

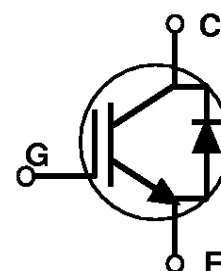
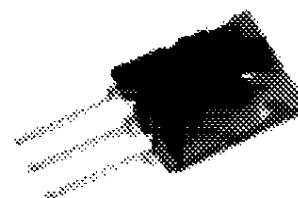
FEATURES

- * Short Circuit rated 10uS @Tc=100°C
- * High Speed Switching
- * Low Saturation Voltage
: $V_{CE(sat)} = 2.0\text{ V @ } I_C=20\text{A}$
- * 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-264



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 @ $T_c = 25^\circ\text{C}$	32	A
	Collector Current @ $T_c = 100^\circ\text{C}$	20	A
$I_{CM(1)}$	Pulsed Collector Current	60	A
I_F	Diode Continuous Forward Current @ $T_c = 100^\circ\text{C}$	25	A
I_{FM}	Diode Maximum Forward Current	220	A
P_D	Maximum Power Dissipation @ $T_c = 25^\circ\text{C}$	190	W
	Maximum Power Dissipation @ $T_c = 100^\circ\text{C}$	75	W
T_{sc}	Short Circuit Withstand Time	10	μS
T_j	Operating Junction Temperature	$-55 \sim 150$	$^\circ\text{C}$
T_{stg}	Storage Temperature Range	$-55 \sim 150$	$^\circ\text{C}$
T_L	Maximum Lead Temp. For Soldering	300	$^\circ\text{C}$
	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)

