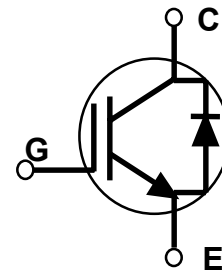
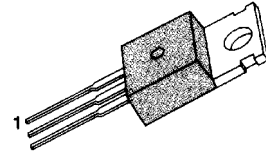


FEATURES

- * Short Circuit rated 10uS @Tc=100°C
- * High Speed Switching
- * Low Saturation Voltage
: $V_{CE(sat)} = 2.1\text{ V @ } I_C=10\text{A}$
- * High Input Impedance
- * CO-PAK, IGBT with FRD
: $T_{rr} = 50\text{ns (Typ)}$

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°C	16	A
	Collector Current @ Tc = 100°C	10	A
$I_{CM(1)}$	Pulsed Collector Current	30	A
I_F	Diode Continuous Forward Current @ Tc = 100°C	12	A
I_{FM}	Diode Maximum Forward Current	92	A
P_D	Maximum Power Dissipation @Tc = 25°C	75	W
	Maximum Power Dissipation @Tc = 100°C	30	W
Tsc	Short Circuit Withstand Time	10	uS
Tj	Operating Junction Temperature	-55 ~ 150	°C
Tstg	Storage Temperature Range	-55 ~ 150	°C
TL	Maximum Lead Temp. For Soldering	300	°C
	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)

