

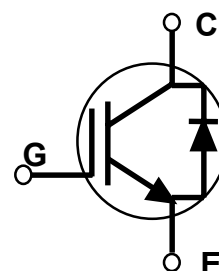
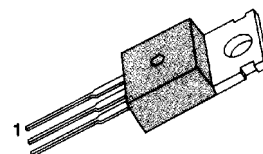
FEATURES

- * Short Circuit rated 10uS @Tc=100℃
- * High Speed Switching
- * Low Saturation Voltage
: $V_{CE(sat)} = 2.0\text{ V @ } I_C=5\text{A}$
- * High Input Impedance
- * CO-PAK, IGBT with FRD
: $T_{rr} = 37\text{ nS (Typ.)}$

APPLICATIONS

- * AC & DC Motor controls
- * General Purpose Inverters
- * Robotics , Servo Controls
- * Power Supply
- * Lamp Ballast

TO-220



ABSOLUTE MAXIMUM RATINGS

Symbol	Characteristics	Rating	Units
V_{CES}	Collector-Emitter Voltage	600	V
V_{GES}	Gate-Emitter Voltage	± 20	V
I_C	Collector Current @ Tc = 25℃	8	A
	Collector Current @ Tc = 100℃	5	A
$I_{CM(1)}$	Pulsed Collector Current	15	A
I_F	Diode Continuous Forward Current @ Tc = 100℃	8	A
I_{FM}	Diode Maximum Forward Current	56	A
P_D	Maximum Power Dissipation @Tc = 25℃	60	W
	Maximum Power Dissipation @Tc = 100℃	25	W
Tsc	Short Circuit Withstand Time	10	uS
Tj	Operating Junction Temperature	-55 ~ 150	℃
Tstg	Storage Temperature Range	-55 ~ 150	℃
TL	Maximum Lead Temp. For Soldering	300	℃
	Purposes, 1/8" from case for 5 seconds		

Notes: (1) Repetitive rating : Pulse width limited by max. junction temperature

ELECTRICAL CHARACTERISTICS (IGBT PART)

(T_c=25°C, Unless Otherwise Specified)

Symbol	Characteristics	Test Conditions	Min	Typ	Max	Units
BV _{CES}	C - E Breakdown Voltage	V _{GE} = 0V , I _C = 250μA	600	-	-	V
ΔV _{CES} / ΔT _J	Temperature Coeff. of Breakdown Voltage	V _{GE} = 0V , I _C = 1mA	-	0.6	-	V/°C
V _{GE(th)}	G - E threshold voltage	I _C = 5mA , V _{CE} = V _{GE}	5.0	6.0	8.0	V
I _{CES}	Collector cutoff Current	V _{CE} = V _{CES} , V _{GE} = 0V	-	-	250	μA
I _{GES}	G - E leakage Current	V _{GE} = V _{GES} , V _{CE} = 0V	-	-	100	nA
V _{CE(sat)}	Collector to Emitter	I _C =5A, V _{GE} = 15V	-	2.0	2.7	V
	saturation voltage	I _C =8A, V _{GE} = 15V	-	2.5	-	V
C _{ies}	Input capacitance	V _{GE} = 0V , f = 1MHz V _{CE} = 30V	-	337	-	pF
C _{oes}	Output capacitance		-	60	-	pF
C _{res}	Reverse transfer capacitance		-	13	-	pF
t _{d(on)}	Turn on delay time	V _{CC} = 300V , I _C = 5A V _{GE} = 15V R _G = 40 Ω Inductive Load	-	9	-	nS
t _r	Turn on rise time		-	18	-	nS
t _{d(off)}	Turn off delay time		-	46	75	nS
t _f	Turn off fall time		-	140	280	nS
E _{on}	Turn on Switching Loss		-	80	-	μJ
E _{off}	Turn off Switching Loss		-	100	-	μJ
E _{ts}	Total Switching Loss		-	180	270	μJ
T _{sc}	Short Circuit withstand Time	V _{CC} = 300V, V _{GE} = 15V @T _c = 100°C	10	-	-	μS
Q _g	Total Gate Charge	V _{CC} = 300V V _{GE} = 15V I _C = 5A	-	24	36	nC
Q _{ge}	Gate-Emitter Charge		-	7	10	nC
Q _{gc}	Gate-Collector Charge		-	8	12	nC

