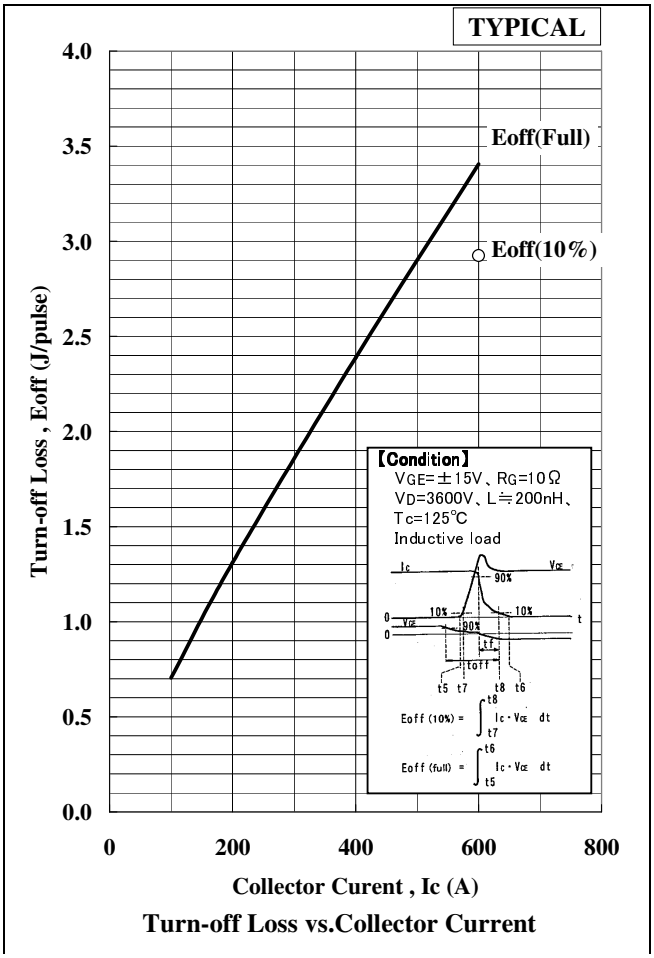


Figure 4 Dependence of Eoff on Ic

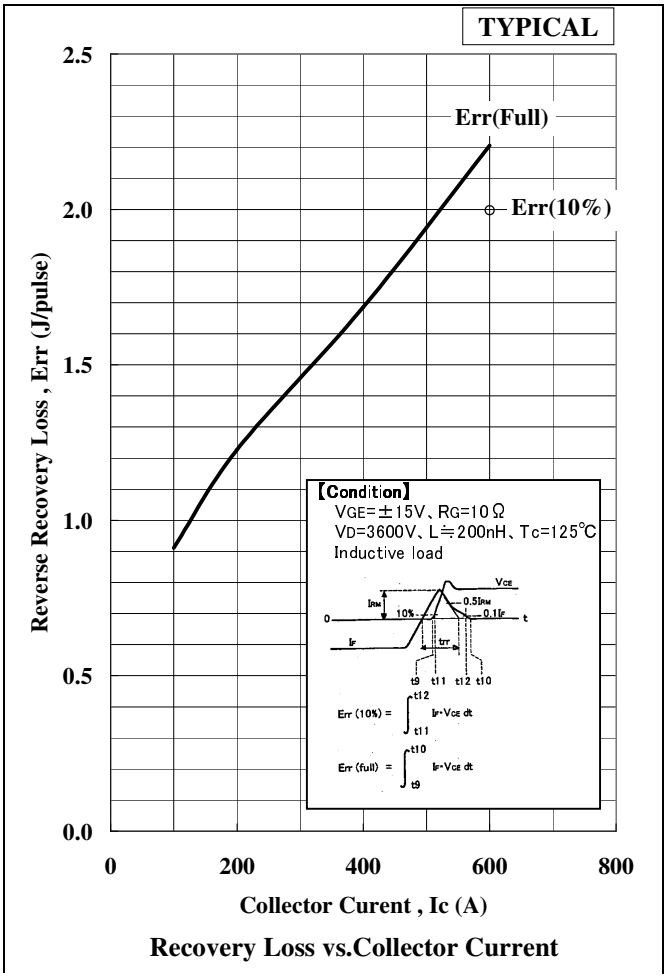


Figure 5 Dependence of Err on Ic

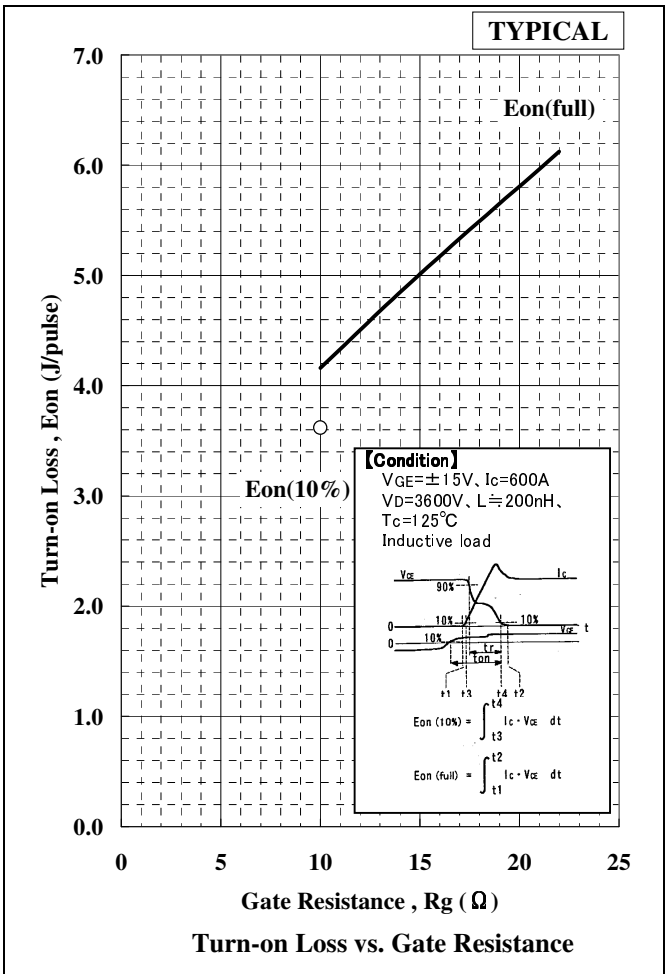


Figure 6 Dependence of Eon on Ic.