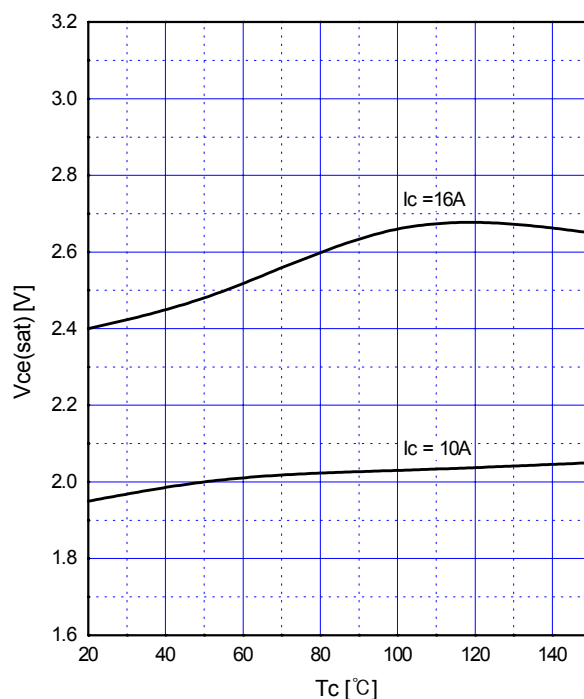
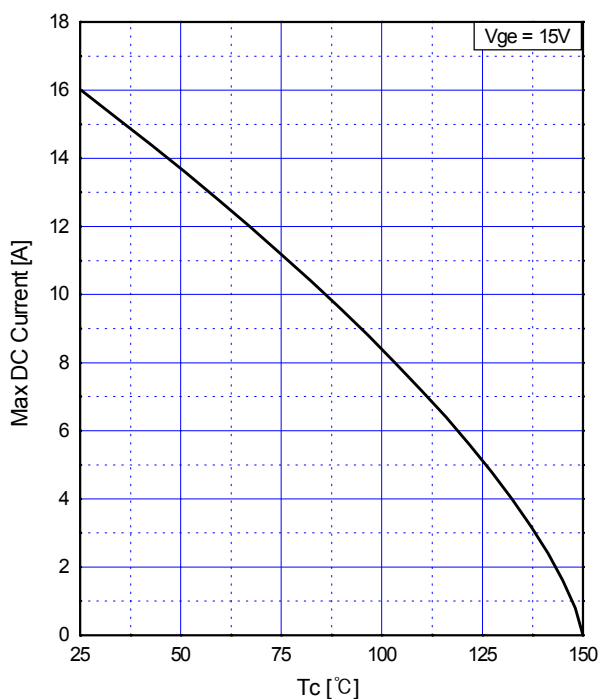
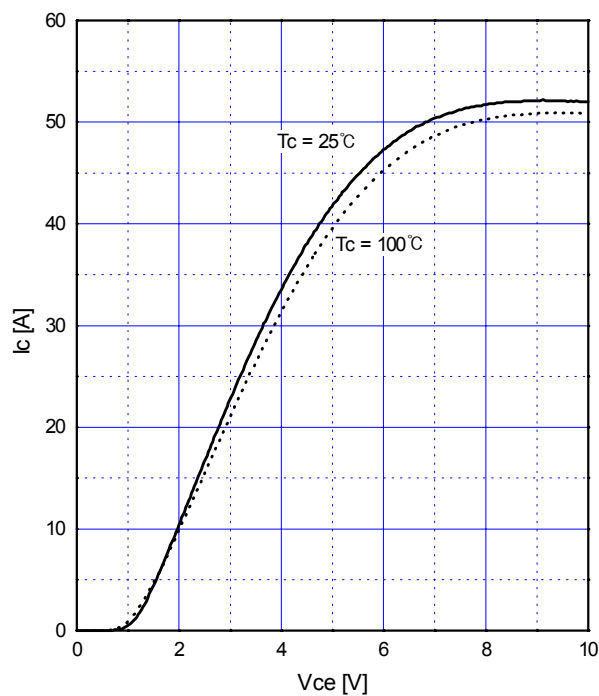
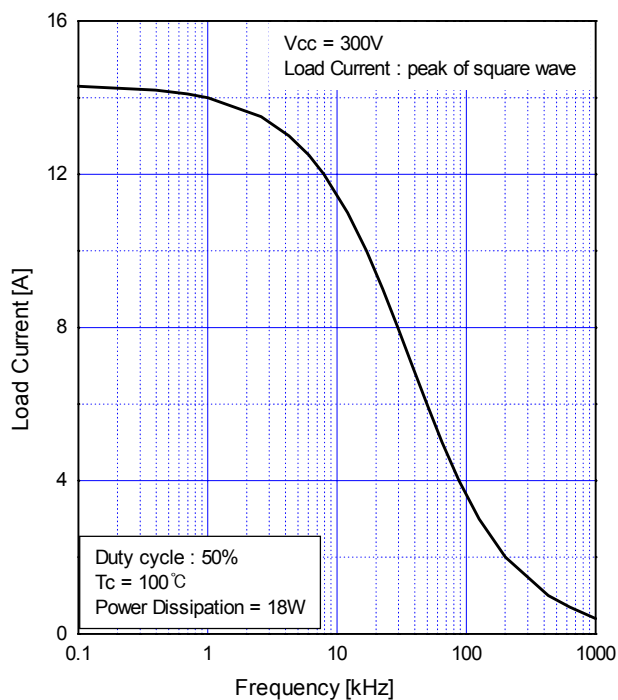
Symbol	Characteristics	Test Conditions	Min	Typ	Max	Units
BV _{CES}	C - E Breakdown Voltage	V _{GE} = 0V , I _C = 250μA	600	-	-	V
ΔV _{CES} / ΔT _J	Temperature Coeff. of Breakdown Voltage	V _{GE} = 0V , I _C = 1mA	-	0.6	-	V/°C
V _{GE(th)}	G - E threshold voltage	I _C = 10mA , V _{CE} = V _{GE}	5.0	6.0	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 = 10A, V _{GE} = 15V	-	2.1	2.7	V
	saturation voltage	I _C = 16A, V _{GE} = 15V	-	2.4	-	V
C _{ies}	Input capacitance	V _{GE} = 0V , f = 1MHz V _{CE} = 30V	-	665	-	pF
C _{oes}	Output capacitance		-	107	-	pF
C _{res}	Reverse transfer capacitance		-	22	-	pF
t _{d(on)}	Turn on delay time	V _{CC} = 300V , I _C = 10A V _{GE} = 15V R _G = 20 Ω Inductive Load	-	10	-	nS
t _r	Turn on rise time		-	17	-	nS
t _{d(off)}	Turn off delay time		-	52	80	nS
t _f	Turn off fall time		-	110	220	nS
E _{on}	Turn on Switching Loss		-	0.1	-	mJ
E _{off}	Turn off Switching Loss		-	0.2	-	mJ
E _{ts}	Total Switching Loss		-	0.3	0.5	mJ
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 = 10A	-	44	66	nC
Q _{ge}	Gate-Emitter Charge		-	10	15	nC
Q _{gc}	Gate-Collector Charge		-	15	22	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=12A	Tc =25 °C	-	1.4	1.7	V
			Tc =100 °C	-	1.3	-	
Trr	Diode Reverse Recovery Time	IF=12A, VR=200V -di/dt=200A/uS	Tc =25 °C	-	50	75	nS
			Tc =100 °C	-	75	-	
Irr	Diode Peak Reverse Recovery Current		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)	-	-	1.6	°C/W
R _{θJC}	Junction-to-Case (DIODE)	-	-	2.5	°C/W
R _{θJA}	Junction-to-Ambient	-	-	80	°C/W
R _{θCS}	Case-to-Sink	-	0.5	-	°C/W