ELECTRICAL CHARACTERISTICS (DIODE PART)(T_c=25 °C, Unless Otherwise Specified)

Symbol	Characteristics	Test Conditions		Min	Typ	Max	Units
VFM	Diode Forward Voltage	IF=8.0A	Tc =25 °C	-	1.4	1.7	V
			Tc =100 °C	-	1.3	-	
Trr	Diode Reverse Recovery Time		Tc =25 °C	-	37	55	nS
			Tc =100 °C	-	55	-	
Irr	Diode Peak Reverse Recovery Current	IF=8.0A, VR=200V -di/dt=200A/uS	Tc =25 °C	-	3.5	5.0	A
			Tc =100 °C	-	4.5	-	
Qrr	Diode Reverse Recovery Charge		Tc =25 °C	-	65	138	nC
			Tc =100 °C	-	124	-	

THERMAL RESISTANCE

Symbol	Characteristics	Min	Typ	Max	Units
R _{θJC}	Junction-to-Case (IGBT)	-	-	2.0	°C/W
R _{θJC}	Junction-to-Case (DIODE)	-	-	3.5	°C/W
R _{θJA}	Junction-to-Ambient	-	-	80	°C/W
R _{θCS}	Case-to-Sink	-	0.5	-	°C/W

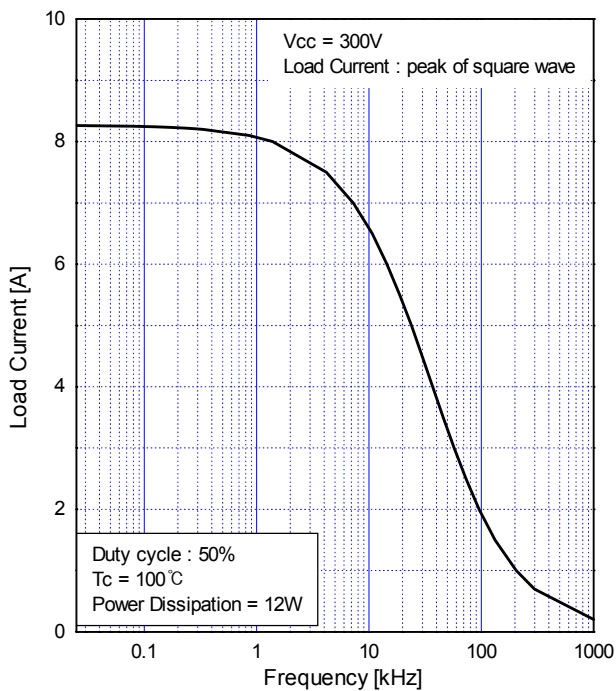


Fig.1 Typical Load Current vs. Frequency

