

MITSUBISHI IGBT Module

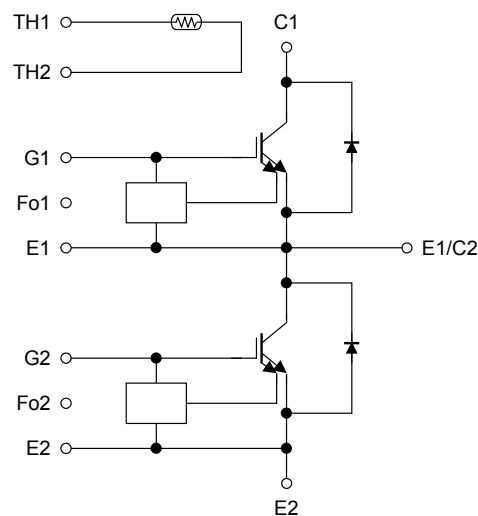
MG400V2YS60A

High Power Switching Applications

Motor Control Applications

- The electrodes are isolated from case.
- Enhancement-mode
- Thermal output terminal (TH)

Equivalent Circuit



Maximum Ratings (Ta = 25°C)

Characteristic		Symbol	Rating	Unit
Collector-emitter voltage		V_{CES}	1700	V
Gate-emitter voltage		V_{GES}	± 20	V
Collector current	DC	I_C	400	A
Forward current	DC	I_F	400	A
Collector power dissipation (Tc = 25°C)		P_C	4300	W
Junction temperature		T_j	150	°C
Storage temperature range		T_{stg}	-40~125	°C
Isolation voltage		V_{isol}	4000 (AC 1 min)	V
Screw torque	Terminal: M8	—	10	N·m
	Mounting: M5	—	3	N·m

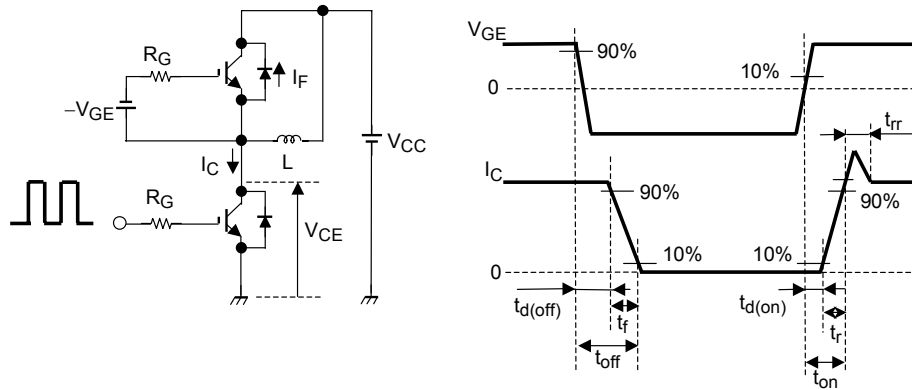
Electrical Characteristics (Ta = 25°C)

