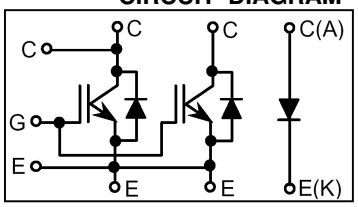
MBL800E33D

Silicon N-channel IGBT

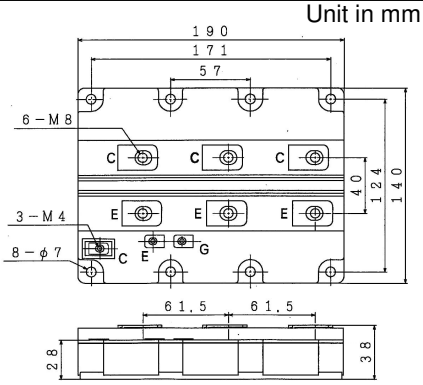
FEATURES

- High thermal fatigue durability.(delta Tc=70℃,N>30,000cycles)
- High speed, low loss IGBT module.
- Low noise due to built-in free-wheeling diode
  – ultra soft fast recovery diode(USFD).
- Low driving power due to low input capacitance MOS gate.
- High reliability, high durability module.
- Isolated heat sink(terminal to base).

CIRCUIT DIAGRAM



OUTLINE DRAWING



Weight : 1300(g)

ABSOLUTE MAXIMUM RATINGS (Tc=25℃)

Item		Symbol	Unit	MBL800E33D
Collector Emitter Voltage		V_{CES}	V	3,300
Gate Emitter Voltage		V_{GES}	V	±20
Collector Current	DC	I_C	A	800
	1ms	I_{Cp}		1,600
Forward Current	DC	I_F	A	800
	1ms	I_{FM}		1,600
Junction Temperature		T_j	℃	-40 ～ +125
Storage Temperature		T_{stg}	℃	-40 ～ +125
Isolation Voltage		V_{ISO}	V_{RMS}	6,000(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 CHARECTERISTICS

1) IGBT + FWD

Item		Symbol	Unit	Min.	Typ.	Max.	Test Conditions
Collector Emitter Cut-Off Current		I_{CES}	mA	-	-	12.0	V_{CE}=3,300V, V_{GE}=0V, Tj=25℃
Gate Emitter Leakage Current		I_{GES}	nA	-	-	±500	V_{GE}=±20V, V_{CE}=0V, Tj=25℃
Collector Emitter Saturation Voltage		$V_{CE(sat)}$	V	-	4.2	5.2	I_C=800A, V_{GE}=15V, Tj=125℃
Gate Emitter Threshold Voltage		$V_{GE(TO)}$	V	4.5	6.0	7.0	V_{CE}=10V, I_C=800mA, Tj=25℃
Input Capacitance		Cies	nF	-	75	-	V_{CE}=10V, V_{GE}=0V,f=100kHz, Tj=25℃
Internal Gate Resistance		Rge	Ω	-	1.8	-	
Switching Times	Rise Time	t_r	μs	-	1.9	3.1	V_{CC}=1,650V, I_C=800A
	Turn On Time	t_{on}		-	2.4	3.3	L=120nH
	Fall Time	t_f		-	1.0	2.5	R_G=4.7Ω (3)
	Turn Off Time	t_{off}		-	3.0	5.1	V_{GE}=±15V, Tj=125℃
Peak Forward Voltage Drop		V_{FM}	V	-	2.5	3.0	-I_C=800A, V_{GE}=0V, Tj=125℃
Reverse Recovery Time		t_{rr}	μs	-	0.6	1.1	V_{CC}=1,650V, I_F=800A (4) L=120nH, Tj=125℃
Thermal Impedance	IGBT	Rth(j-c)	℃/W	-	-	0.013	Junction to case
	FWD	Rth(j-c)		-	-	0.026	