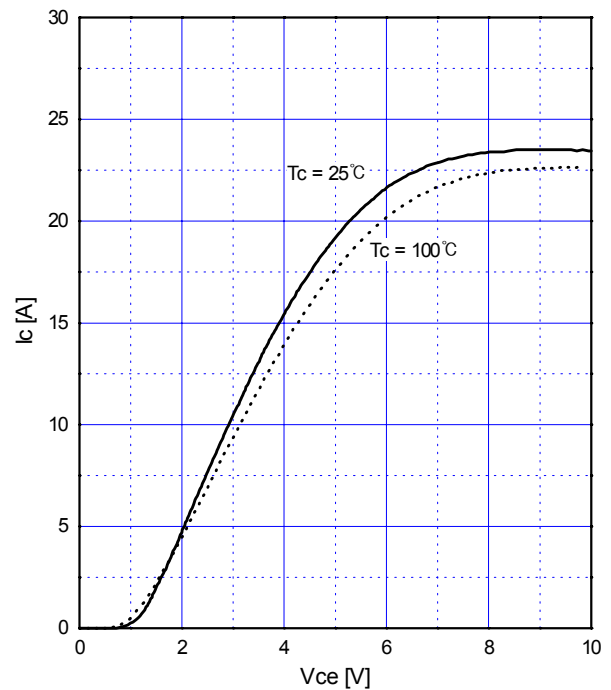


Fig.2 Typical Output Characteristics

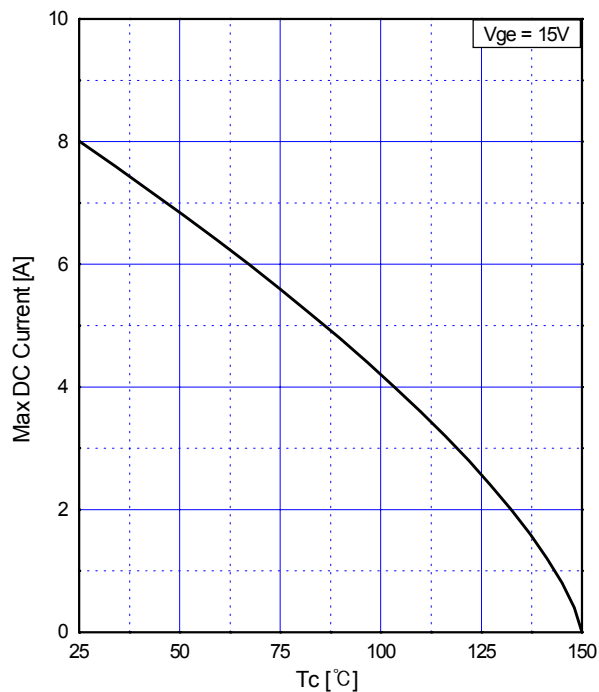


Fig.3 Maximum Collector Current vs. Case Temperature

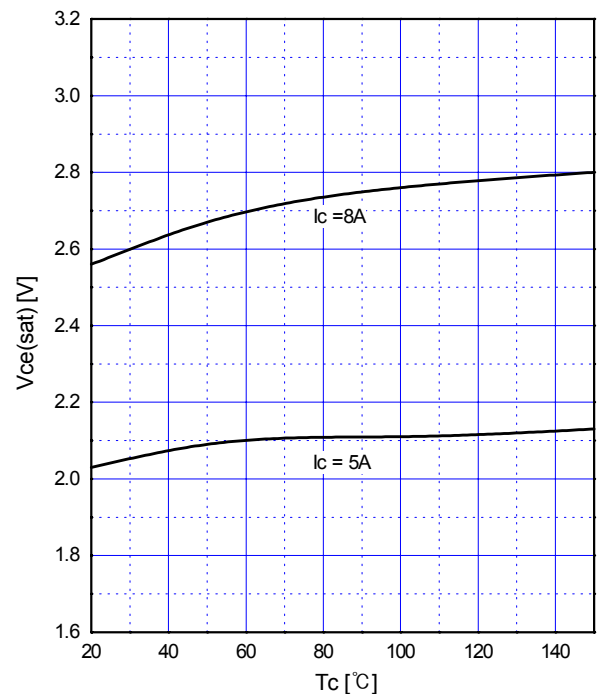


Fig.4 Collector to Emitter Voltage vs. Case Temperature

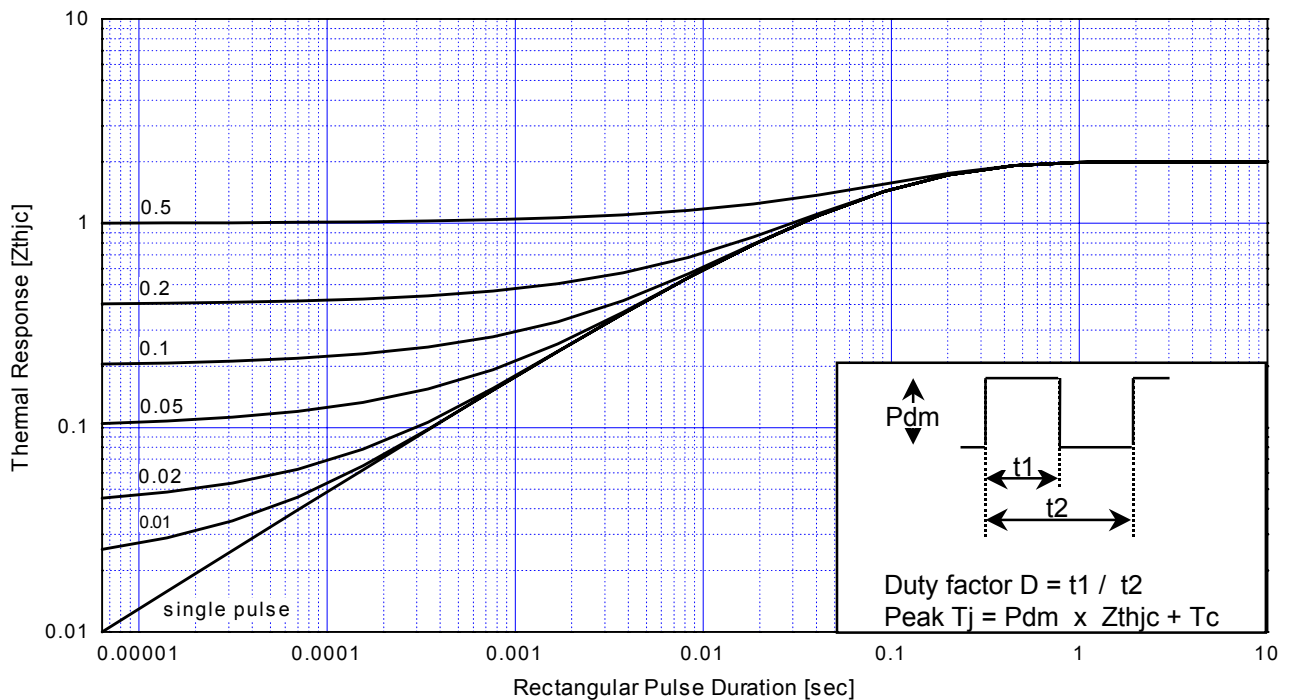
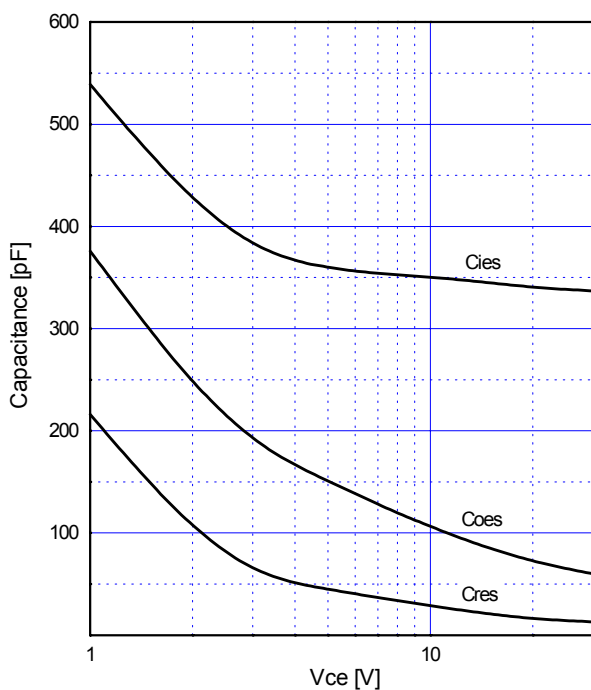
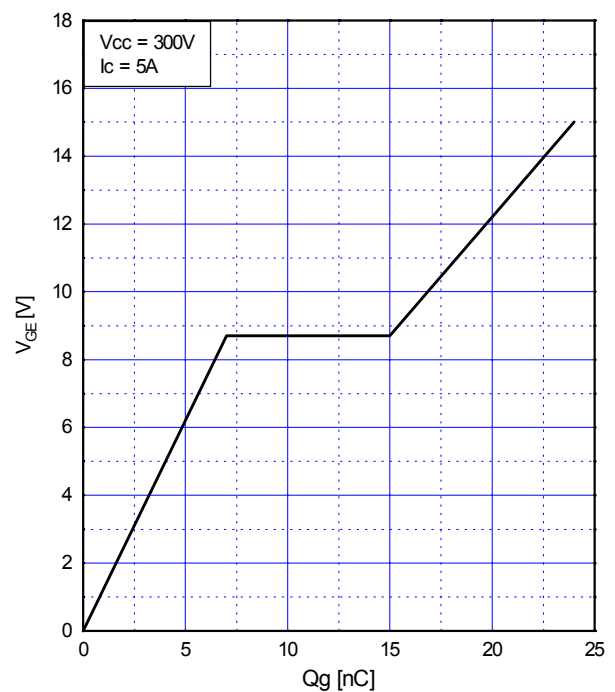