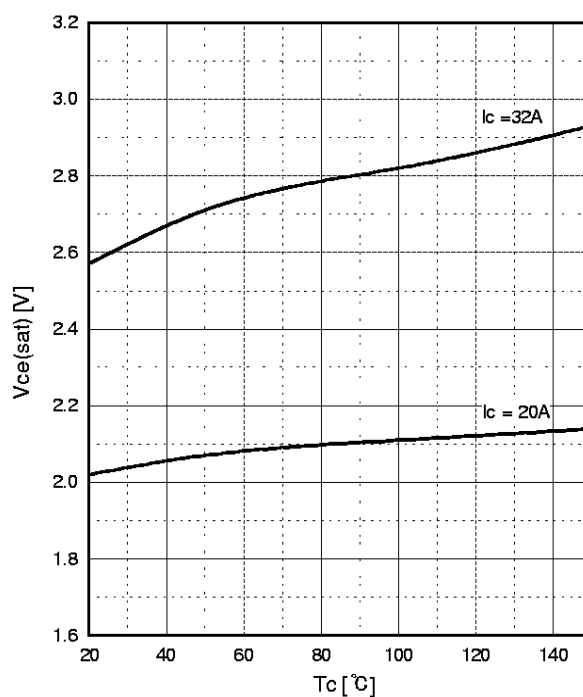
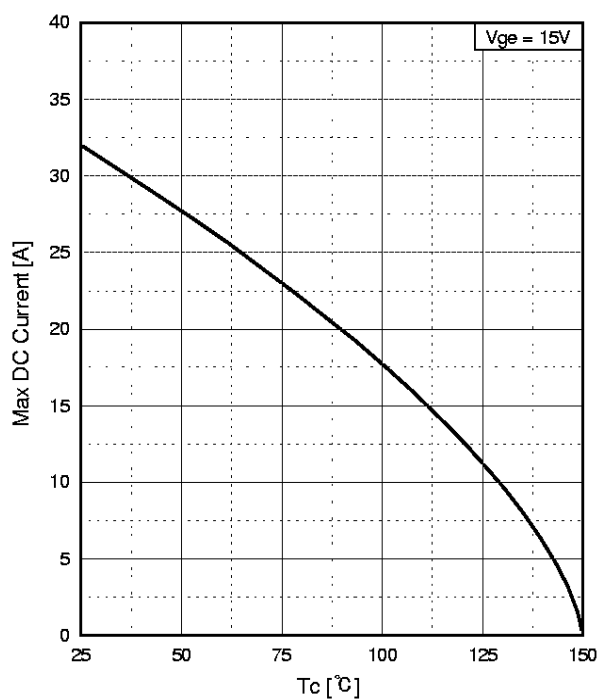
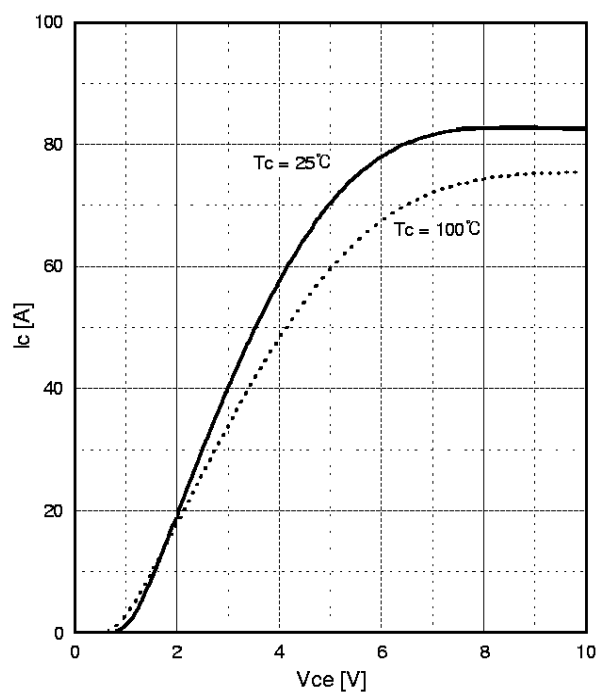
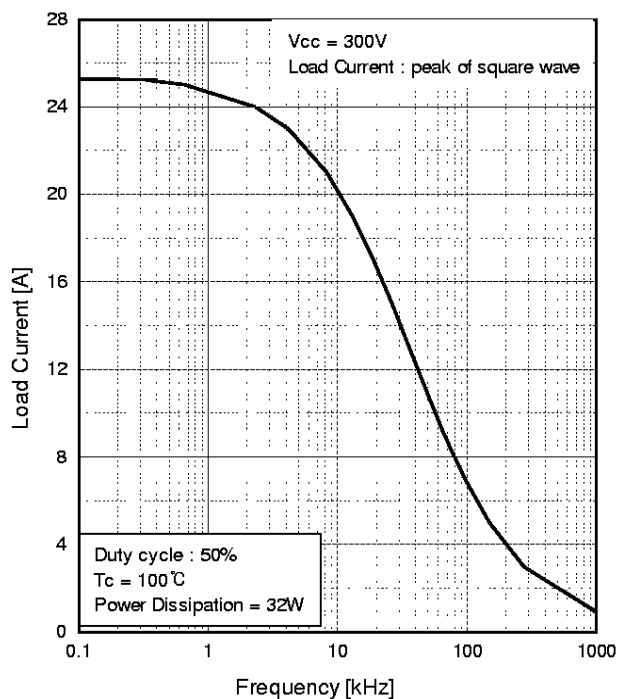
Symbol	Characteristics	Test Conditions	Min	Typ	Max	Units
BV _{CES}	C - E Breakdown Voltage	V _{GE} = 0V , I _C = 250μA	600	-	-	V
ΔV _{CES} / ΔT _J	Temperature Coeff. of Breakdown Voltage	V _{GE} = 0V , I _C = 1mA	-	0.6	-	V/°C
V _{GE(th)}	G - E threshold voltage	I _C = 20mA , V _{CE} = V _{GE}	5.0	6.0	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 saturation voltage	I _C = 20A, V _{GE} = 15V	-	2.0	2.7	V
		I _C = 32A, V _{GE} = 15V	-	2.4	-	V
C _{ies}	Input capacitance	V _{GE} = 0V , f = 1MHz V _{CE} = 30V	-	1260	-	pF
C _{oes}	Output capacitance		-	266	-	pF
C _{res}	Reverse transfer capacitance		-	45	-	pF