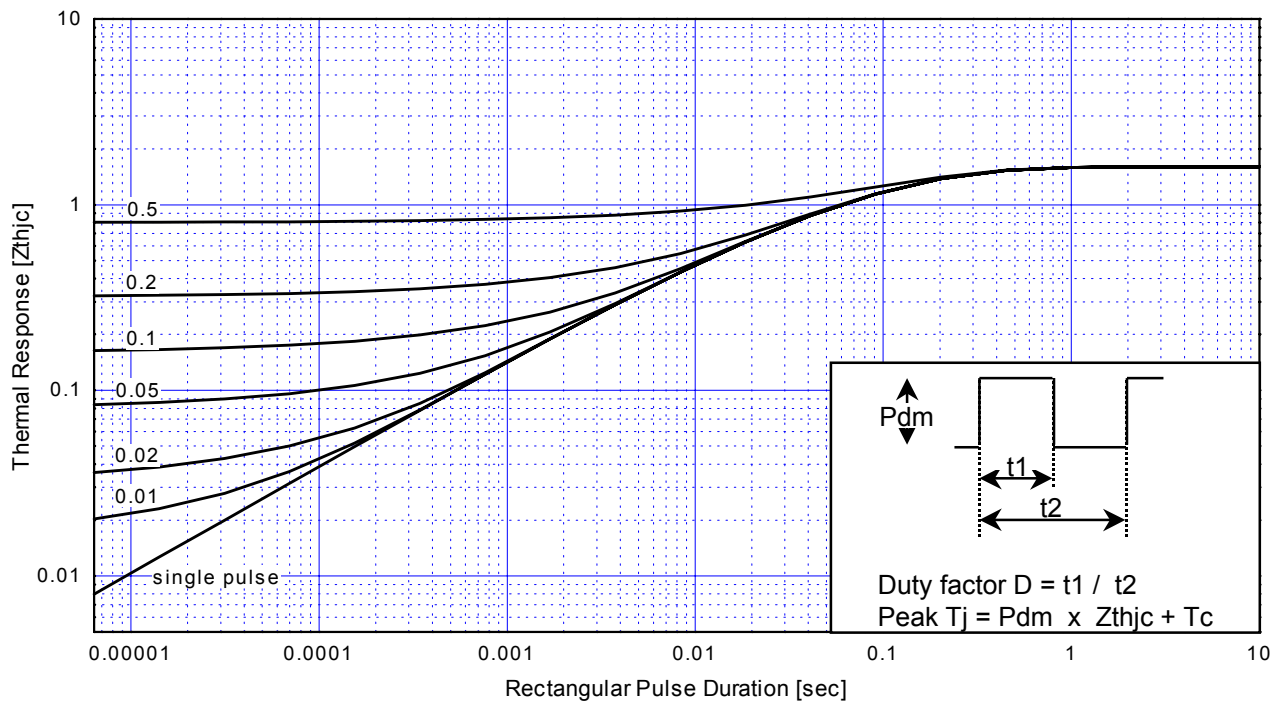


Fig.5 Maximum Effective Transient Thermal Impedance, Junction to Case

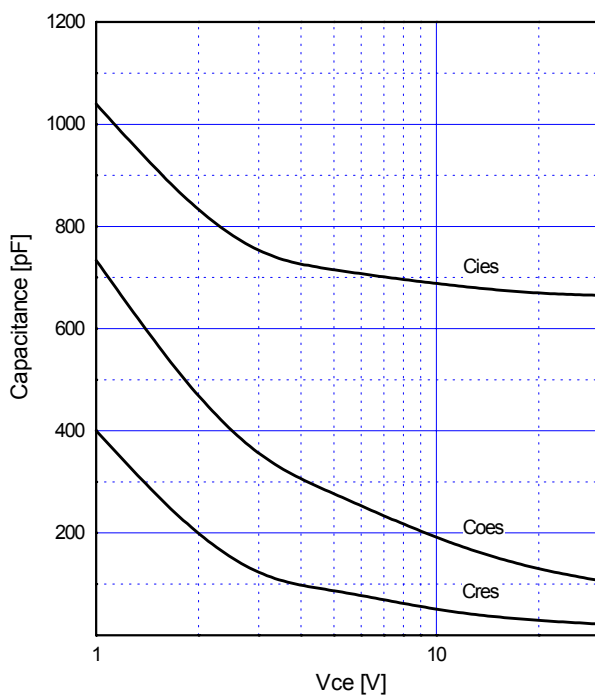


Fig.6 Typical Capacitance vs. Collector to Emitter Voltage

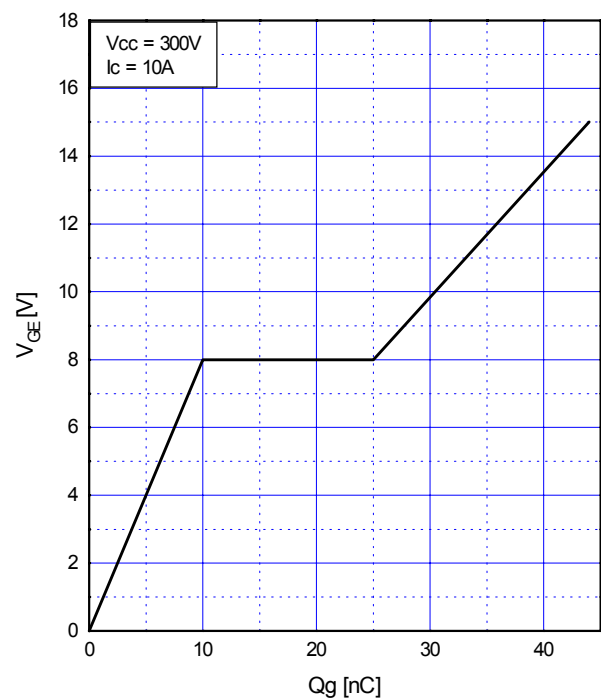