2) DIODE

Item	Symbol	Unit	Min.	Typ.	Max.	Test Conditions
Collector Emitter Cut-Off Current	I_{AKS}	mA	-	-	12.0	V_{AK}=3,300V, Tj=25℃
Peak Forward Voltage Drop	V_F	V	-	2.9	3.4	I_F=800A, Tj=125℃ At Main terminal (Terminal resistance:0.5mΩ typical)
Reverse Recovery Time	t_{rr}	μs	-	0.6	1.1	I_F =800A, V_{CC}=1,650V (4) L=120nH, Tj=125℃
Thermal Impedance	Rth(j-c)	℃/W			0.026	Junction to case

Notes: (3) R_G value is the test condition's value for decision 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.
(4)Counter arm IGBT VGE=±15V

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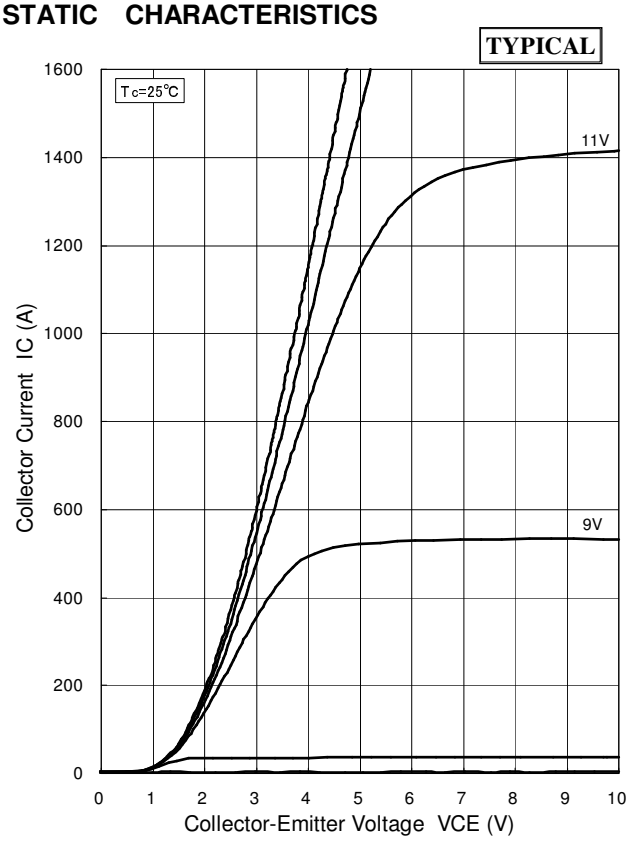
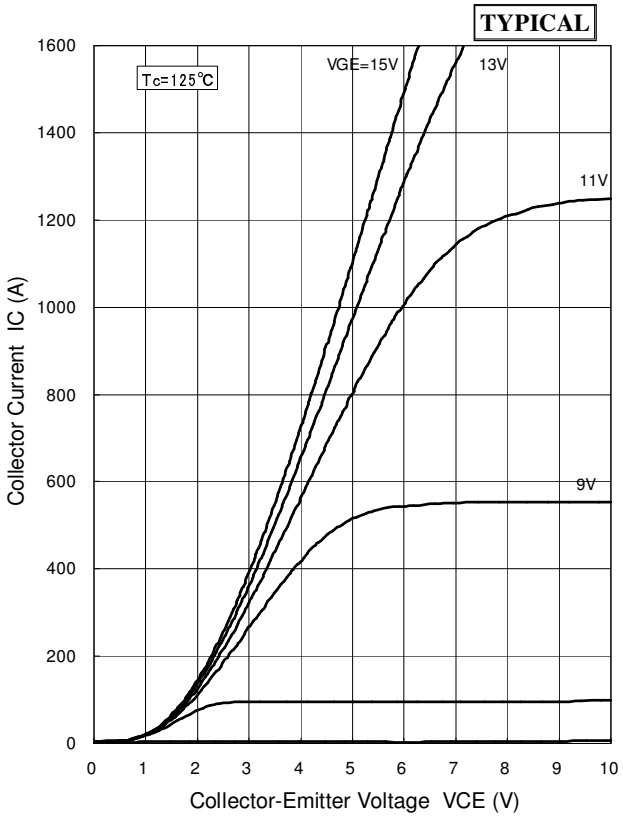
CHARACTERISTICS CURVE

