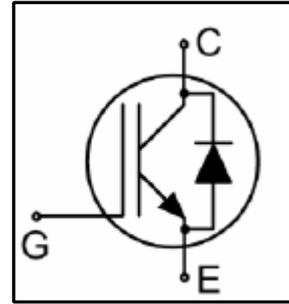


Low Loss IGBT

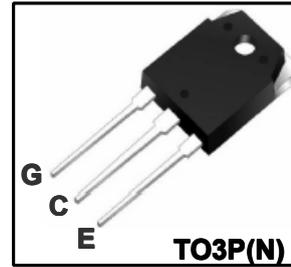
Features

- 15A, 1200V, $V_{CE(sat)}$ (Typ.=2.4v)@ $I_C=15A$ & $T_C=100^\circ C$
- low Gate charge(Typ.= 85nC)
- NPT Technology, Positive temperature coefficient
- Low EMI
- Pb-free lead plating; RoHS compliant



Applications

- General purpose inverter
- Frequency converters
- Induction Heating(IH)
- Uninterrupted Power Supply(UPS)



Absolute Maximum Ratings($T_C=25^\circ C$)

Symbol	Parameter		Value	Unit
V_{CES}	Collector-Emitter Voltage		1200	V
I_C	DC Collector Current	$T_C=25^\circ C$	30	A
		$T_C=100^\circ C$	15	A
I_{CP}	Collector pulse Current	T_p limited by T_J	45	A
V_{GES}	Gate-Emitter Voltage		± 20	V
t_{SC}	Short circuit withstand time	$V_{GE}=10V, V_{CE} \leq 1200V, T_J \leq 150^\circ C$	10	μs
	Turn-off safe area	$V_{CE} \leq 1200V, T_J \leq 150^\circ C$	45	A
P_D	Total Dissipation		150	W
T_J	Operation Junction Temperature		-40 ~ 150	$^\circ C$
T_{STG}	Storage Temperature		-50 ~ 150	$^\circ C$
T_L	Maximum Lead Temperature for Soldering Purposes		300	$^\circ C$

Thermal Characteristics

Symbol	Parameter	Value			Unit
		Min	Typ	Max	
R_{QJC}	Thermal Resistance , Junction -to -Case	-	-	0.6	$^\circ C/W$
R_{QJA}	Thermal Resistance , Junction-to -Ambient	-	-	40	$^\circ C/W$

Electrical Characteristics(Tc=25°C)

Characteristics		Symbol	Test Condition	Min	Typ	Max	Unit
Gate-body leakage current		I_{GES}	$V_{GS}=\pm 30V, V_{CE}=0V$	-	-	± 100	nA
Collector-Emitter Breakdown Voltage		$V_{(BR)CES}$	$I_C=0.5mA, V_{GE}=0V$	1200	-	-	V
Collector-Emitter Saturation Voltage		$V_{CE(sat)}$	$I_C=15A, V_{GE}=15V$		2.4	3.5	V
				Tc=125°C	2.8	-	
				Tc=150°C	3.0	-	
Zero Gate Voltage Collector current		I_{CES}	$V_{CE}=1200V,$ $V_{GE}=0V$		-	0.2	mA
				Tc=100°C	-	2.0	
				Tc=150°C	-	2.5	
Gate threshold voltage		$V_{GE(th)}$	$V_{CE}=V_{GE}, I_D=0.6mA$	4.5	-	6.5	V
Forward Transconductance		g_{fs}	$V_{CE}=20V, I_D=15A$	-	10	-	S
Short Collector Current		$I_C(SC)$	$V_{GE}=15V, V_{CE}=600, t_{sc}<10\mu s$	-	90	-	A
Total Gate Charge		Q_g	$V_{CE}=960V, I_C=15A, V_{GE}=15V$	-	85	-	nC
Input capacitance		C_{iss}	$V_{CE}=25V,$	-	1700	2600	pF
Reverse transfer capacitance		C_{rss}	$V_{GS}=0V,$	-	128	200	
Output capacitance		C_{oss}	$f=1MHz$	-	880	140	
Switching time	Turn-on delay time	$T_d(on)$	$V_{CE}=600V,$ $I_C=15A$ $R_G=56\Omega$	-	25	-	ns
	Turn-on Rise time	t_r		-	60	-	
	Turn-off delay time	$T_d(off)$		-	20	-	
	Turn-off Fall time	t_f		-	95	-	
Turn-on energy		E_{on}	$V_{CE}=600V,$	-	58	-	mJ
Turn-off energy		E_{off}	$I_C=15A$	-	32	-	
Total switching energy		E_{total}	$R_G=56\Omega$	-	26	-	