Fig.5 Maximum Effective Transient Thermal Impedance, Junction to Case

Fig.6 Typical Capacitance vs.
Collector to Emitter VoltageFig.7 Typical Gate Charge vs.
Gate to Emitter Voltage

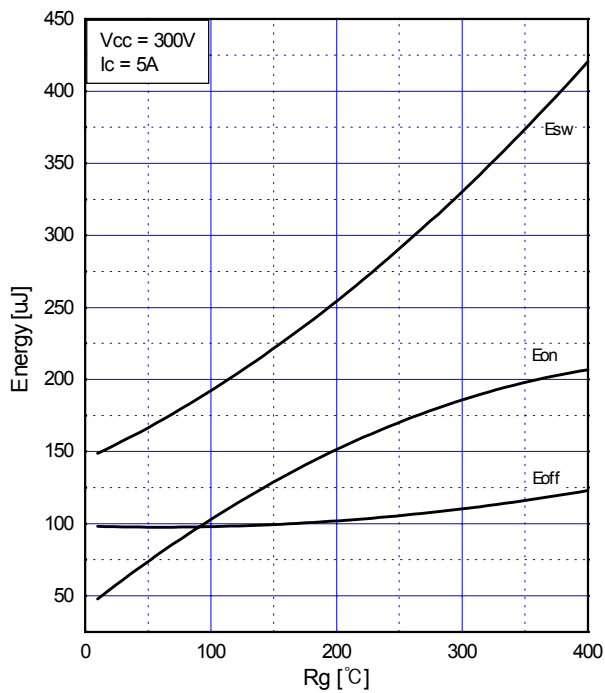


Fig.8 Typical Switching Loss vs. Gate Resistance

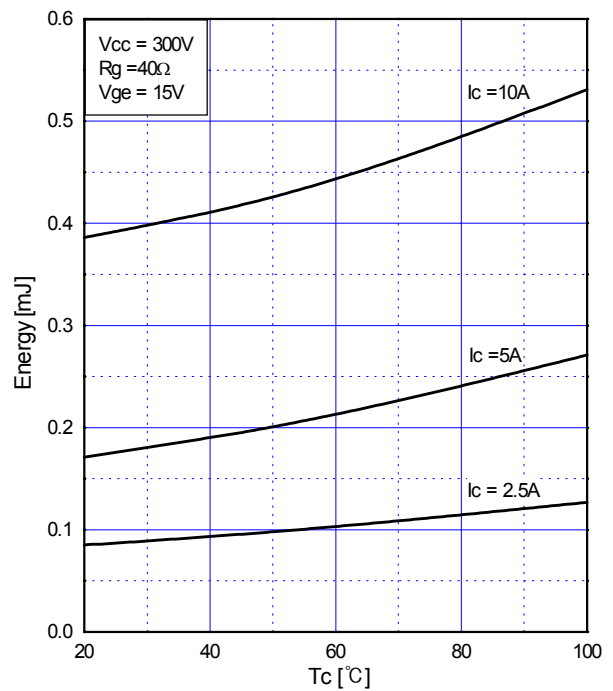