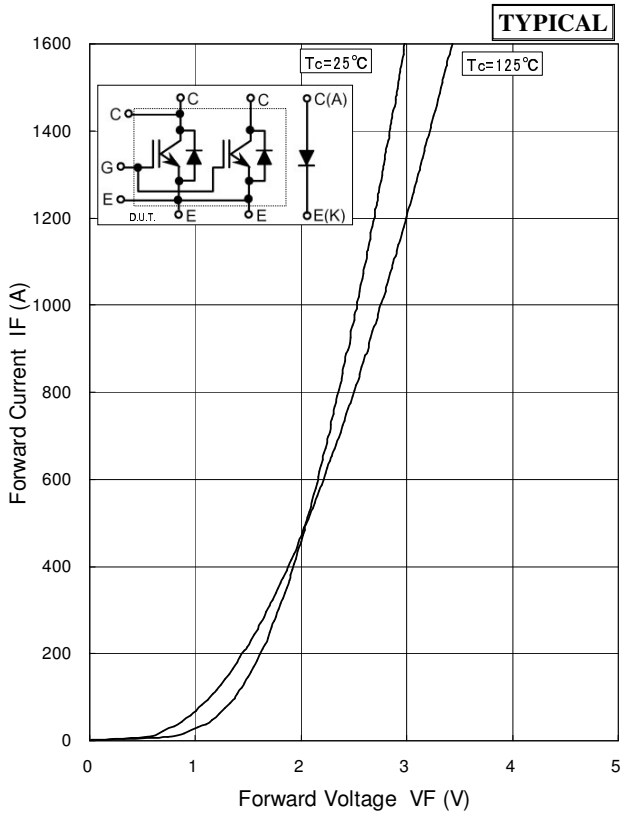
STATIC CHARACTERISTICS



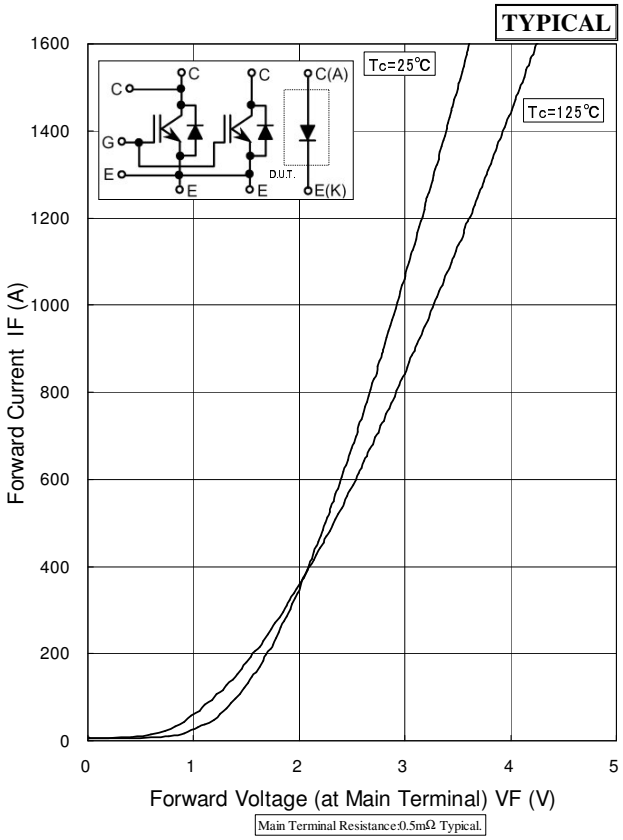
Collector Current vs.Collector to Emitter Voltage