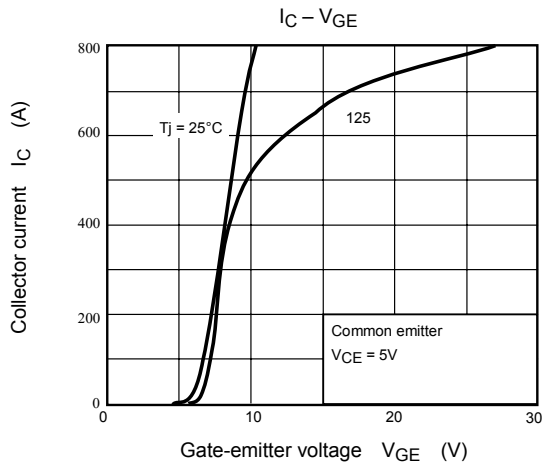
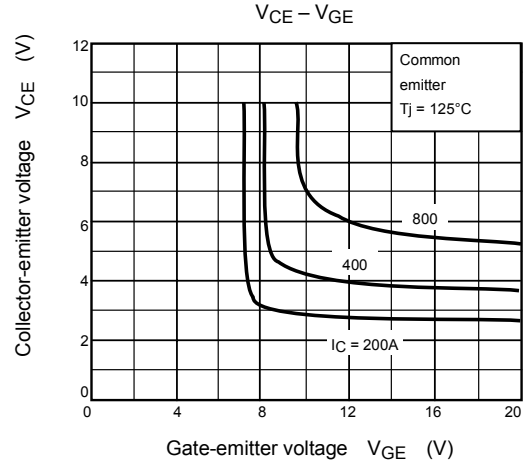
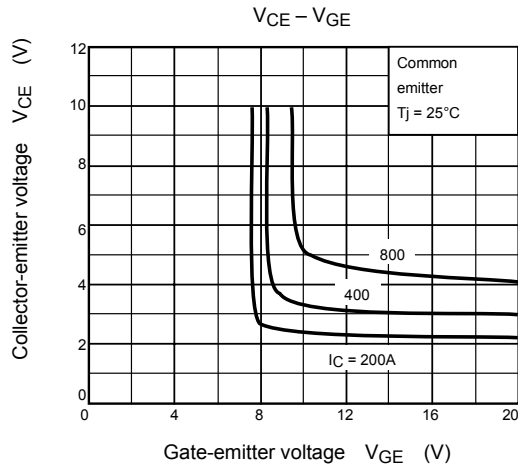
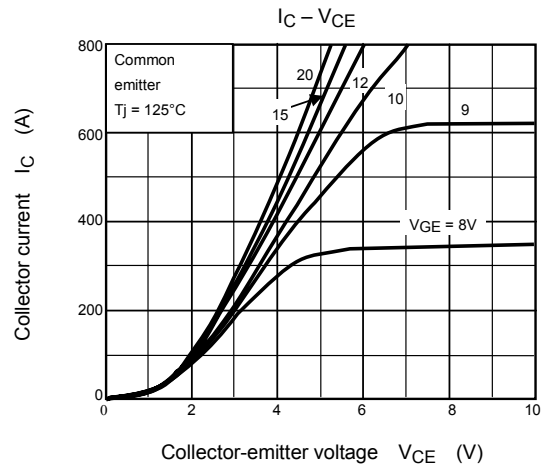
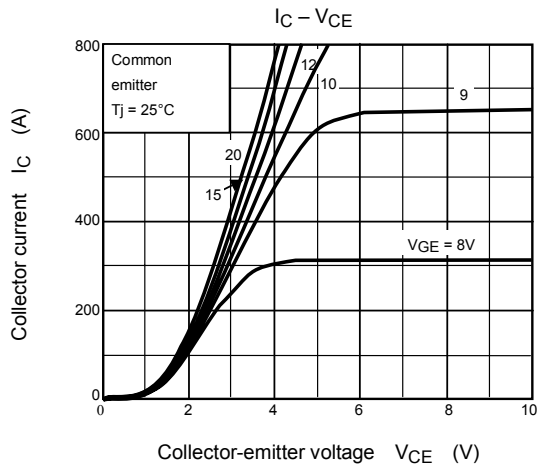
Characteristic		Symbol	Test Condition		Min.	Typ.	Max.	Unit
Gate leakage current		I _{GES}	V _{GE} = ±20V, V _{CE} = 0V		—	—	±10	μA
Collector cut-off current		I _{CES}	V _{CE} = 1700V, V _{GE} = 0V		—	—	1	mA
Gate-emitter cut-off voltage		V _{GE(off)}	I _C = 400mA, V _{CE} = 5V		4.5	5.5	6.5	V
Collector-emitter saturation voltage		V _{CE(sat)}	I _C = 400A	T _J = 25°C	—	3.0	3.4	V
			V _{GE} = 15V	T _J = 125°C	—	3.8	4.2	
Input capacitance		C _{ies}	V _{CE} = 10V, V _{GE} = 0V, f = 1MHz		—	45000	—	pF
Gate-emitter voltage		V _{GE}	—		13	15	17	V
Gate resistance		R _G	—		8.2	—	15	Ω
Switching time	Turn-on delay time	t _{d(on)}	Inductive load V _{CC} = 900V I _C = 400A V _{GE} = ±15V R _G = 8.2Ω (Note)		—	0.35	—	μs
	Rise time	t _r			—	0.2	—	
	Turn-on time	t _{on}			—	0.55	—	
	Turn-off delay time	t _{d(off)}			—	0.9	—	
	Fall time	t _f			—	0.4	0.6	
	Turn-off time	t _{off}			—	1.3	—	
Forward voltage		V _F	I _F = 400A,	T _J = 25°C	—	3.2	4.2	V
			V _{GE} = 0V	T _J = 125°C	—	2.4	—	
Reverse recovery time		t _{rr}	I _F = 400A, V _{GE} = -15V di/dt = 2000A/μs		—	0.20	0.40	μs
Thermal resistance		R _{th(j-c)}	Transistor stage		—	—	0.029	°C / W
			Diode stage		—	—	0.056	
RTC operating current		I _{Rtc}	T _J = 25°C		800	—	—	A

