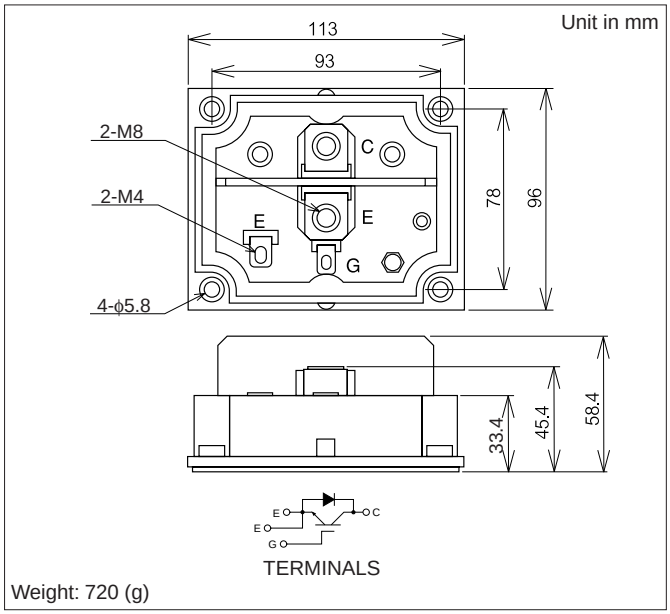
MBN400C33A

Silicon N-channel IGBT

FEATURES

- High thermal fatigue durability.
  (delta Tc=70°C,N>20,000cycles)
- low noise due to built-in free-wheeling diode - ultra soft fast recovery diode(USFD).
- High speed,low loss IGBT module.
- Low driving power due to low input capacitance MOS gate.
- High reliability,high durability module.
- Isolated head sink (terminal to base).

OUTLINE DRAWING



Weight: 720 (g)

ABSOLUTE MAXIMUM RATINGS (Tc=25°C)

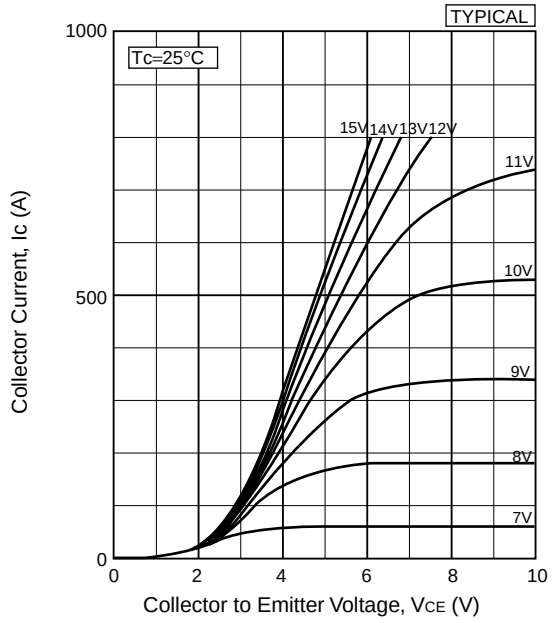
Item		Symbol	Unit	MBN400C33A
Collector Emitter Voltage		V_{CES}	V	3,300
Gate Emitter Voltage		V_{GES}	V	±20
Collector Current	DC	I_C	A	400
	1ms	I_{Cp}		800
Forward Current	DC	I_F	A	400
	1ms	I_{FM}		800
Collector Power Dissipation		Pc	W	4,000
Junction Temperature		T_j	°C	-40 ~ +125
Storage Temperature		T_{stg}	°C	-40 ~ +125
Isolation Voltage		V_{ISO}	V_{RMS}	5,400(AC 1 minute)
Screw Torque	Terminals(M4/M8)	-	N.m	2/10 (1)
	Mounting(M5)	-		2.8 (2)

Notes: (1)Recommended Value 1.8±0.2/9±1N.m (2)Recommended Value 2.6±0.2N.m

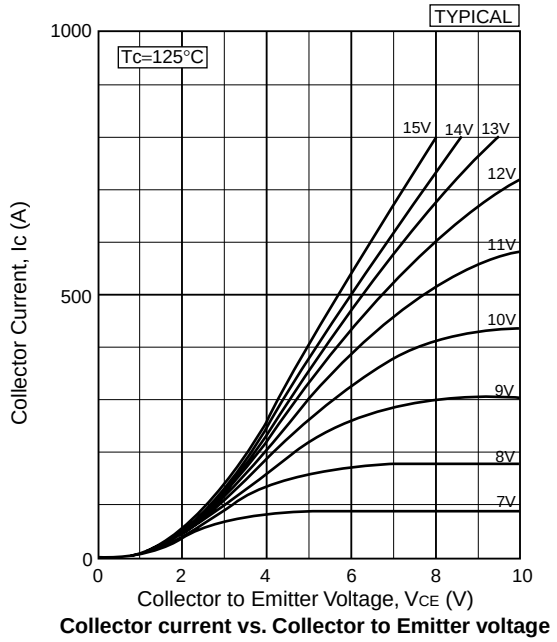
CHARACTERISTICS (Tc=25°C)