Collector Current vs.Collector to Emitter Voltage



Forward Voltage of free-wheeling diode



Forward Voltage of chopper diode

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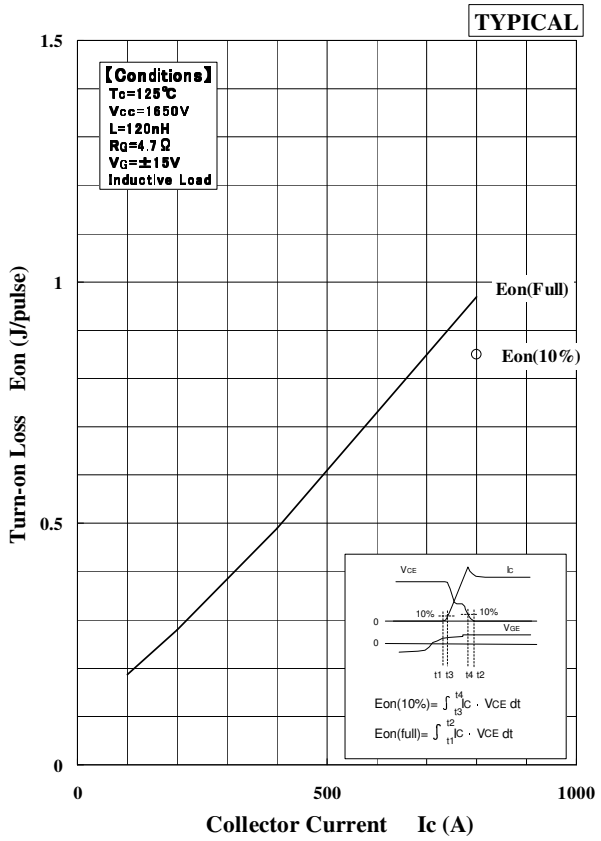
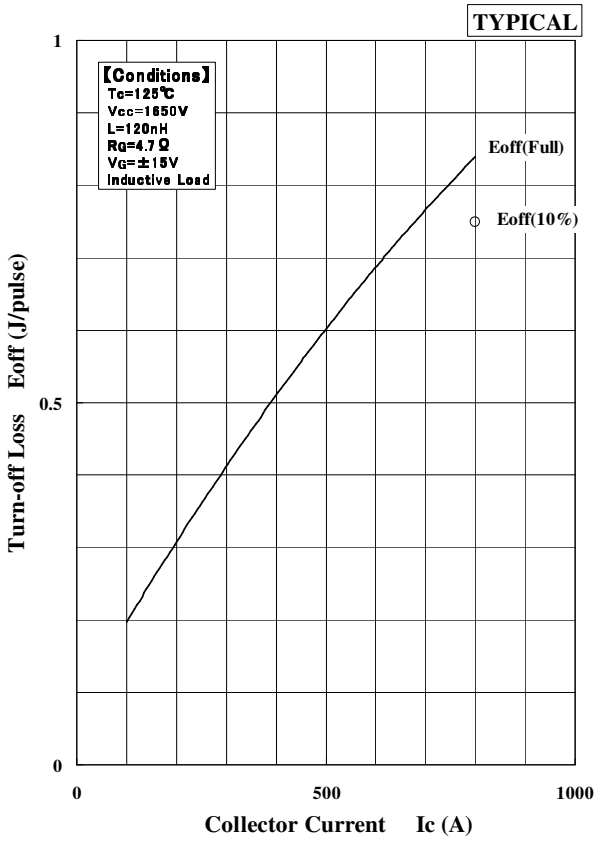
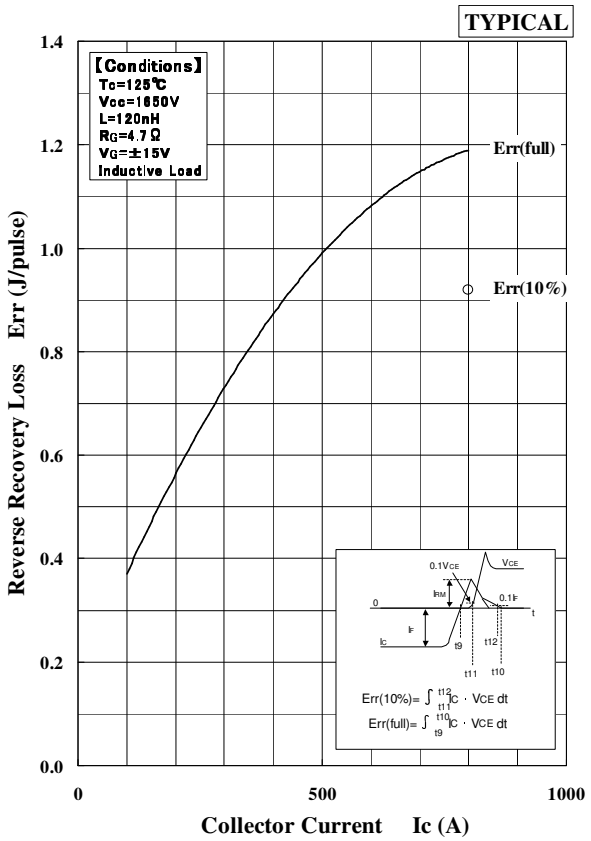
DEPENDENCE OF CURRENT