Anti-Parallel Diode Characteristics (Ta=25°C)

Characteristics	Symbol	Test Condition	Min	Type	Max	Unit
Forward voltage(diode)	V_{DSF}	$I_S=15A, V_{GS}=0V$	-	-	-2.7	V
Reverse recovery time	t_{rr}	$I_S=10A, V_{GS}=0V, R=800V$	-	150	-	ns
Reverse recovery charge	Q_{rr}	$di_{DR} / dt = 750 A / \mu s$	-	1.2	-	μC

- Note 1.Repeativity rating :pulse width limited by junction temperature
 2.Allowed number of short circuits:<1000; time
 3.Pulse Test:Pulse Width $\leq 300\mu s$,Duty Cycle $\leq 2\%$
 4. Essentially independent of operating temperature.

This transistor is an electrostatic sensitive device
 Please handle with caution

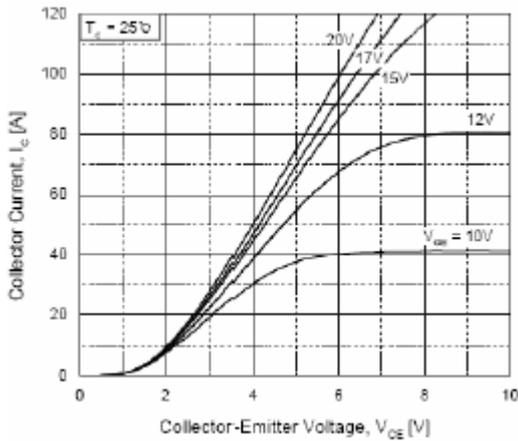


Fig.1 Out Characteristics

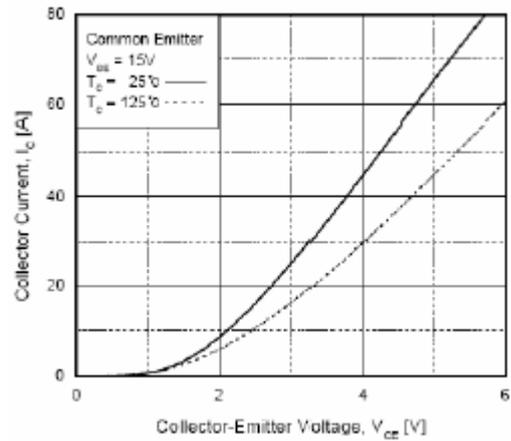


Fig.2 Saturation Voltage Characteristics

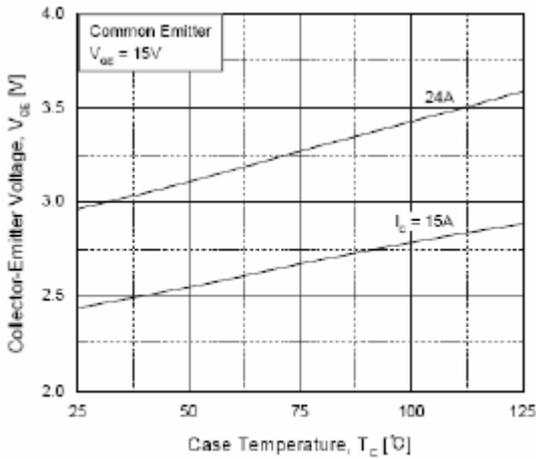


Fig.3 Saturation Voltage vs Case Temperature

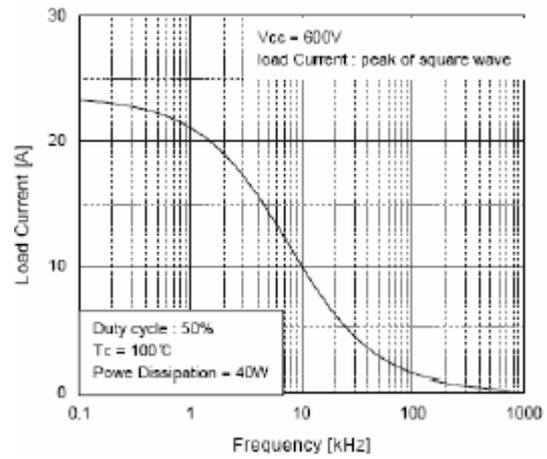