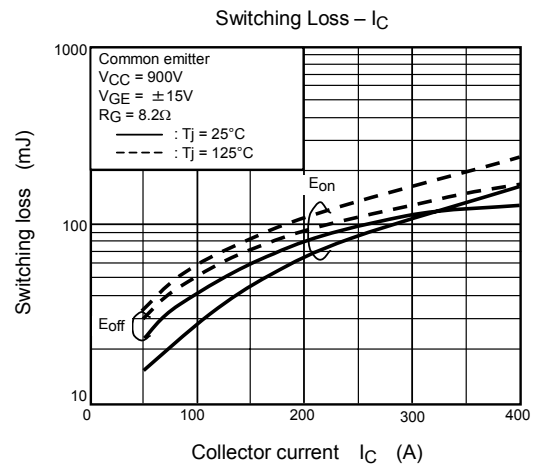
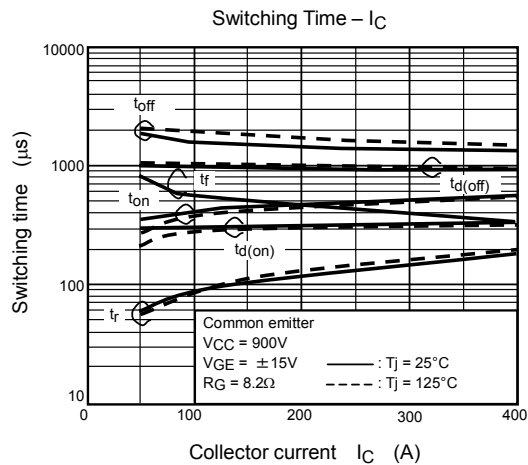
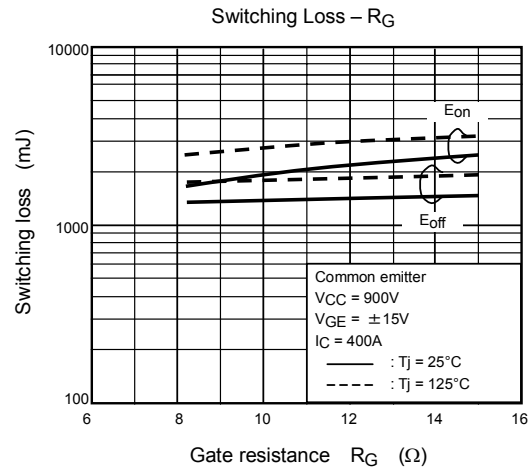
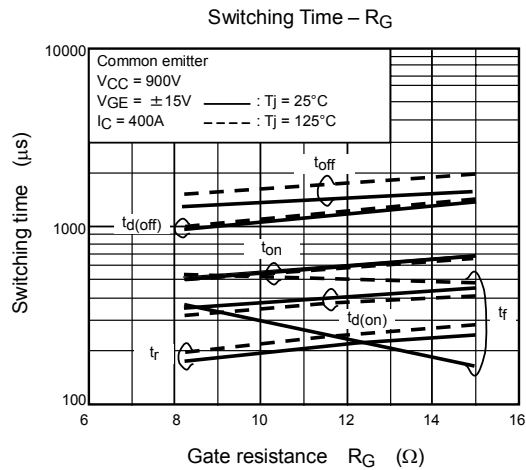
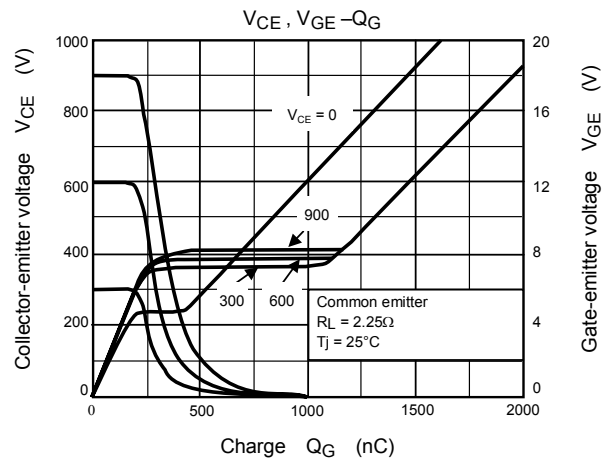
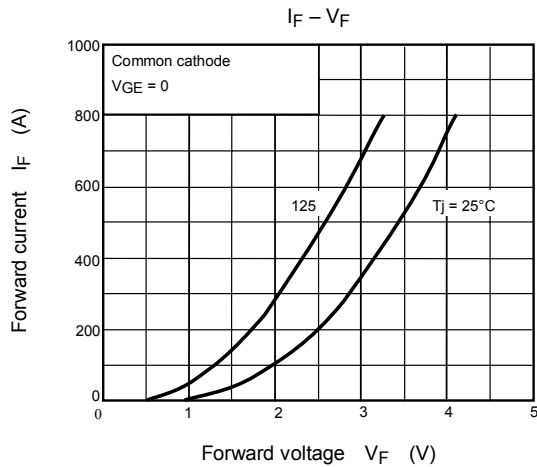
Thermistor