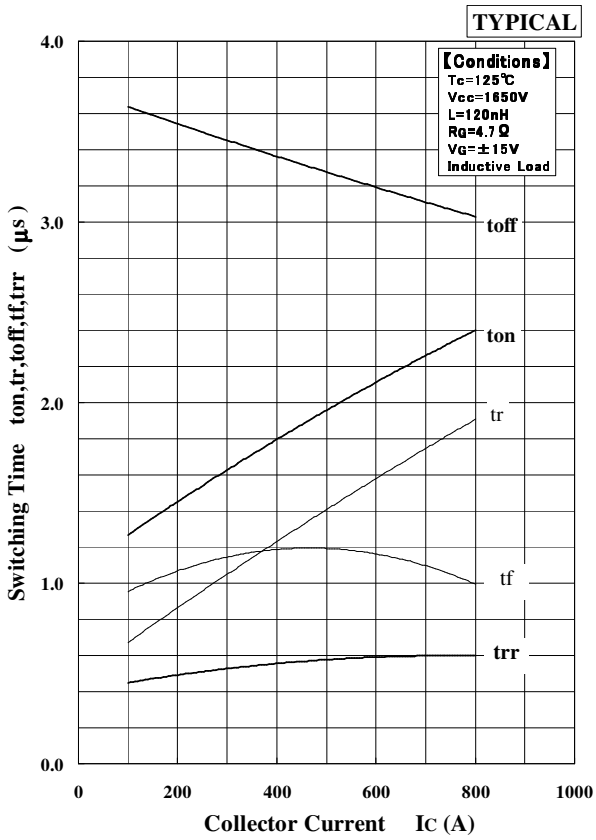
Turn-on Loss vs. Collector Current



Turn-off Loss vs. Collector Current



Recovery Loss vs. Collector Current



Switching Time vs. Collector Current