Fig.9 Typical Switching Loss vs. Case Temperature

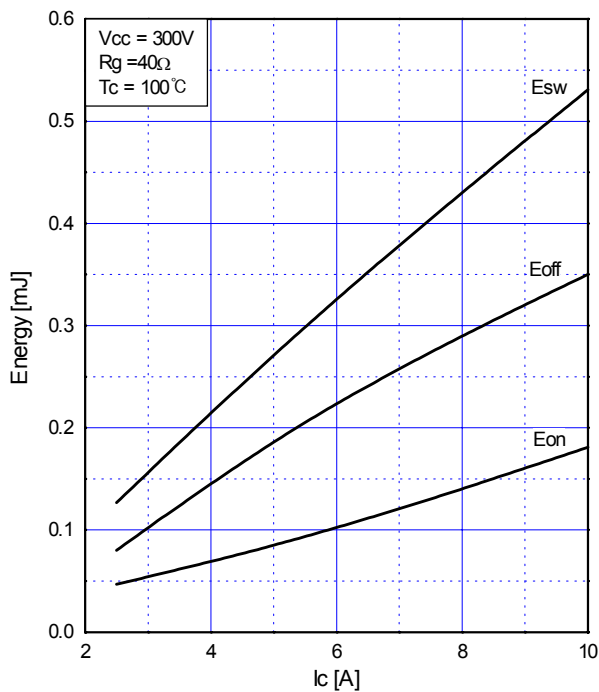


Fig.10 Typical Switching loss vs. Collector to Emitter Current

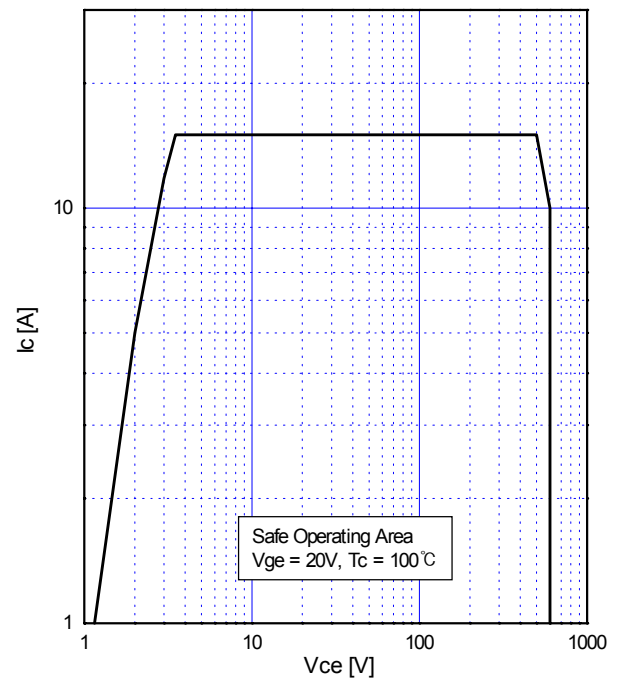


Fig.11 Turn-off SOA

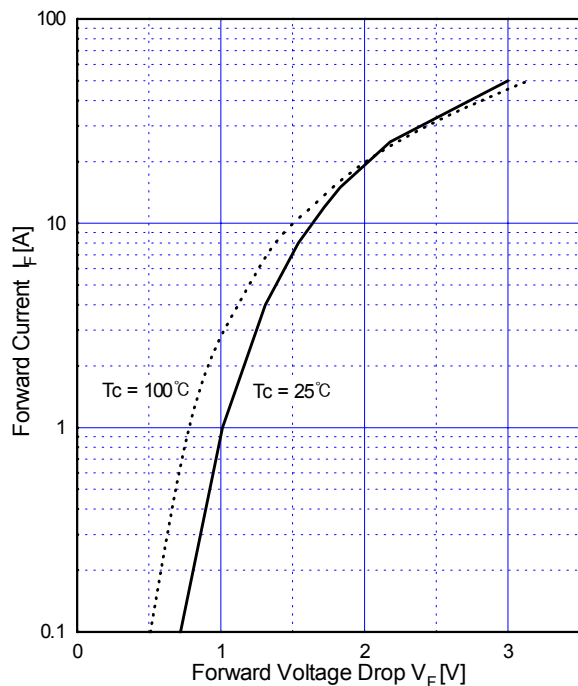