Fig.4 Load Current vs Frequency

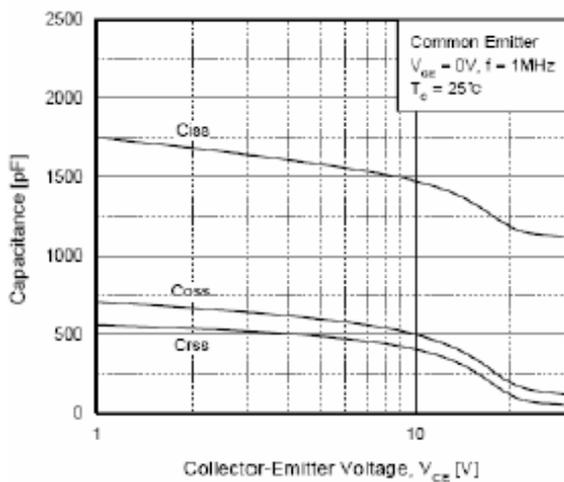


Fig.5 Capacitance Characteristics

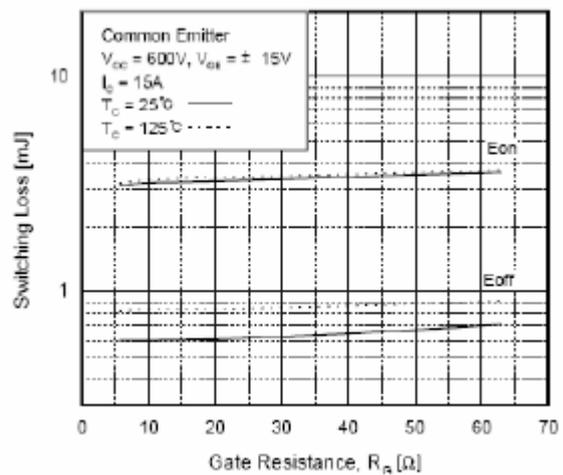


Fig.6 Switching Loss vs Gate Resistance

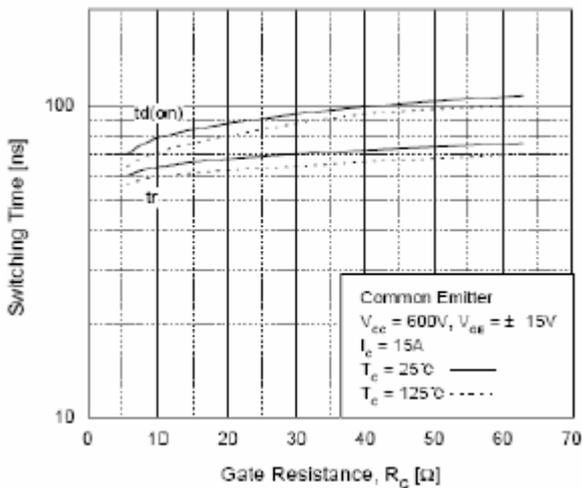


Fig.7 Turn-on Characteristics vs Gate Resistance

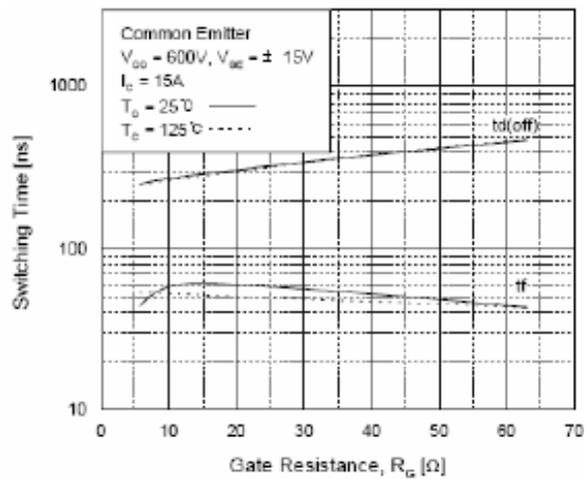


Fig.8 Turn-off Characteristics vs Gate Resistance

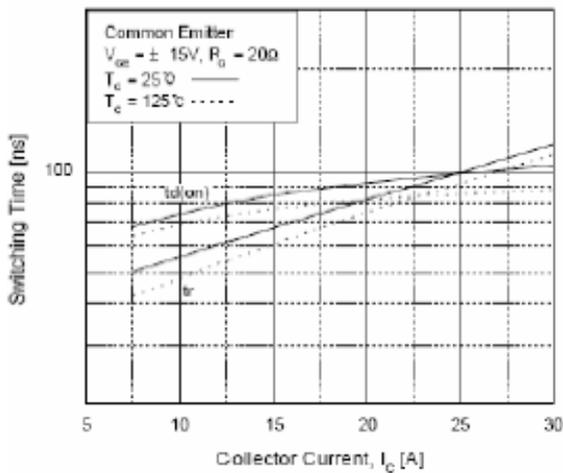