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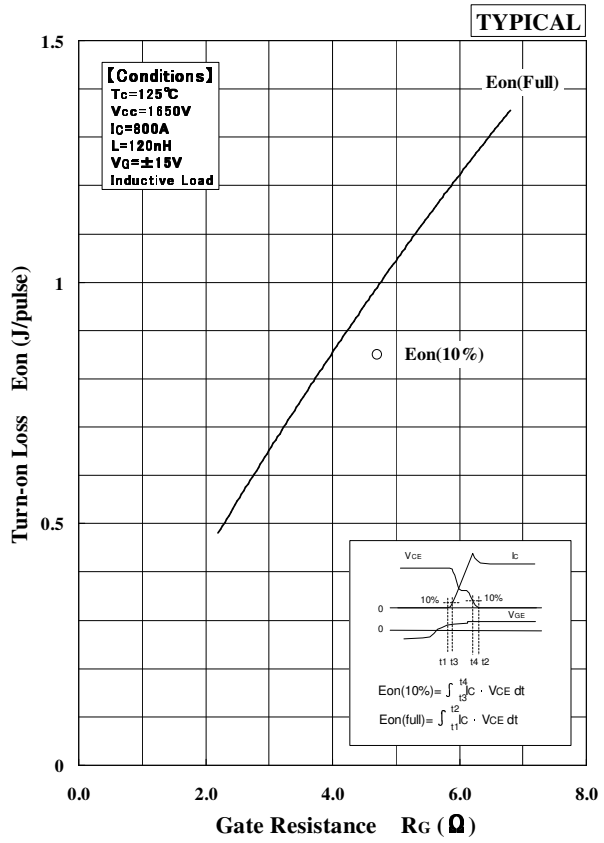
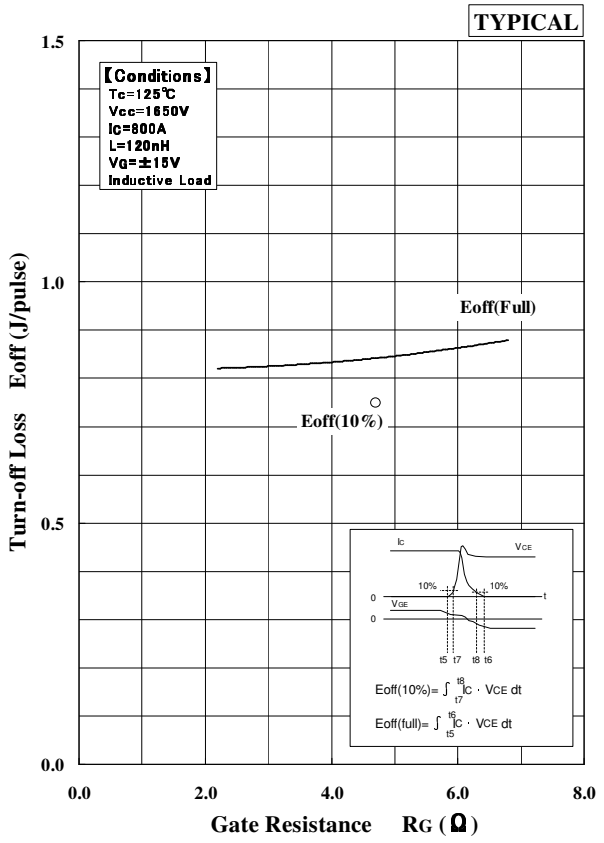
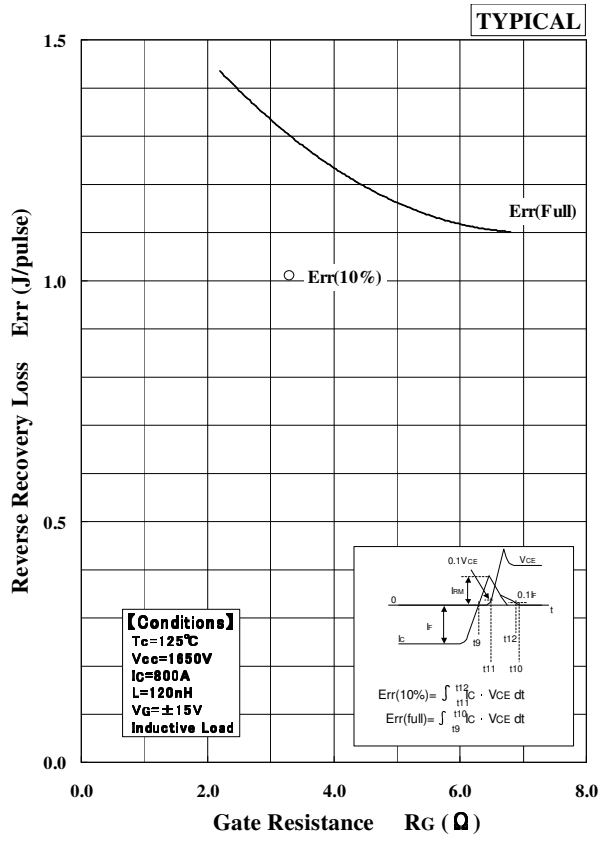
DEPENDENCE OF RG



