

GTR Module

Silicon N Channel IGBT

High Power Switching Applications

Motor Control Applications

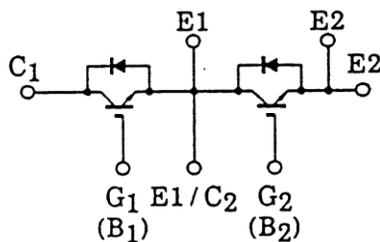
Features

- High input impedance
- High speed: $t_f = 0.30\mu\text{s}$ (Max.) ($I_C = 200\text{A}$)
 $t_{rr} = 0.15\mu\text{s}$ (Max.) ($I_F = 200\text{A}$)
- Low saturation: $V_{CE(sat)} = 2.70$ (Max.) ($I_C = 200\text{A}$)
- Enhancement mode
- The electrodes are isolated from case
- Includes a complete half bridge card in one package

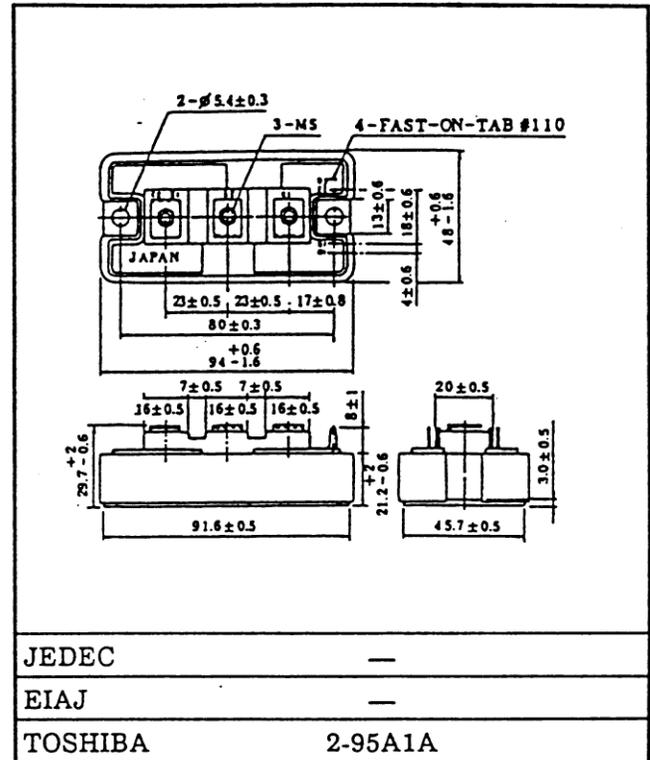
Maximum Ratings ($T_a = 25^\circ\text{C}$)

CHARACTERISTIC		SYMBOL	RATING	UNIT
Collector-Emitter Voltage		V_{CES}	600	V
Gate-Emitter Voltage		V_{GES}	± 20	V
Collector Current	DC	I_C	200	A
	1ms	I_{CP}	400	
Forward Current	DC	I_F	200	A
	1ms	I_{FM}	400	
Collector Power Dissipation ($T_c = 25^\circ\text{C}$)		P_C	900	W
Junction Temperature		T_j	150	$^\circ\text{C}$
Storage Temperature Range		T_{stg}	-40 ~ 125	$^\circ\text{C}$
Isolation Voltage		V_{isol}	2500 (AC 1 min.)	V
Screw Torque (Terminal/Mounting)		-	3/3	N • m