t _{d(on)}	Turn on delay time	V _{CC} = 300V , I _C = 20A V _{GE} = 15V R _G = 10Ω Inductive Load	-	18	-	nS
t _r	Turn on rise time		-	22	-	nS
t _{d(off)}	Turn off delay time		-	65	95	nS
t _f	Turn off fall time		-	84	168	nS
E _{on}	Turn on Switching Loss		-	0.1	-	mJ
E _{off}	Turn off Switching Loss		-	0.5	-	mJ
E _{ts}	Total Switching Loss		-	0.6	1.1	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 = 20A	-	83	124	nC
Q _{ge}	Gate-Emitter Charge		-	20	30	nC
Q _{gc}	Gate-Collector Charge		-	32	48	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=25A	Tc =25°C	-	1.4	1.7	V
			Tc =100°C	-	1.3	-	
Trr	Diode Reverse	IF=25A, VR=200V -di/dt=200A/uS	Tc =25°C	-	50	75	nS
	Tc =100°C		-	105	-		
Irr	Diode Peak Reverse		Tc =25°C	-	4.5	10	A
	Recovery Current		Tc =100°C	-	8.5	-	
Qrr	Diode Reverse		Tc =25°C	-	112	375	nC
	Recovery Charge		Tc =100°C	-	420	-	