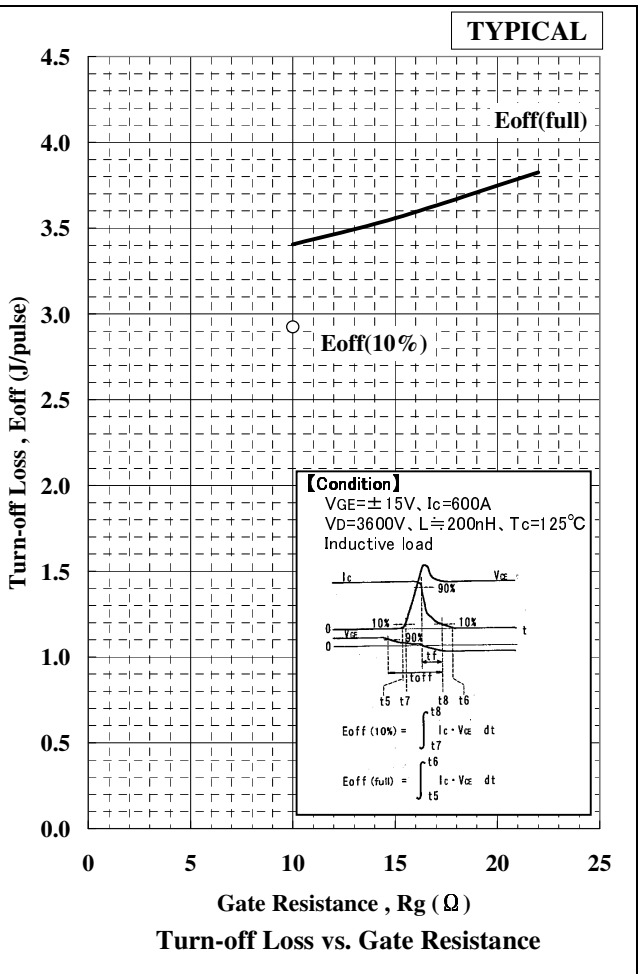


Figure 7 Dependence of Eoff on Ic

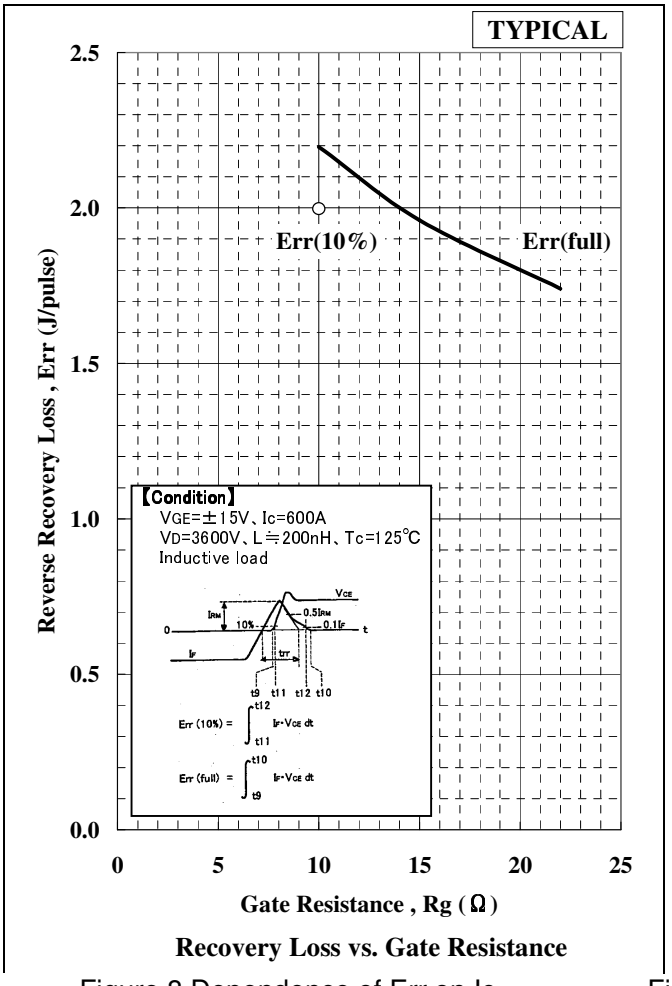


Figure 8 Dependence of Err on Ic