Equivalent Circuit



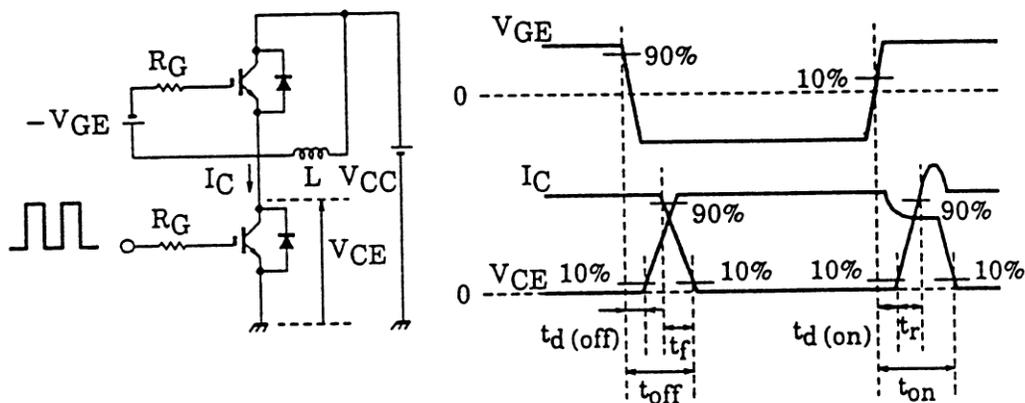
Unit in mm

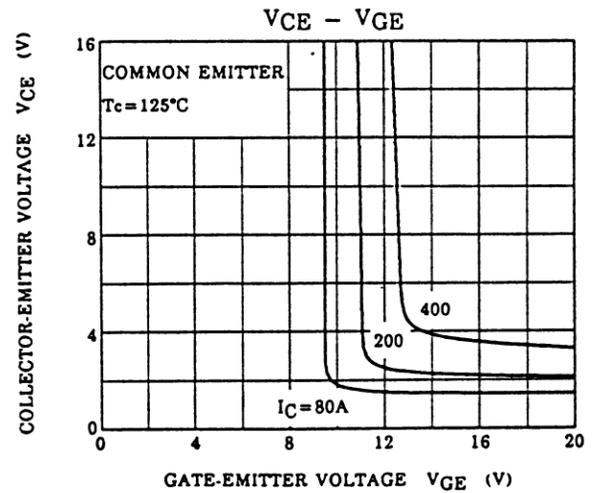
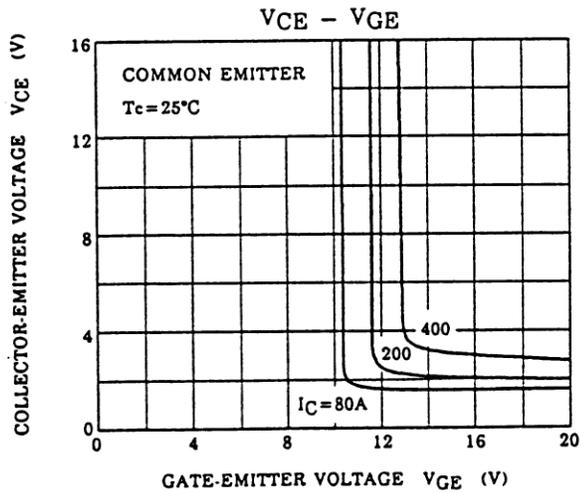