THERMAL RESISTANCE

Symbol	Characteristics	Min	Typ	Max	Units
R _{θJC}	Junction-to-Case (IGBT)	-	-	0.64	°C/W
R _{θJC}	Junction-to-Case (DIODE)	-	-	0.83	°C/W
R _{θJA}	Junction-to-Ambient	-	-	25	°C/W
R _{θCS}	Case-to-Sink	-	0.2	-	°C/W



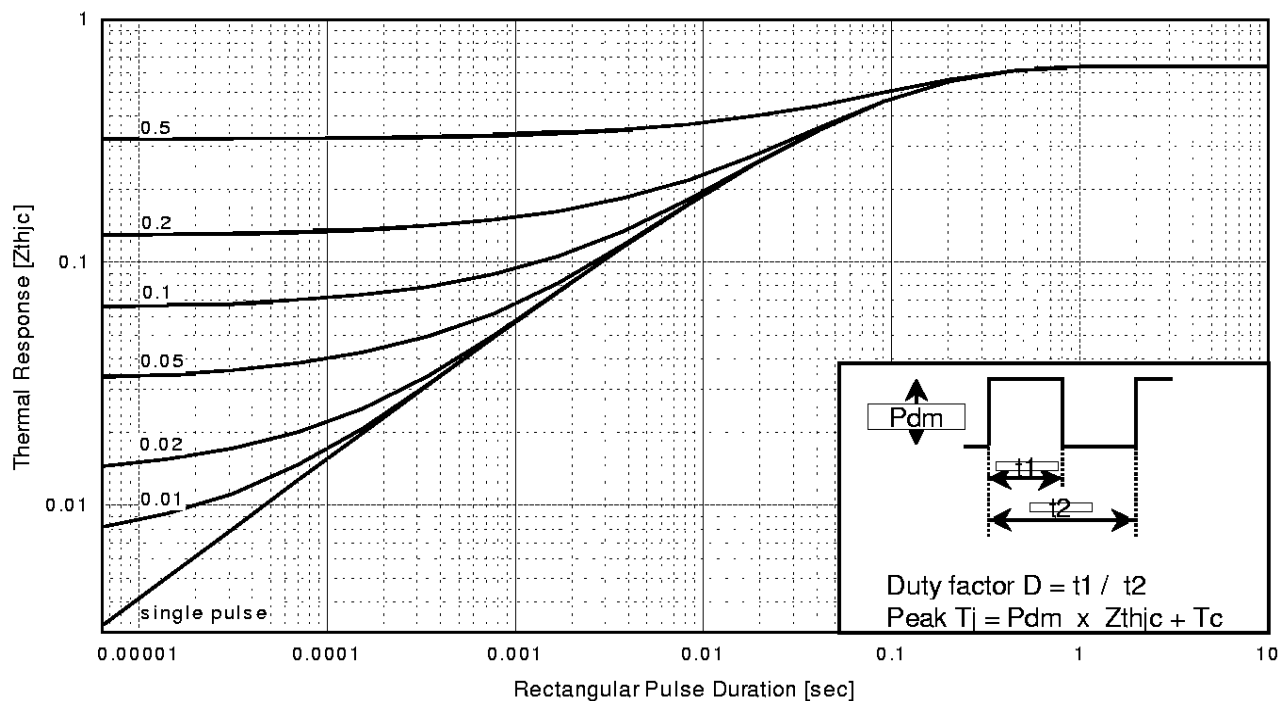


Fig.5 Maximum Effective Transient Thermal Impedance, Junction to Case

