

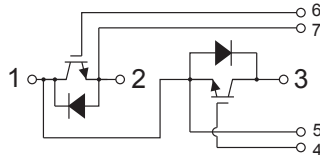


IGBT Module 200A

Features

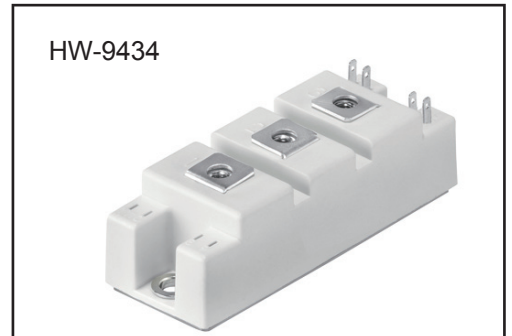
- ◆ Non Punch Through (NPT) Technology
- ◆ IGBT trench technology
- ◆ Superfast diodes
- ◆ High short circuit capability

Preliminary



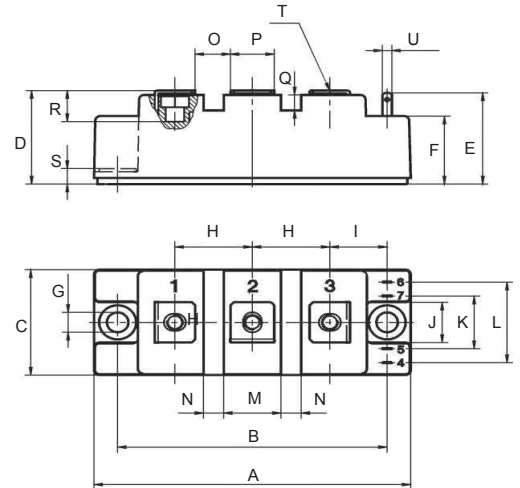
Applications

- ◆ Welder / Power Supply
- ◆ UPS / Inverter
- ◆ Industrial Motor Drive



Maximum Ratings (T_C=25°C)

Item	Symbol	Rated Value	Unit
Collector-Emitter Voltage	V _{CES}	600	V
Gate-Emitter Voltage	V _{GES}	±20	V
Collector Current	DC	I _C	A
	1ms	I _{CP}	
Collector Power Dissipation	P _C	780	W
Isolation Voltag (e Terminal to Base, AC 1 min.)	V _{iso}	2500	V
Junction Temperature Range	T _J	-40~+150	°C
Storage Temperature Range	T _{stg}	-40~+125	°C
Mounting Torque	Module Base to Heatsink	5	N.m
	Busbar to Terminal	5	



DIM	DIMENSIONS				NOTE
	INCHES		MM		
	MIN	MXA	MIN	MXA	
A	...	3.700	...	94.0	
B	3.134	3.165	79.6	80.4	
C	...	1.339	...	34.0	
D	...	1.201	...	30.5	
E	...	1.181	...	30.0	
F866	...	22.0	
G252	...	6.4	∅
H	.894	.917	22.7	23.3	
I670	...	17.0	
J512	...	13.0	
K677	...	17.2	
L	...	1.024	...	26.0	
M699	...	17.0	
N236	...	6.0	
O413	...	10.5	
P512	...	13.0	
Q217	...	5.5	
R512	...	13.0	
S197	...	5.0	
T	M5				
U	...	110*20	...	2.8*0.5	



■ **Electrical Characteristics** ($T_C=25^{\circ}C$)

Characteristic		Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Collector-Emitter Cut-Off Current		I_{CES}	$V_{CE}=600V$ $V_{GE}=0V$	-	-	2	mA
Gate-Emitter Leakage Current		I_{GES}	$V_{GE}=\pm 20V$ $V_{CE}=0V$	-	-	500	nA
Collector-Emitter Saturation Voltage		$V_{CE(sat)}$	$I_C=200A, V_{GE}=15V$	-	2.1	2.6	V
Gate-Emitter Threshold Voltage		$V_{GE(th)}$	$V_{CE}=5V, I_C=200mA$	4	-	8	V
Input Capacitance		C_{ies}	$V_{CE}=10V, V_{GE}=0V, f=1MHz$	-	20000	-	pF
Switching Time	Rise Time	t_r	$V_{CC}=300V$ $R_L=3\Omega$ $R_G=3.6\Omega$ $V_{GE}=\pm 15V$	-	0.15	0.3	μs
	Turn-On Time	t_{on}		-	0.25	0.4	
	Fall Time	t_f		-	0.2	0.35	
	Turn-Off Time	t_{off}		-	0.45	0.7	