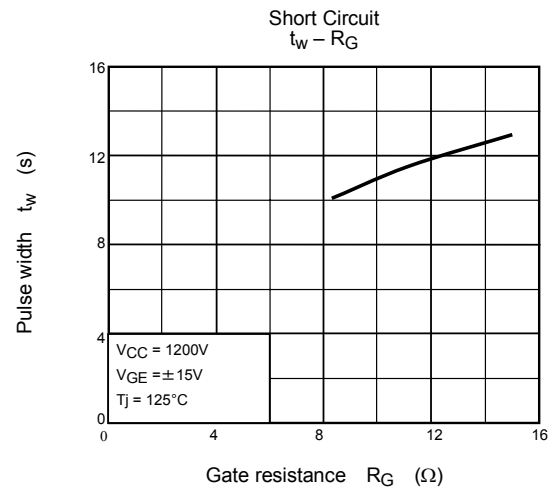
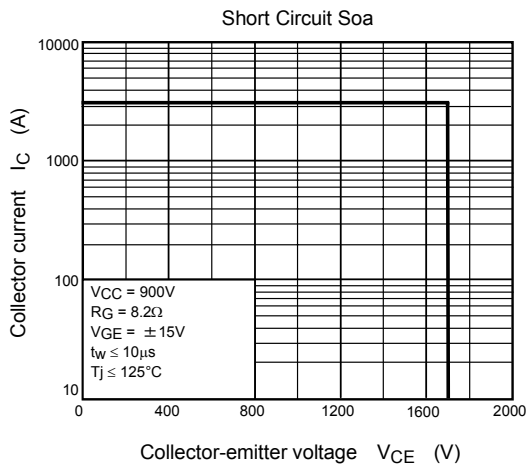
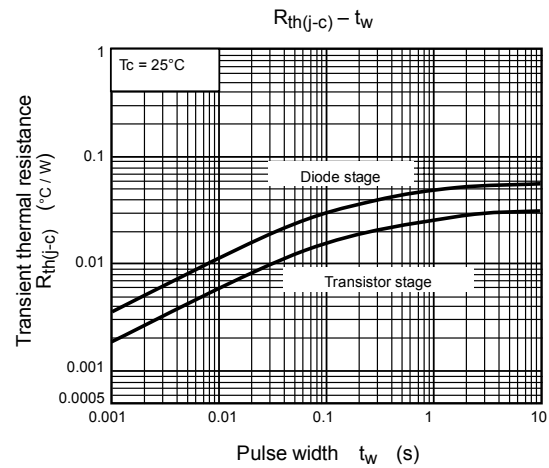
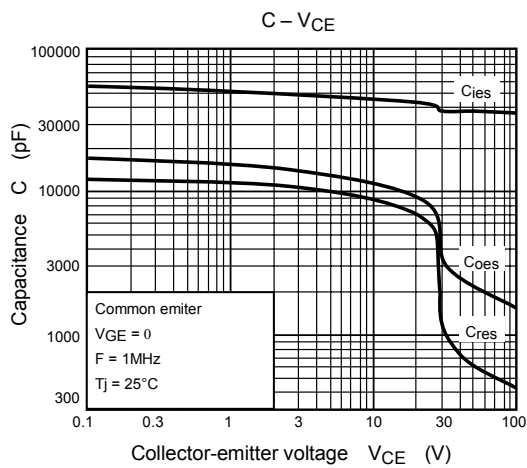
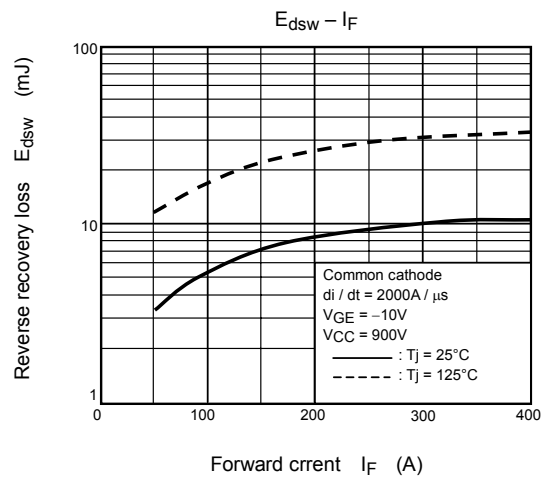
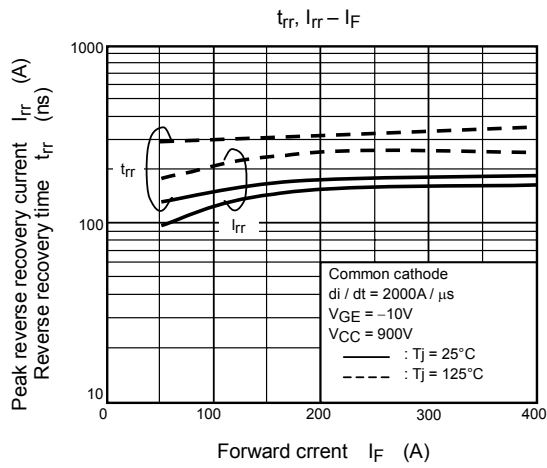
Characteristic	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Zero power resistance	R25	$T_c = 25^\circ\text{C}$	—	100	—	k Ω
B value	R25 / 85	$T_c = 25^\circ\text{C} / T_c = 85^\circ\text{C}$	—	4390	—	K
Isolation voltage		$T_c = 25^\circ\text{C}$	2500	—	—	V _{rms}