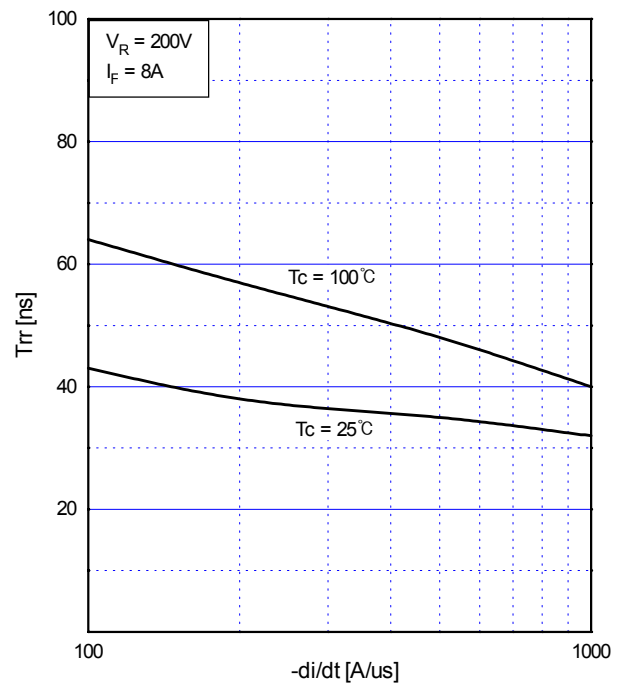
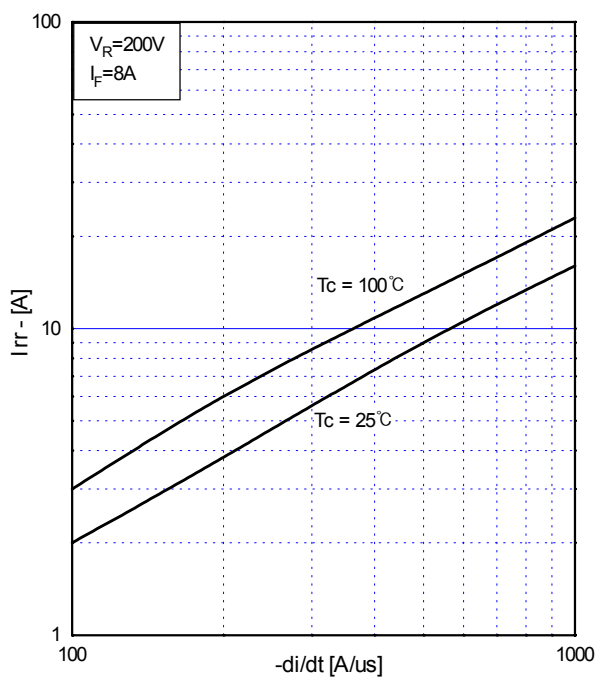
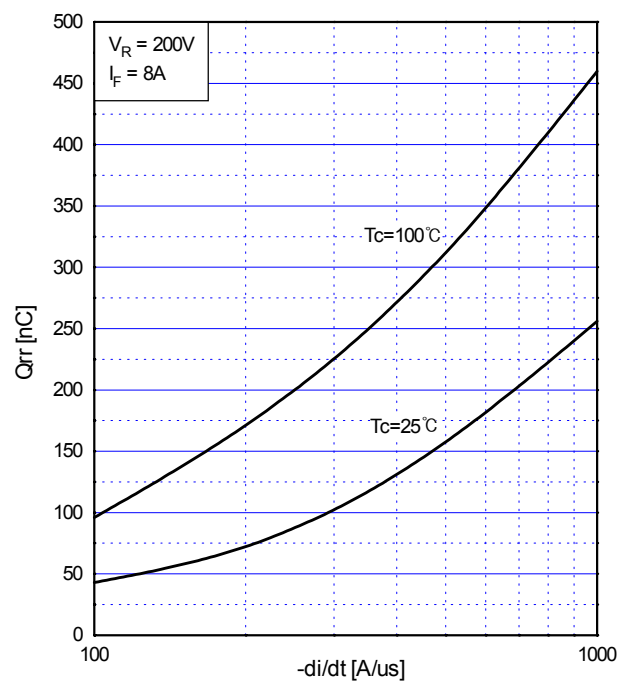


Fig.12 Typical Forward Voltage Drop vs. Forward Current

Fig.13 Typical Reverse Recovery Time vs. di/dt Fig.14 Typical Reverse Recovery Current vs. di/dt Fig.15 Typical Stored Charge vs. di/dt