Item		Symbol	Unit	Min.	Typ.	Max.	Test Conditions
Collector Emitter Cut-Off Current		I_{CES}	mA	-	-	4.0	V_{CE}=3,300V,V_{GE}=0V
Gate Emitter Leakage Current		I_{GES}	nA	-	-	±200	V_{GE}=±20V,V_{CE}=0V
Collector Emitter Saturation Voltage		$V_{CE(sat)}$	V	-	4.5	5.5	I_C=400A,V_{GE}=15V
Gate Emitter Threshold Voltage		$V_{GE(TO)}$	V	4.0	5.5	7.0	V_{CE}=10V, I_C =400mA
Input Capacitance		C_{ies}	nF	-	50	-	V_{CE}=10V,V_{GE}=0V,f=100KHz
Switching Times	Rise Time	t_r	μs	-	1.6	2.6	V_{CC}=1,650V,Ic=400A
	Turn On Time	t_{on}		-	2.3	3.2	L=150nH
	Fall Time	t_f		-	2.1	2.8	R_G=10Ω (3)
	Turn Off Time	t_{off}		-	3.4	5.3	V_{GE}=±15V Tc=125°C
Peak Forward Voltage Drop		V_{FM}	V	-	3.0	4.0	–Ic=400A,V_{GE}=0V
Reverse Recovery Time		t_{rr}	μs	-	0.5	0.9	Vcc=1,650V,–Ic=400A,L=150nH, Tc=125°C (4)
Thermal Impedance	IGBT	Rth(j-c)	°C/W	-	-	0.025	Junction to case
	FWD	Rth(j-c)		-	-	0.05	

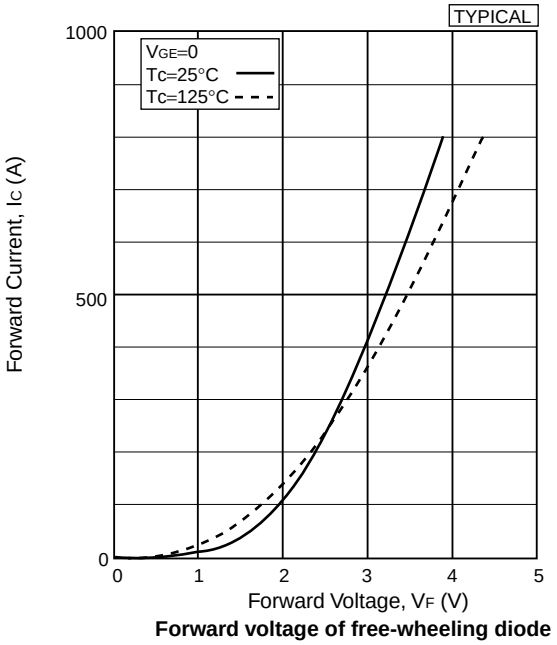
Notes:(3) R_G value is the test condition's value for decision of the switching times, not recommended value.
Determine the suitable R_G value after the measurement of switching waveforms
(overshoot voltage,etc.)with appliance mounted.
(4) Counter arm IGBT V_{GE}=–15V



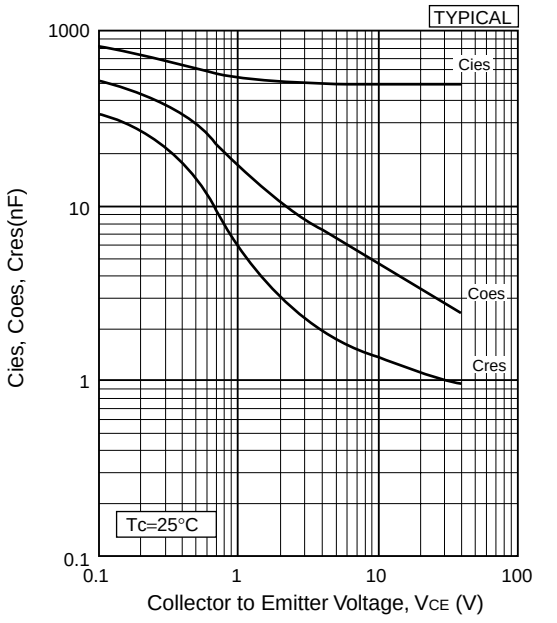
Collector current vs. Collector to Emitter voltage