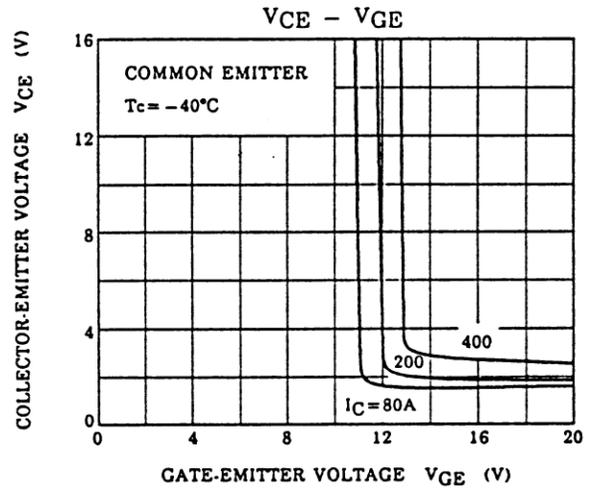
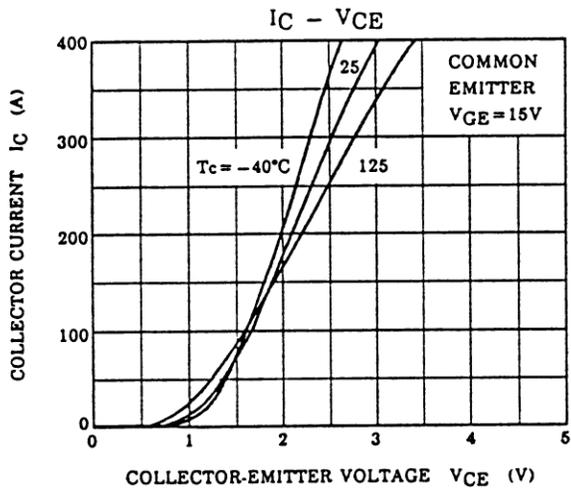
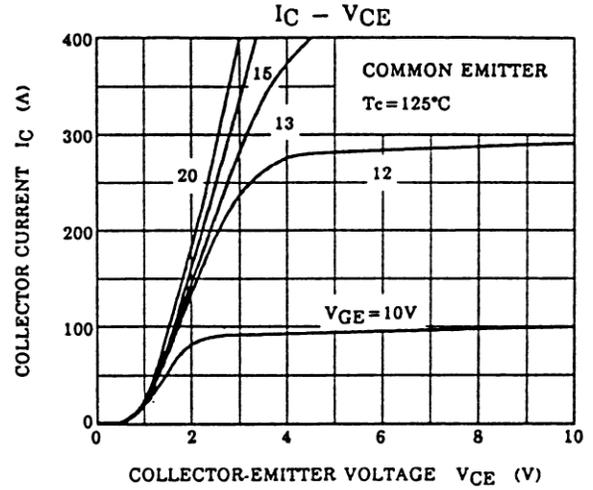
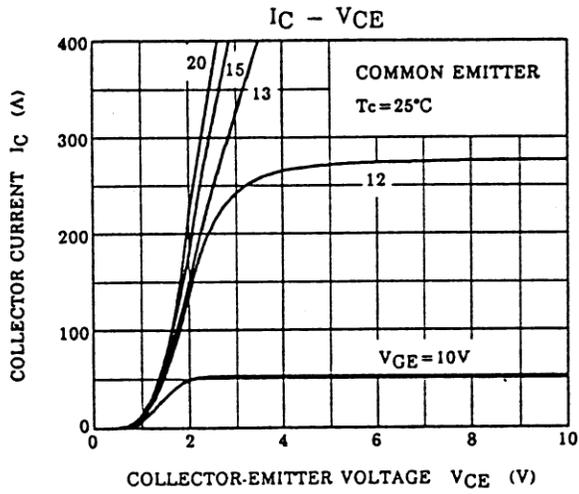