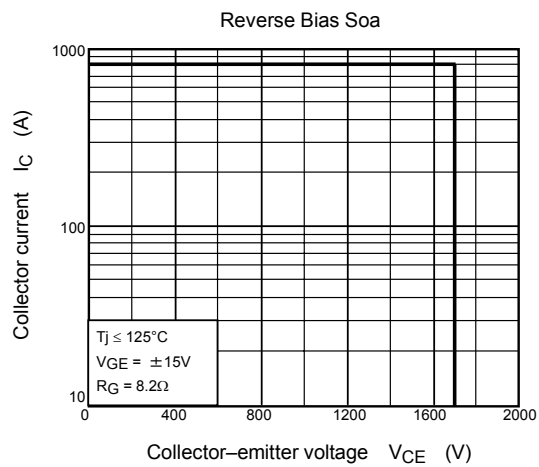
(Note) : Switching time measurement circuit and input / output waveforms











<V_{CE(sat)} Rank>V_{CE(sat)}

Rank Symbol	Min.	Max.
29	2.6	2.9
30	2.7	3.0
31	2.8	3.1
32	2.9	3.2
33	3.0	3.3
34	3.1	3.4

<V_F Rank>V_F

Rank Symbol	Min	Max.
G	2.5	2.8
H	2.7	3.0
I	2.9	3.2
J	3.1	3.4
K	3.3	3.6
L	3.5	3.8
M	3.7	4.0
N	3.9	4.2

<Mark Position>