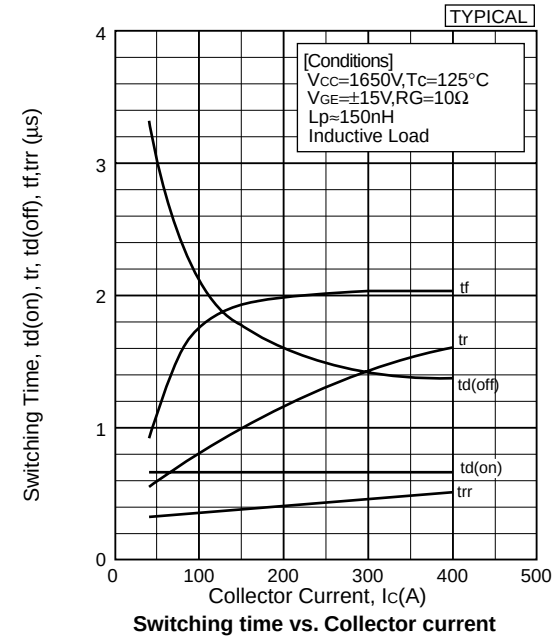
Collector current vs. Collector to Emitter voltage



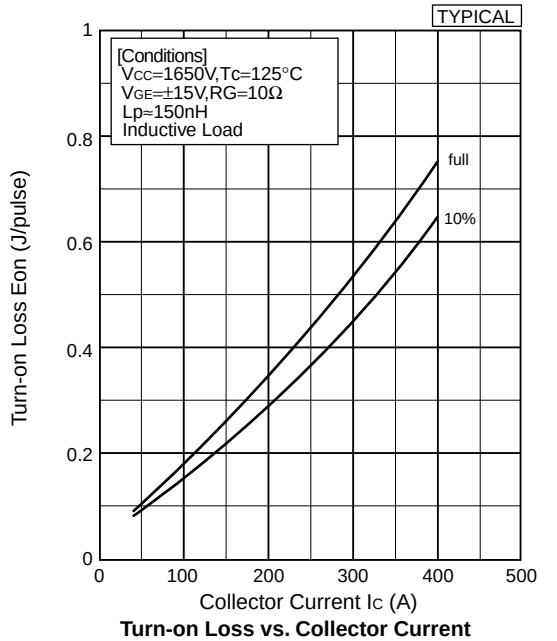
Forward voltage of free-wheeling diode



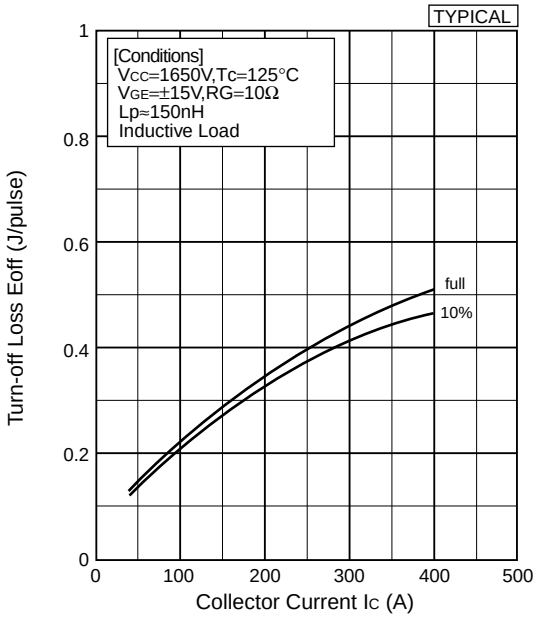
Capacitance vs. Collector to Emitter Voltage



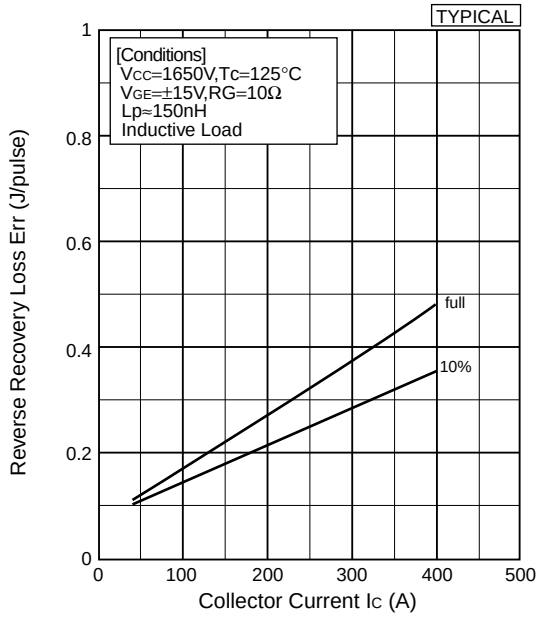
Switching time vs. Collector current



Turn-on Loss vs. Collector Current



Turn-off Loss vs. Collector Current



Reverse Recovery Loss vs. Collector Current

HITACHI POWER SEMICONDUCTORS

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