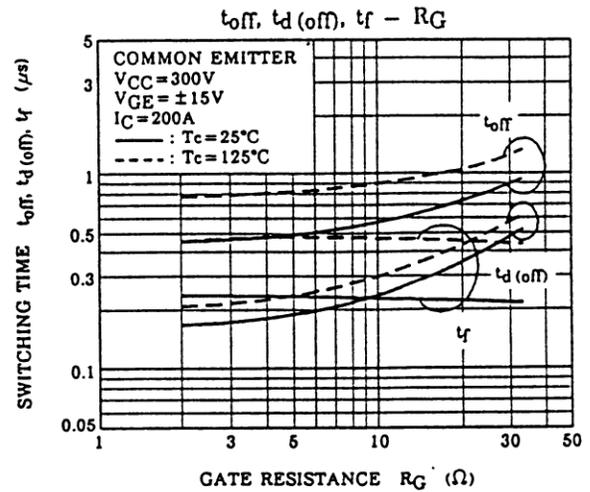
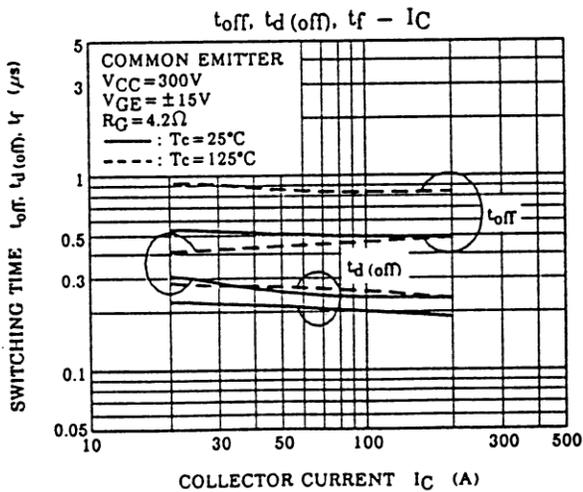
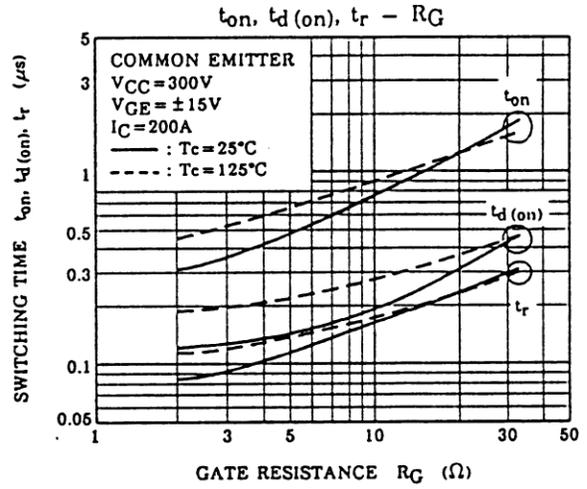
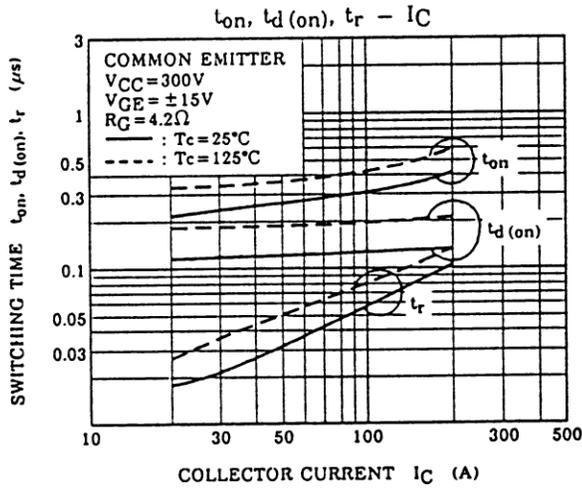
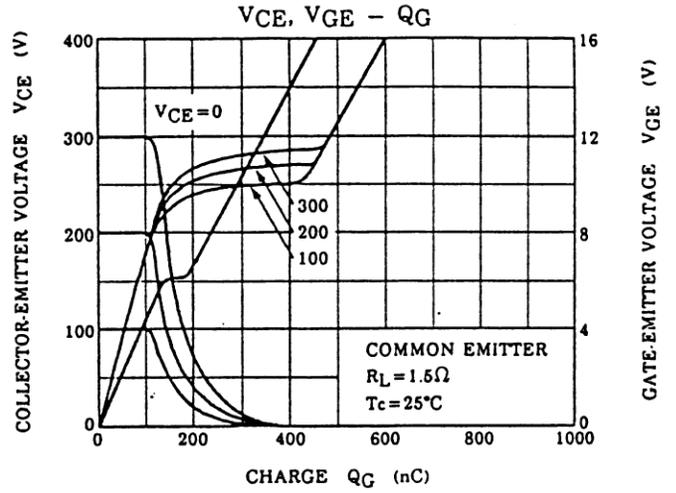
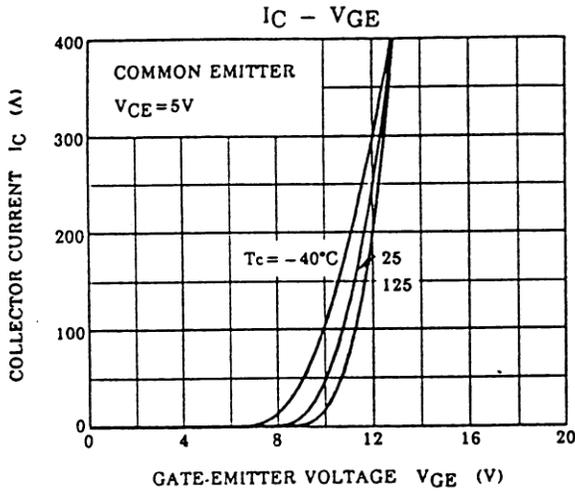
Electrical Characteristics (Ta = 25°C)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Gate Leakage Current	I_{GES}	$V_{GE} = \pm 20V, V_{CE} = 0$	-	-	± 500	nA
Collector Cut-off Current	I_{CES}	$V_{CE} = 600V, V_{GE} = 0$	-	-	2.0	mA
Gate-Emitter Cut-off Voltage	$V_{GE (off)}$	$I_C = 20mA, V_{CE} = 5V$	5.0	7.0	8.0	V
Collector-Emitter Saturation Voltage	$V_{CE (sat)}$	$I_C = 200A, V_{GE} = 15V$	-	2.10	2.70	V
Input Capacitance	C_{ies}	$V_{CE} = 10V, V_{GE} = 0, f = 1MHz$	-	18000	-	pF
Switching Time	Turn-on Delay Time	$t_{d (on)}$	-	0.15	0.30	μs
	Rise Time	t_r	-	0.15	0.30	
	Turn-on Time	t_{on}	-	0.50	1.00	
	Turn-off Delay Time	$t_{d (off)}$	-	0.20	0.40	
	Fall Time	t_f	-	0.15	0.30	
	Turn-off Time	t_{off}	-	0.50	1.00	
Forward Voltage	V_F	$I_F = 200A, V_{GE} = 0$	-	2.30	3.00	V
Reverse Recovery Time	t_{rr}	$I_F = 200A, V_{GE} = -10V$ $di/dt = 200A/\mu s$	-	0.08	0.15	μs
Thermal Resistance	$R_{th (j-c)}$	Transistor	-	-	0.14	$^{\circ}C/W$
		Diode	-	-	0.35	