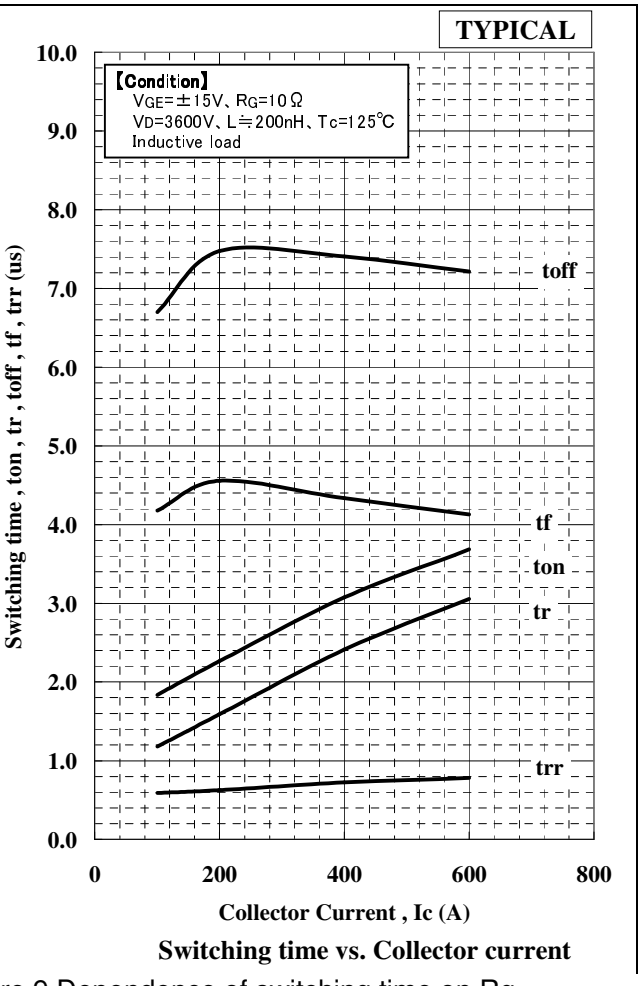
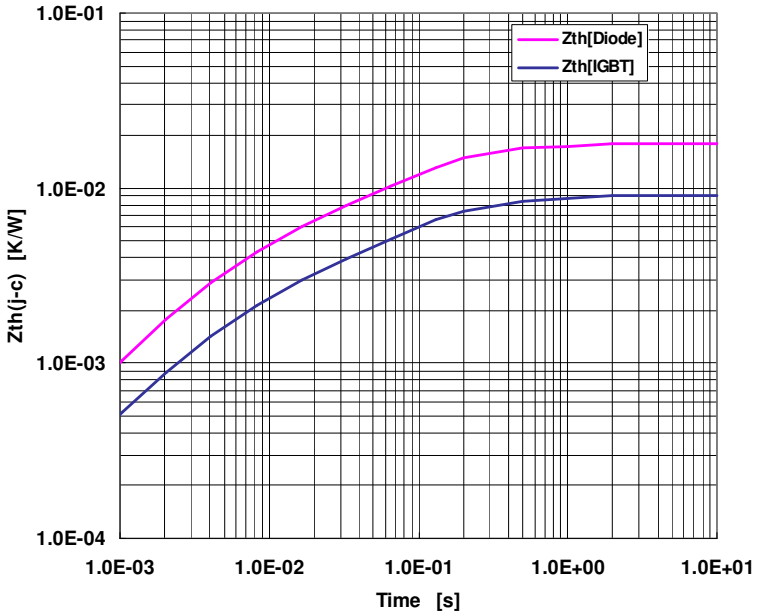
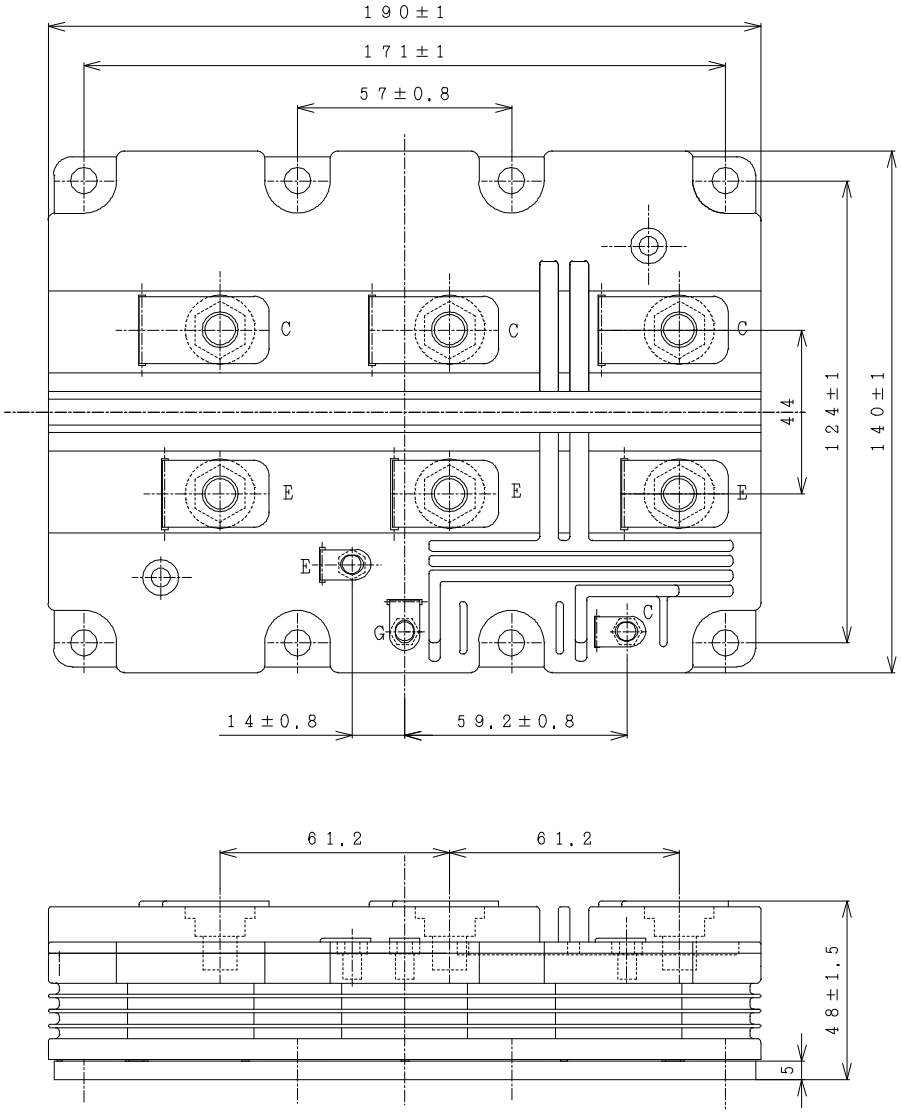


Figure 9 Dependence of switching time on Rg

TRANSIENT THERMAL IMPEDANCE



OUTLINE DRAWING



Unit in mm Weight: 1550(g)

HITACHI POWER SEMICONDUCTORS

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