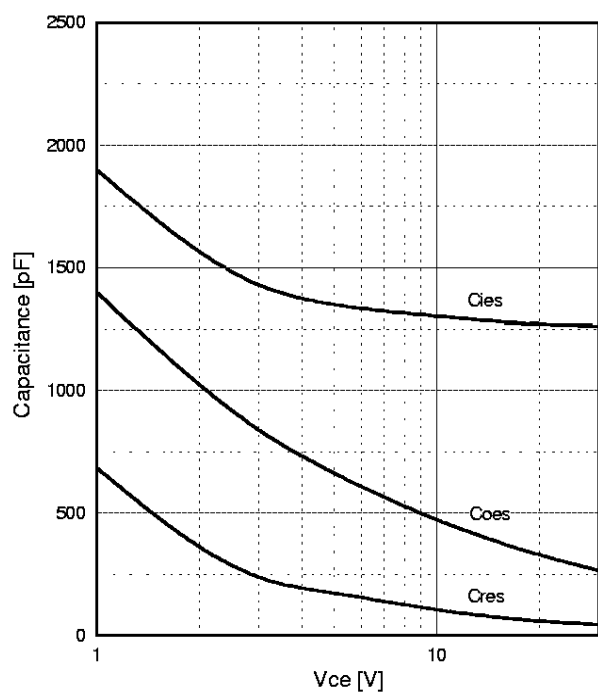


Fig.6 Typical Capacitance vs. Collector to Emitter Voltage

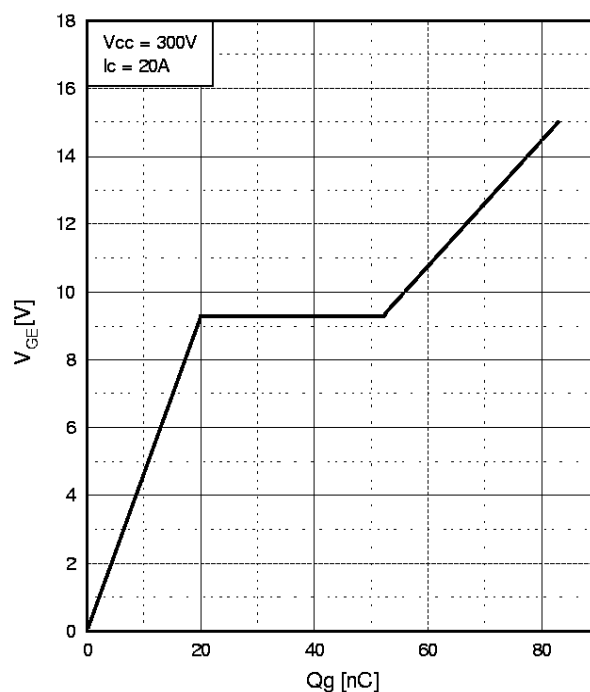


Fig.7 Typical Gate Charge vs. Gate to Emitter Voltage

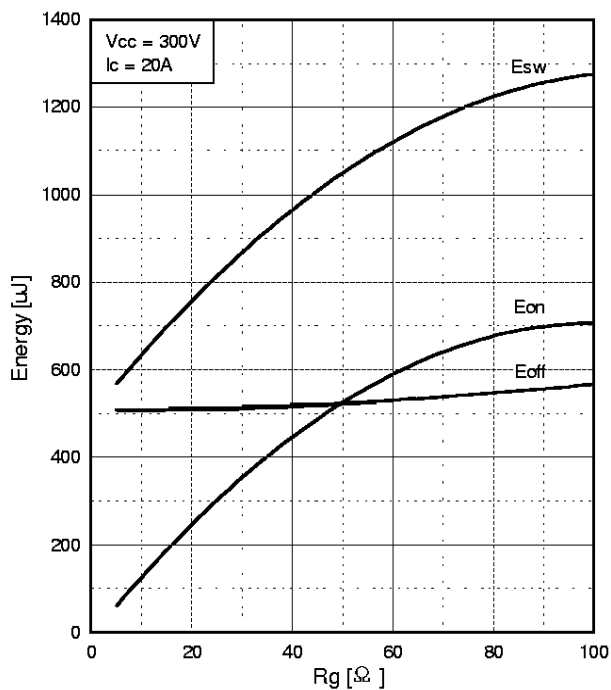


Fig.8 Typical Switching Loss vs. Gate Resistance