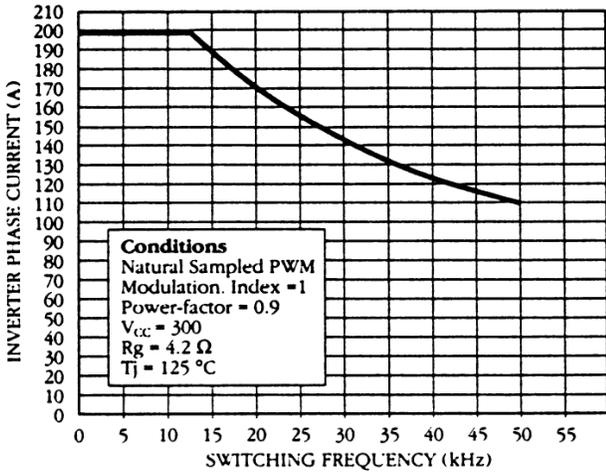
Note 1 Switching Time and Reverse Recovery Time Test Circuit & Timing Chart.



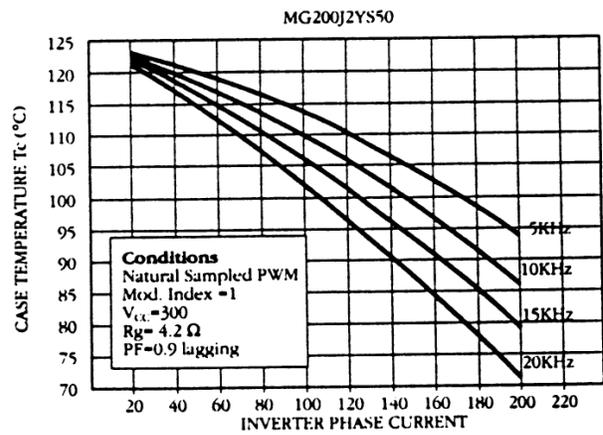
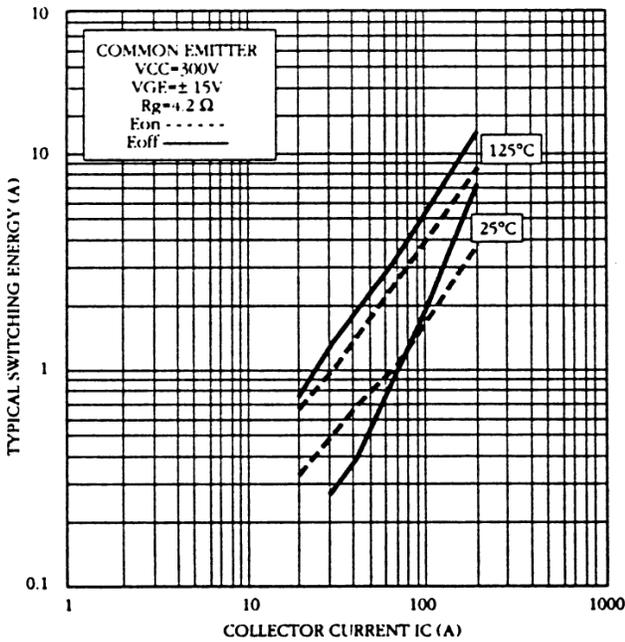