Fig.7 Typical Gate Charge vs. Gate to Emitter Voltage

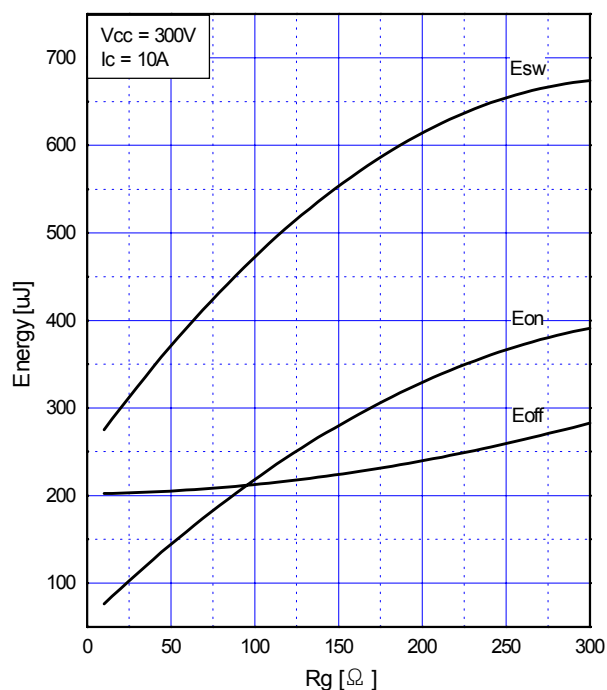


Fig.8 Typical Switching Loss vs. Gate Resistance

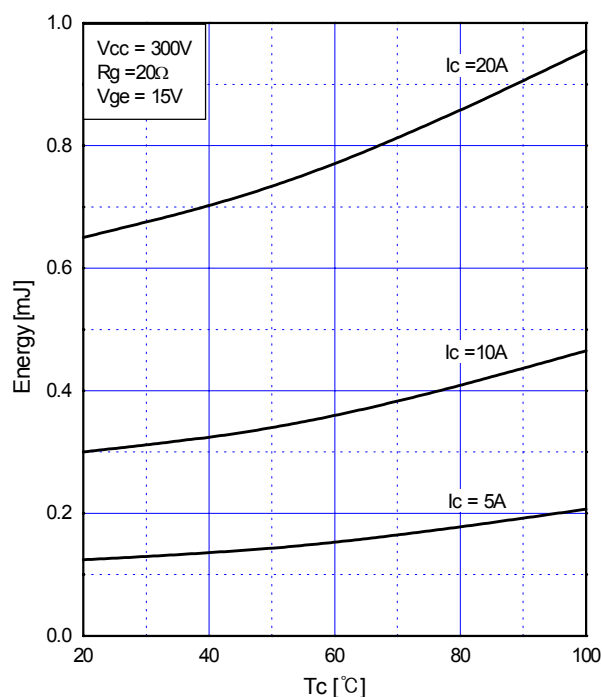


Fig.9 Typical Switching Loss vs. Case Temperature