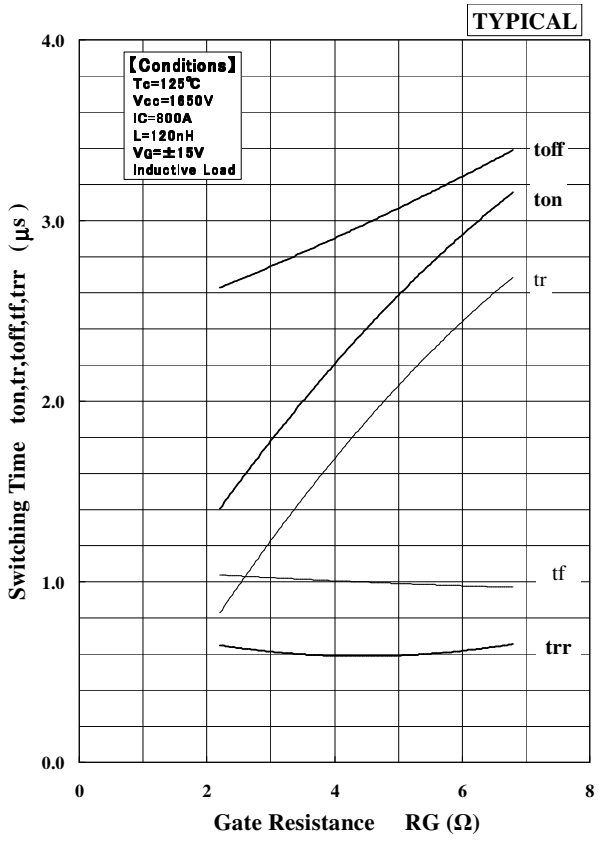
Turn-on Loss vs. Gate Resistance



Turn-off Loss vs. Gate Resistance



Recovery Loss vs. Gate Resistance



Switching Time vs. Gate Resistance

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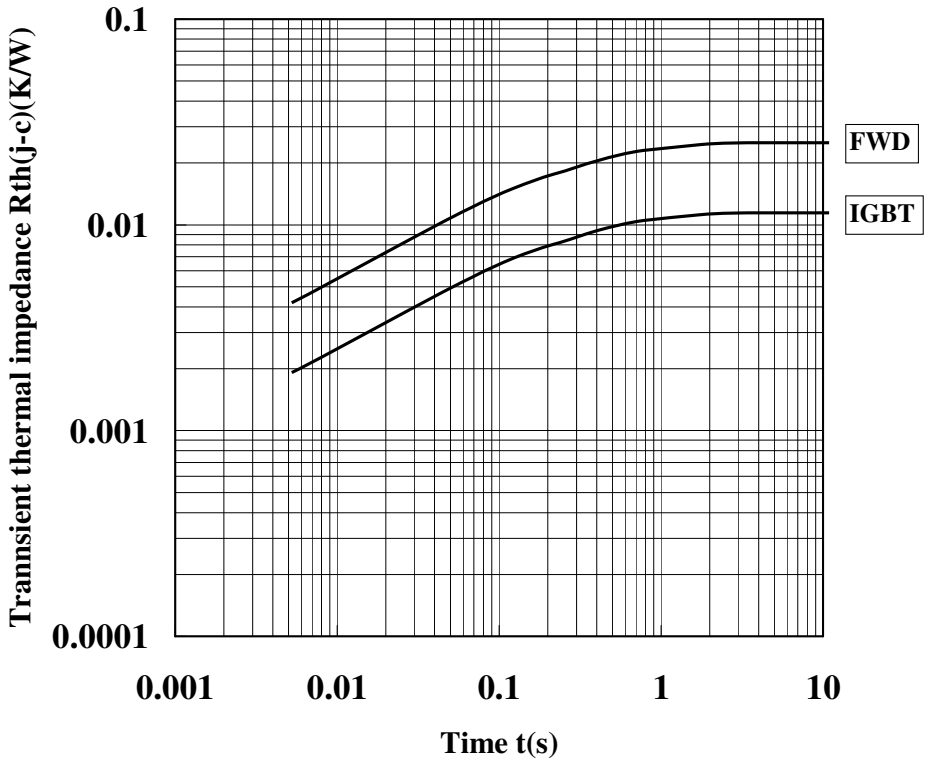
Thermal Impedance
TRANSIENT THERMAL IMPEDANCE



Transient Thermal Impedance Curve *(Maximum Value)*

HITACHI POWER SEMICONDUCTORS

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