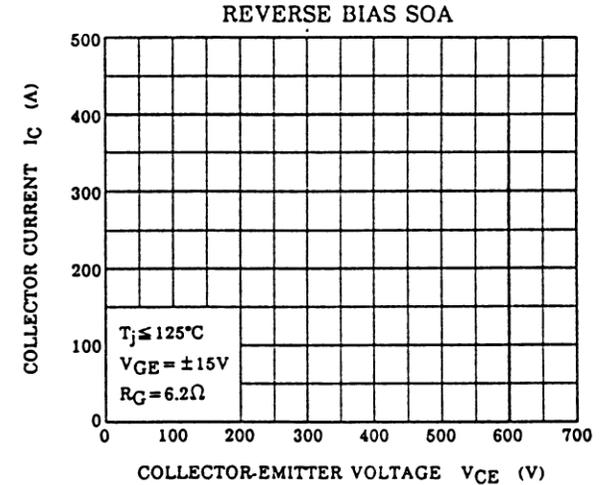
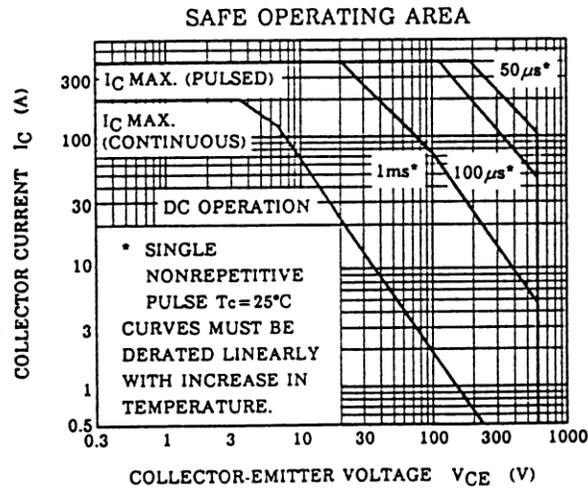
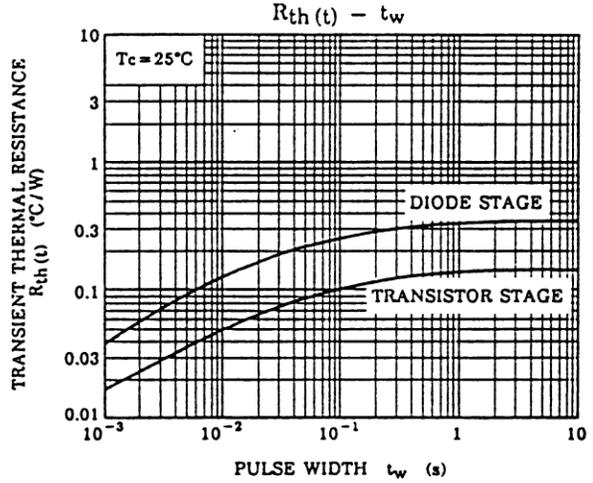
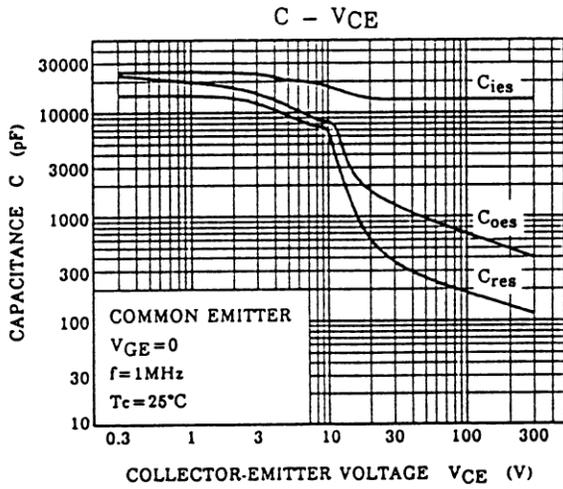
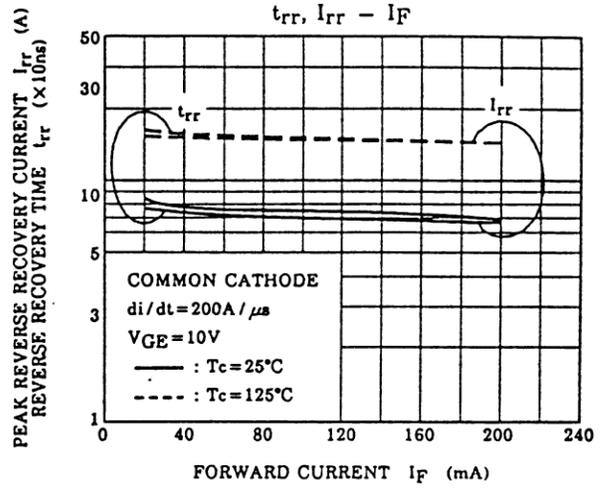
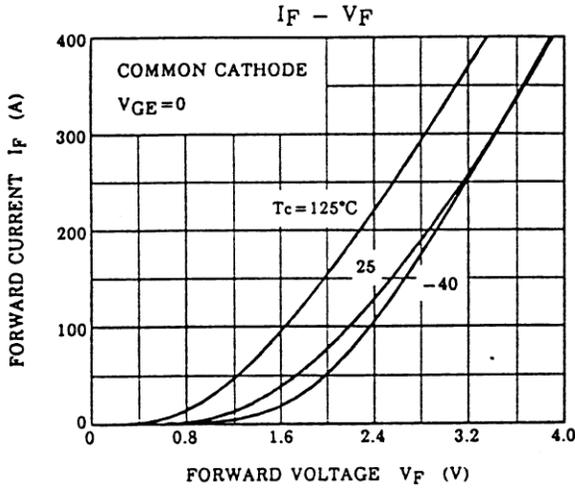


TYPICAL INVERTER PHASE CURRENT AT TCASE = 80 °C



TYPICAL SWITCHING ENERGY (IC)





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