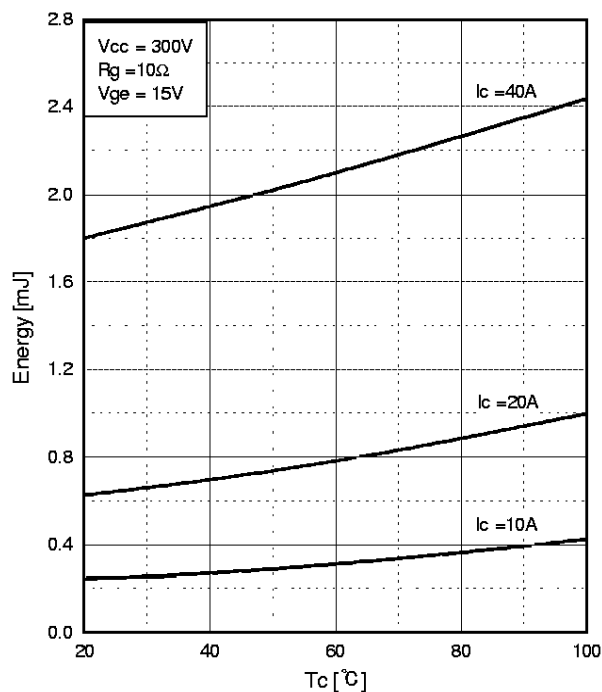


Fig.9 Typical Switching Loss vs. Case Temperature

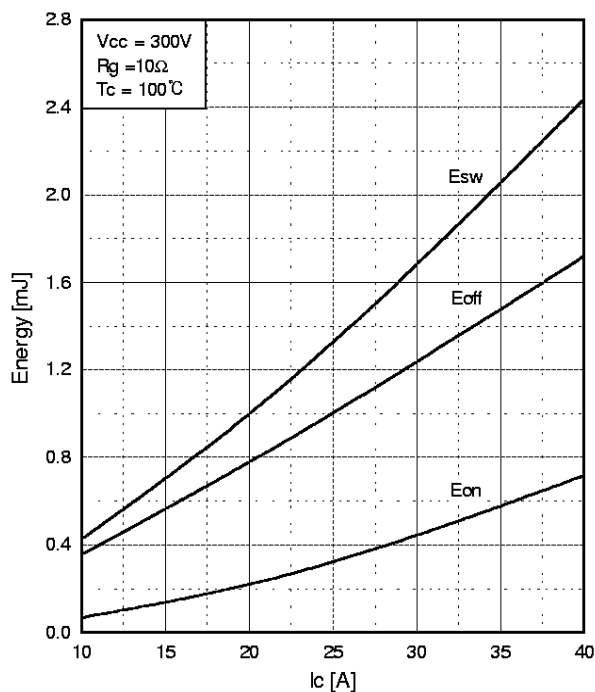


Fig.10 Typical Switching loss vs. Collector to Emitter Current

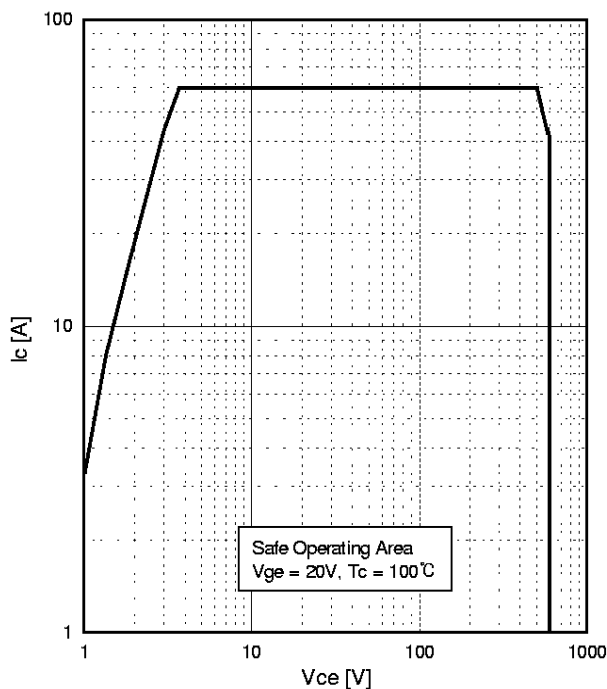


Fig.11 Turn-off SOA

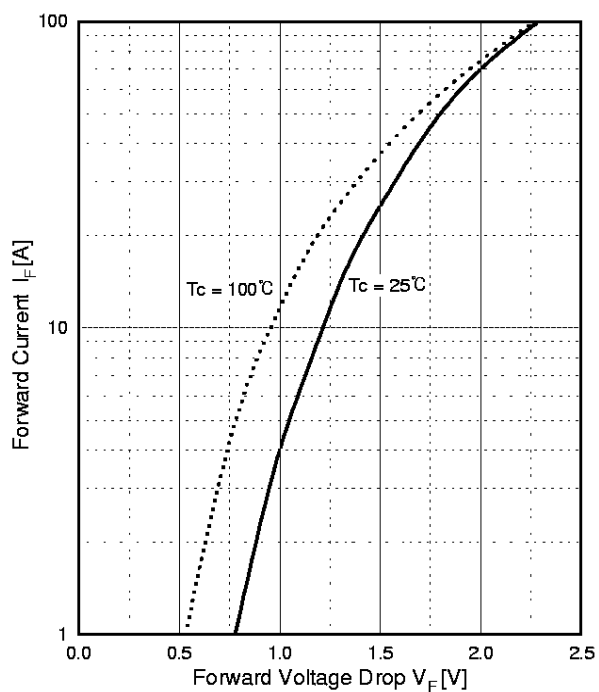


Fig.12 Typical Forward Voltage Drop vs. Forward Current