Fig.9 Turn-on Characteristics vs Collector Current

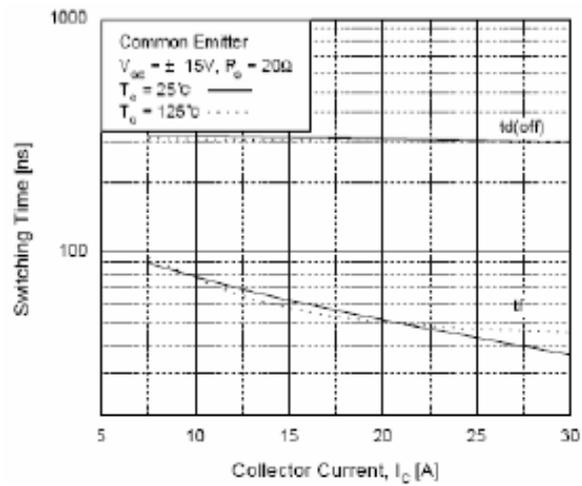


Fig.10 Fig.9 Turn-off Characteristics vs Collector Current

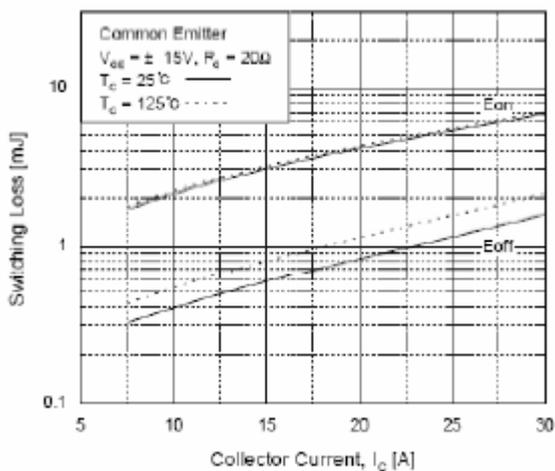


Fig.11 Switching Loss vs Collector Current

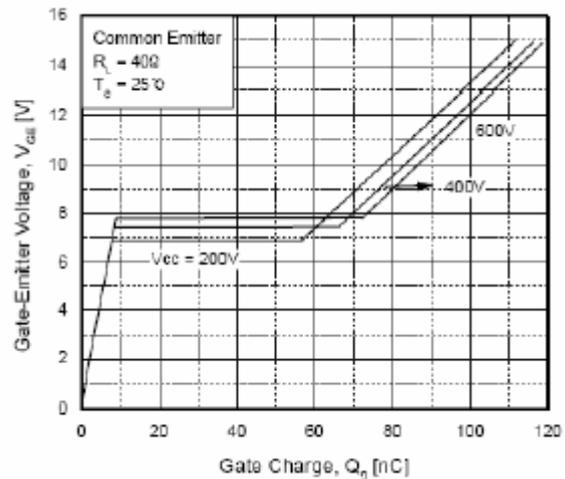


Fig.12 Out Gate Charge Characteristics

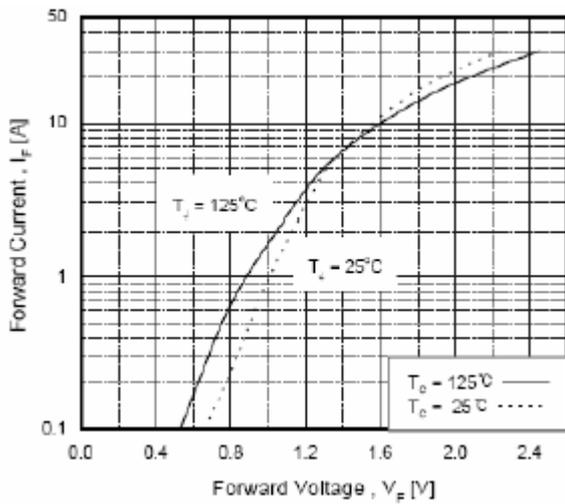


Fig.13 Forward Characteristics

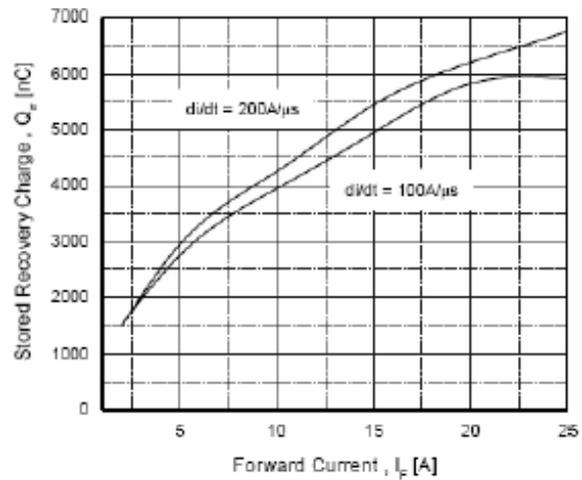


Fig.13 Stored Characteristics