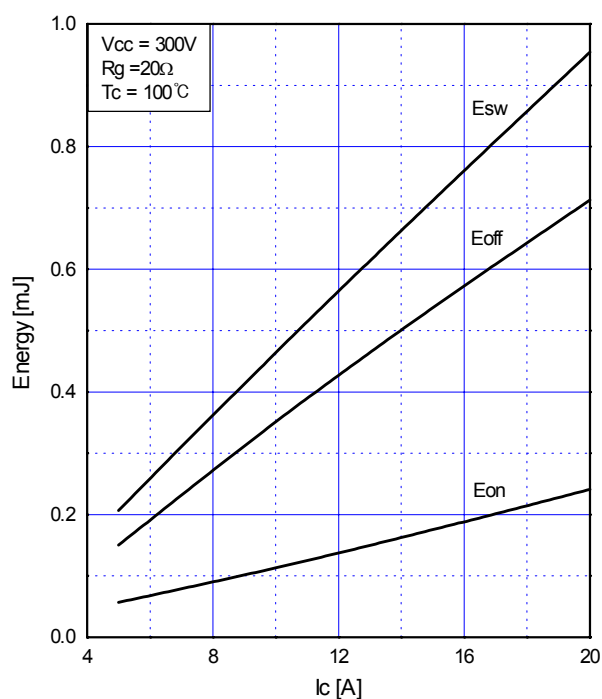


Fig.10 Typical Switching loss vs. Collector to Emitter Current

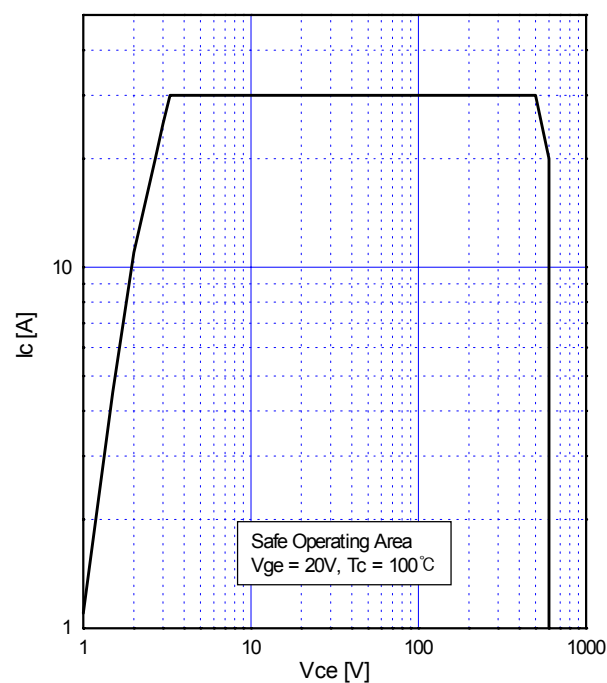


Fig.11 Turn-off SOA

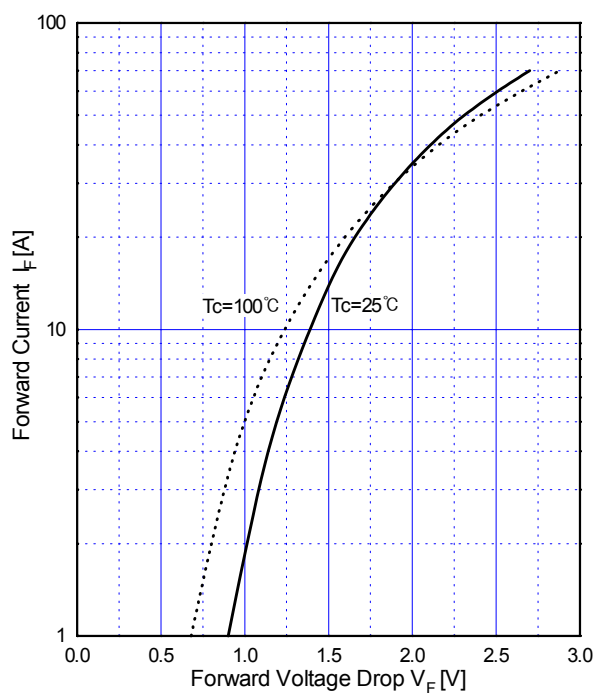


Fig.12 Typical Forward Voltage Drop vs. Forward Current