■ **Free Wheeling Diode Ratings & Characteristics** ($T_C=25^{\circ}C$)

Item		Symbol	Rated Value	Unit
Forward Current	DC	I_F	200	A
	1ms	I_{FM}	400	

Characteristic	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Peak Forward Voltage	V_F	$I_F=200A, V_{GE}=0V$	-	1.7	2.0	V
Reverse Recovery Time	t_{rr}	$I_F=200A, V_{GE}=-10V$ $di/dt=200A/\mu s$	-	0.12	0.15	μs

■ **Thermal Characteristics** ($T_C=25^{\circ}C$)

Characteristic		Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Thermal Impedance	IGBT	$R_{th(j-c)}$	Junction to Case	-	-	0.16	$^{\circ}C/W$
	Diode			-	-	0.38	



Typical Characteristics

Fig. 1 Output Characteristics (Typical)

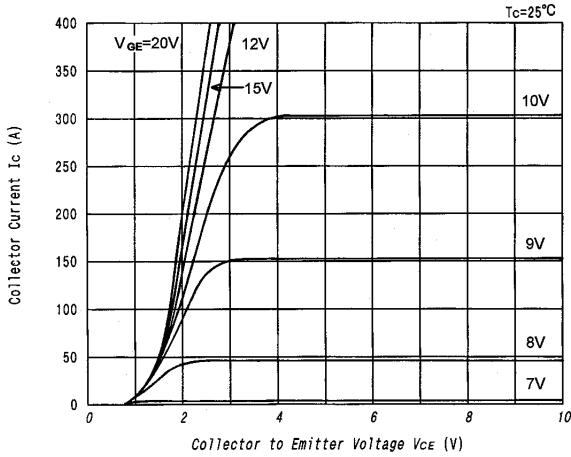


Fig. 2 Collector to Emitter on Voltage vs. Gate to Emitter Voltage (Typical)

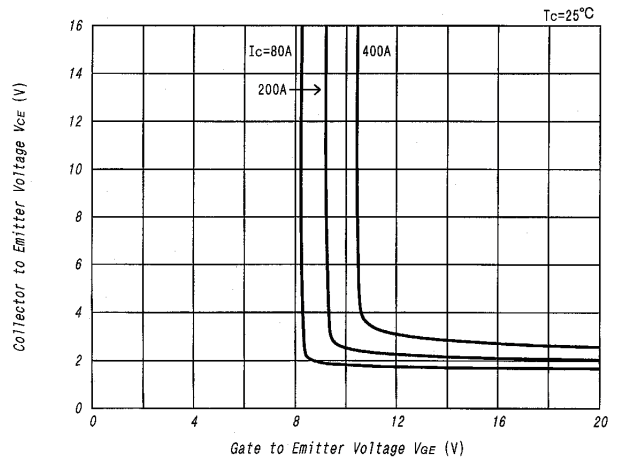


Fig. 3 Collector to Emitter on Voltage vs. Gate to Emitter Voltage (Typical)

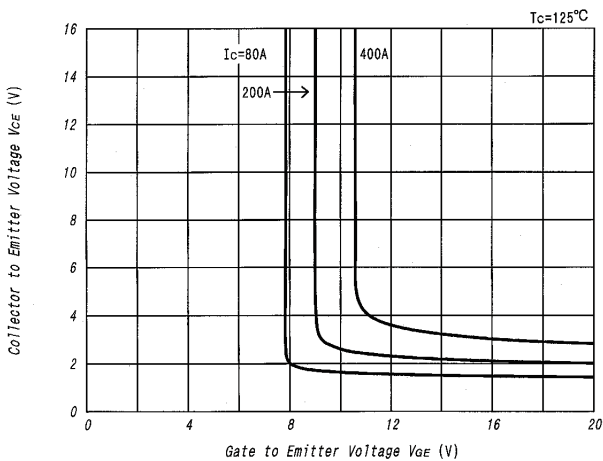


Fig. 4 Gate Charge vs. Collector to Emitter Voltage (Typical)