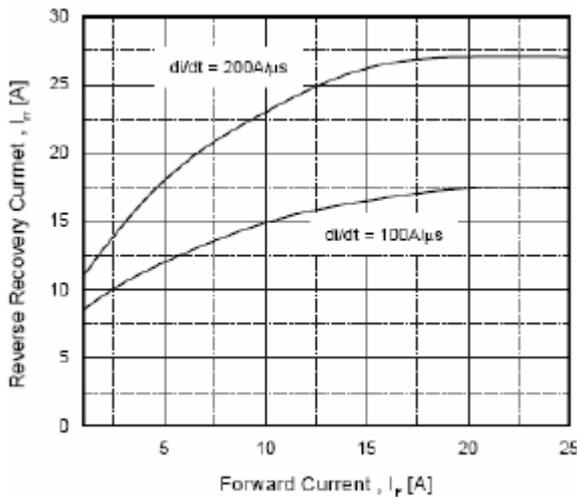


Fig.15 Reverse Recovery Current Characteristics

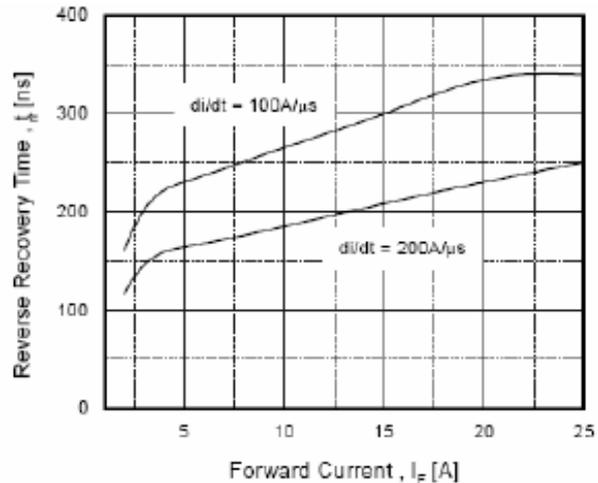


Fig.16 Reverse Recovery Time Characteristics

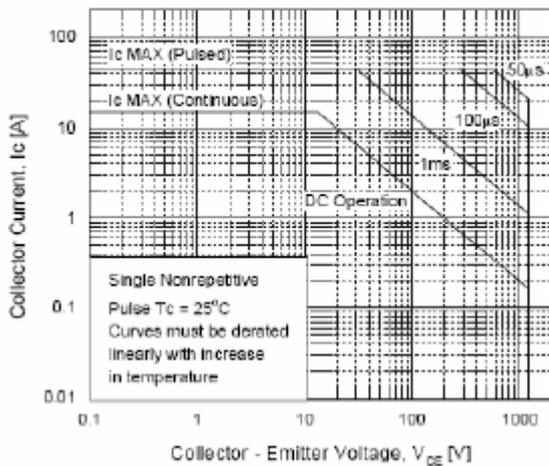


Fig.17 Maximum Safe Operation Area

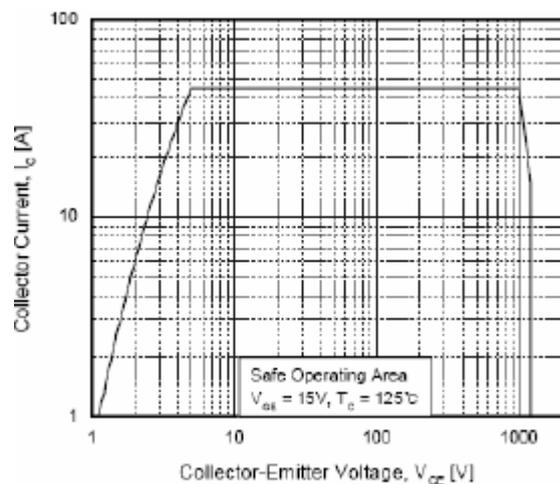


Fig.18 Turn-off Safe Operation Area

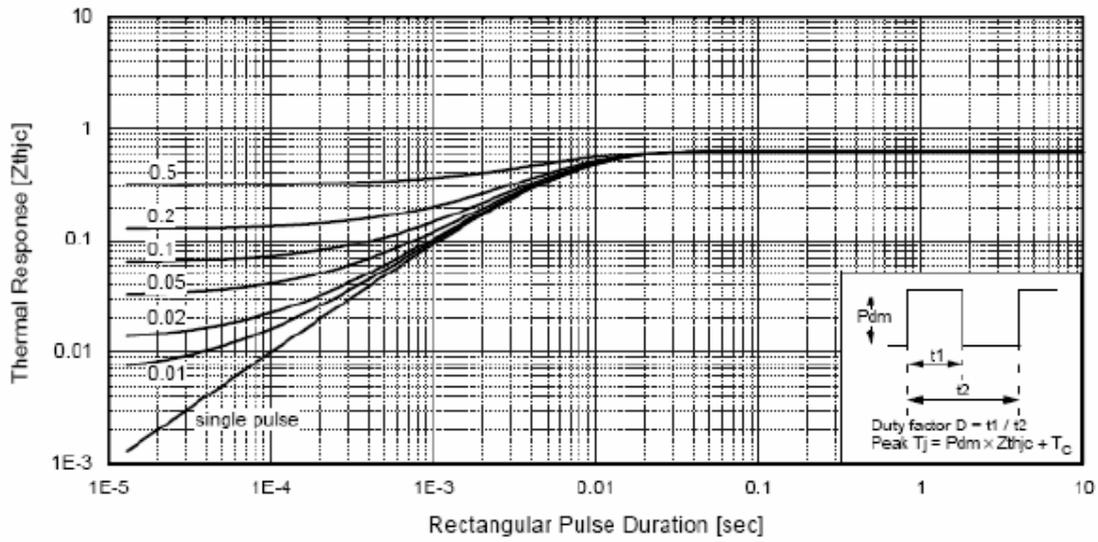


Fig.17 Maximum Safe Operation Area

TO-3PN Package Dimension