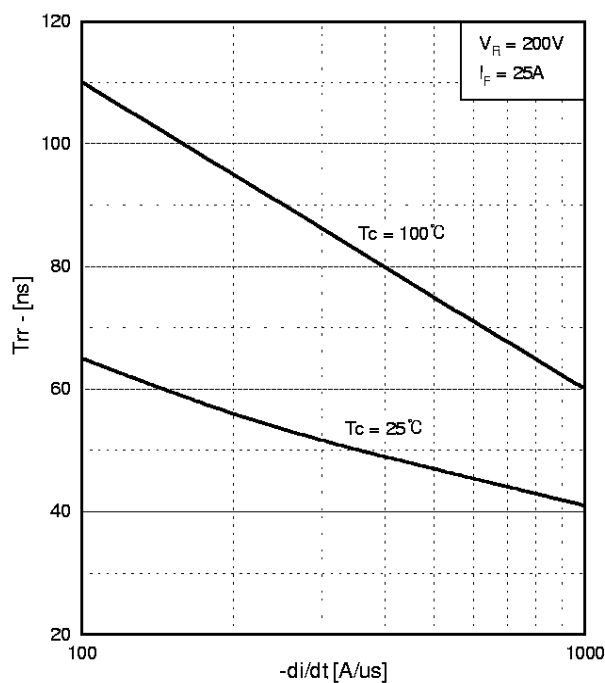


Fig.13 Typical Reverse Recovery Time vs. di/dt

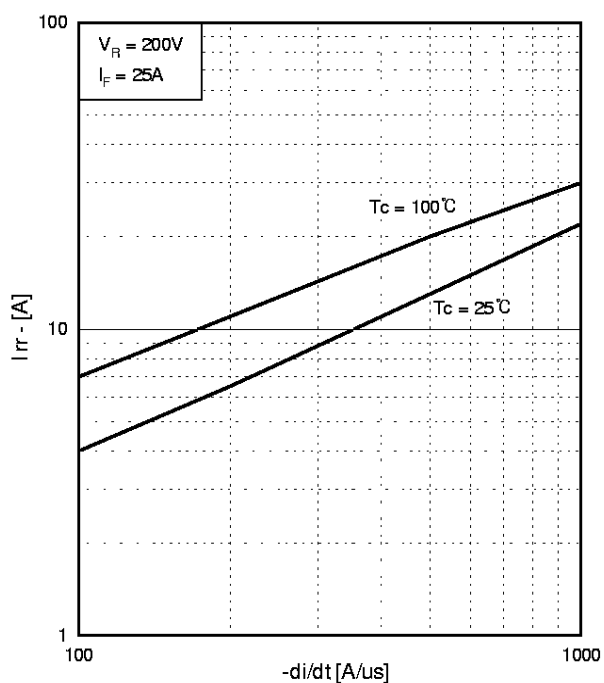


Fig.14 Typical Reverse Recovery Current vs. di/dt

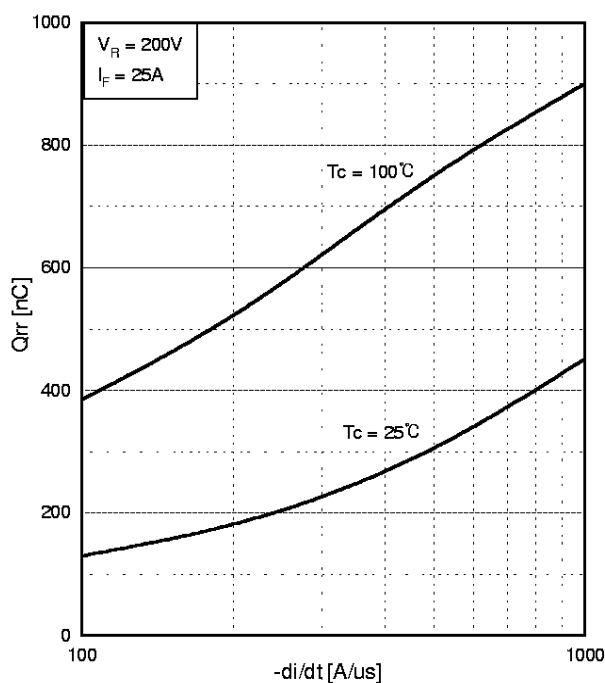


Fig.15 Typical Stored Charge vs. di/dt

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