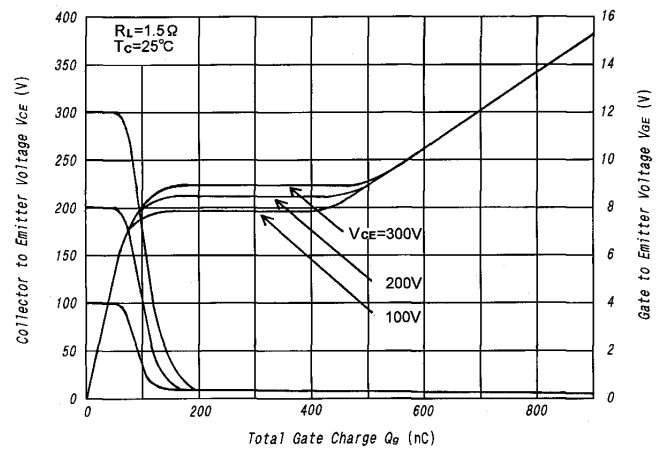


Fig. 5 Capacitance vs. Collector to Emitter Voltage (Typical)

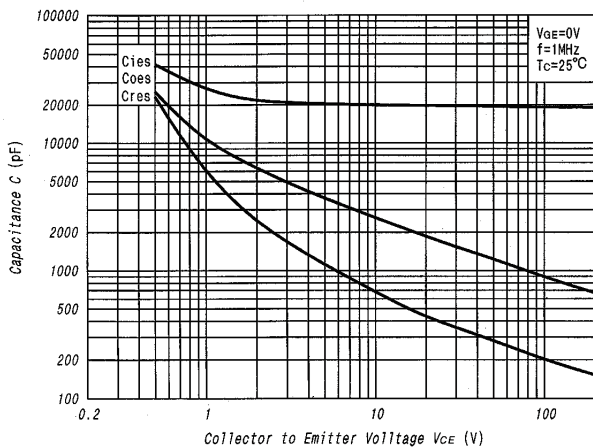
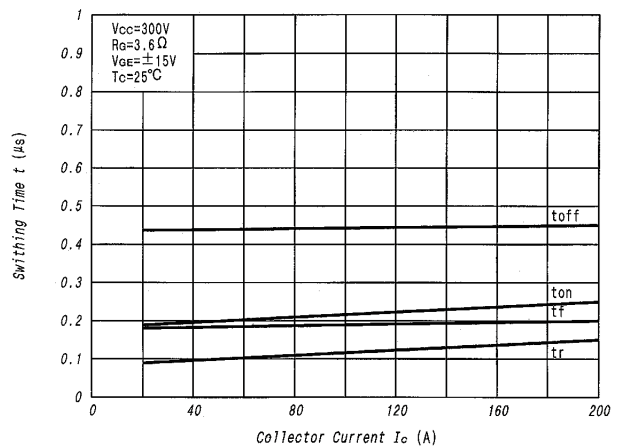


Fig. 6 Collector Current vs. Switching Time (Typical)





Typical Characteristics

Fig.7 Series Gate Impedance vs. Switching Time (Typical)

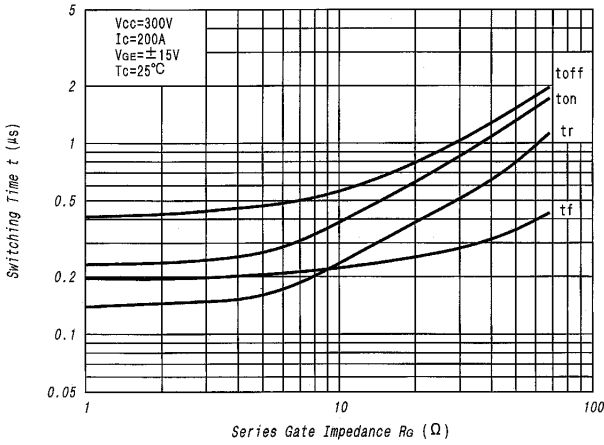


Fig.8 Forward Characteristics of Free Wheeling Diode (Typical)

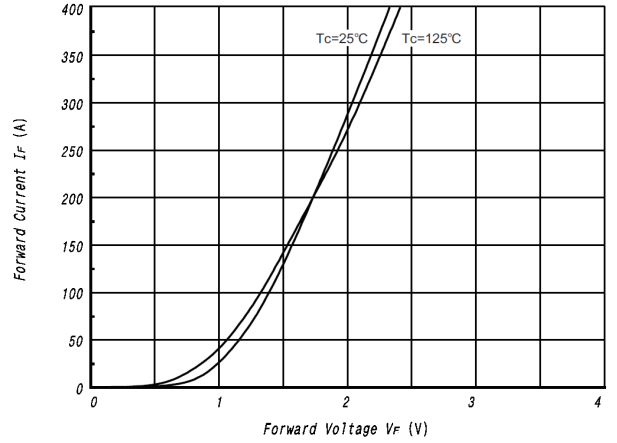


Fig.9 Reverse Recovery Capacitance (Typical)