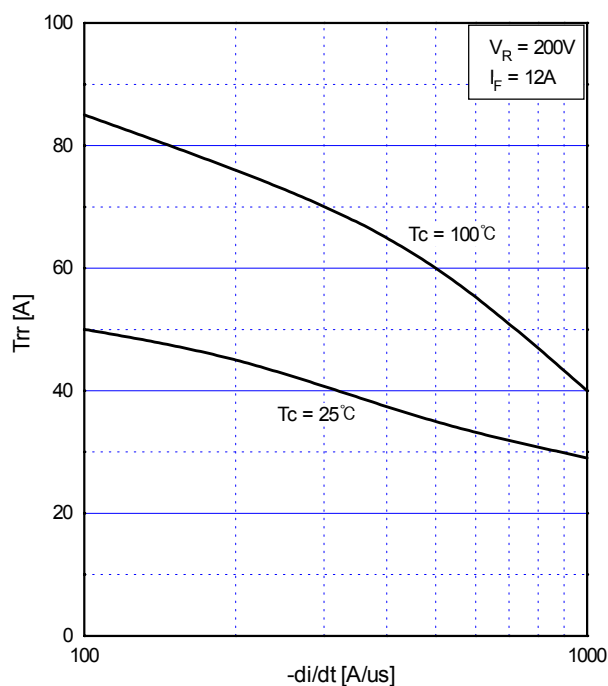


Fig.13 Typical Reverse Recovery Time vs. di/dt

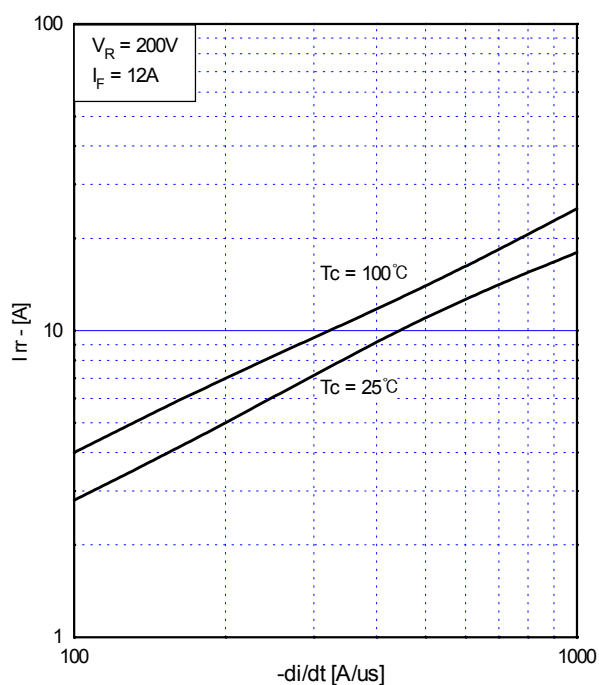


Fig.14 Typical Reverse Recovery Current vs. di/dt

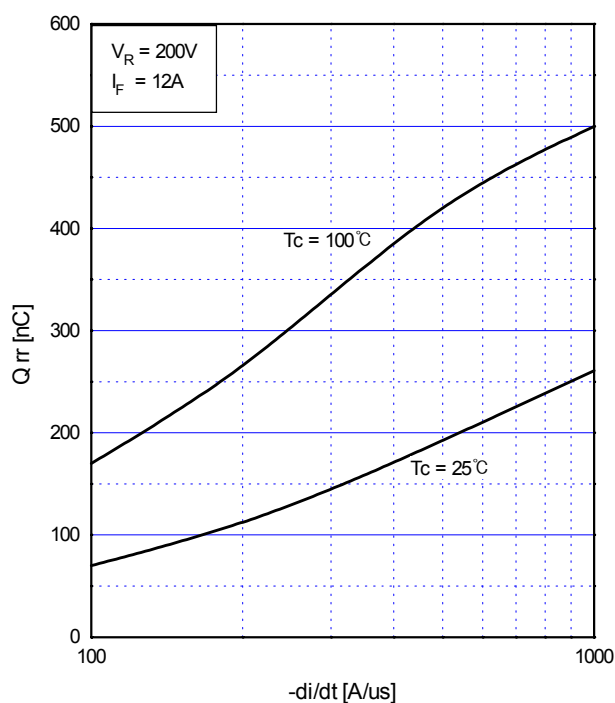


Fig.15 Typical Stored Charge vs. di/dt