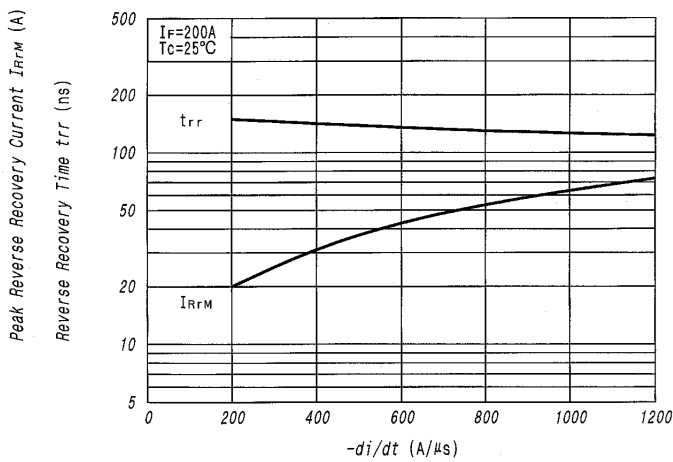


Fig.10 Reverse Bias Safe Operating Area

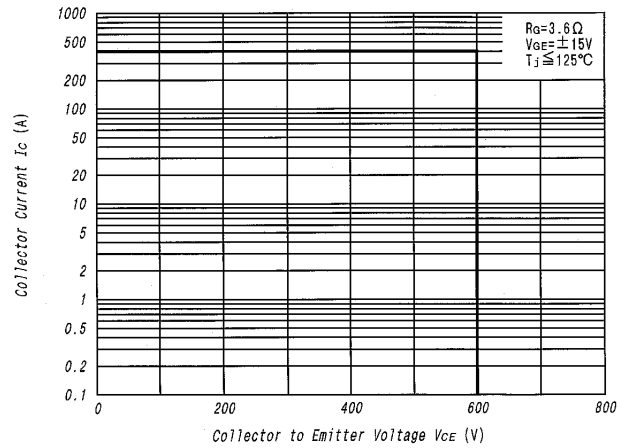


Fig.11 Transient Thermal impedance

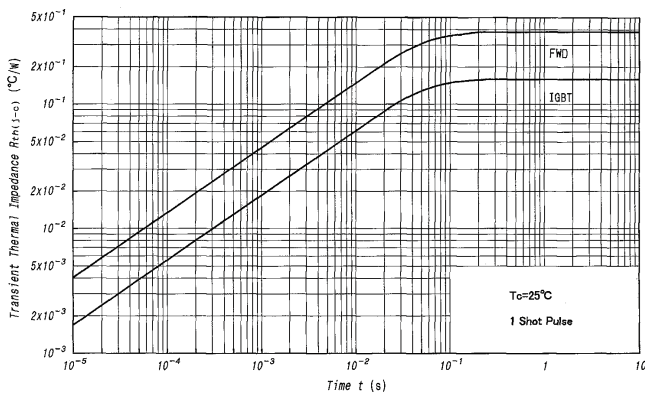
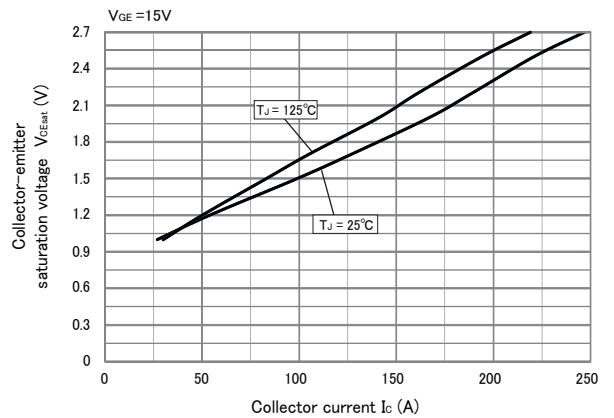


Fig.12 Collector-Emitter Saturation Voltage Characteristics



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