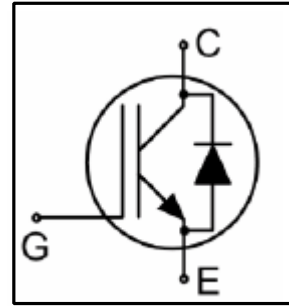


Low Loss IGBT

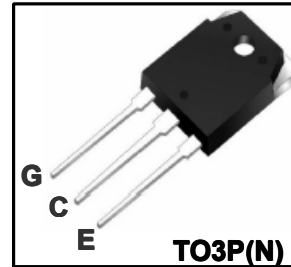
Features

- 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} =±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} <10μs	-	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 =56Ω	-	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 =56Ω	-	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 / μs	-	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≤300us,Duty Cycle≤2%
 4. Essentially independent of operating temperature.

This transistor is an electrostatic sensitive device
 Please handle with caution

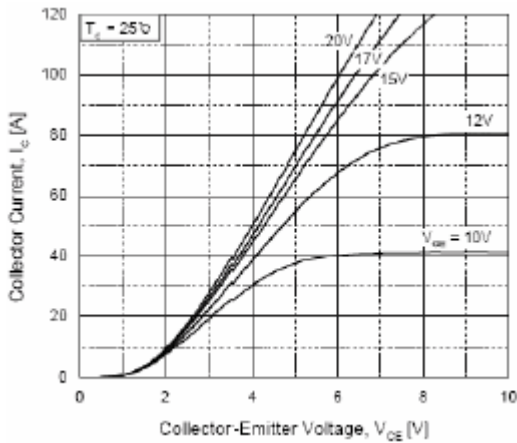


Fig.1 Out Characteristics

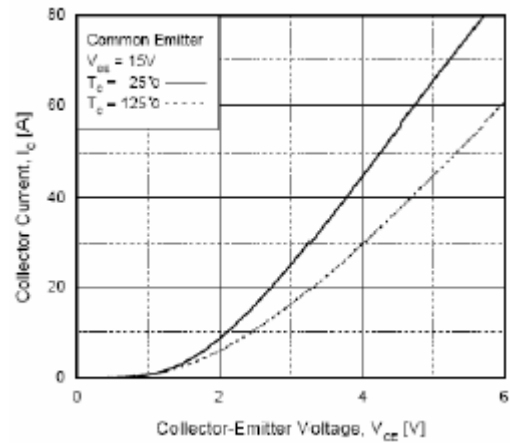


Fig.2 Saturation Voltage Characteristics

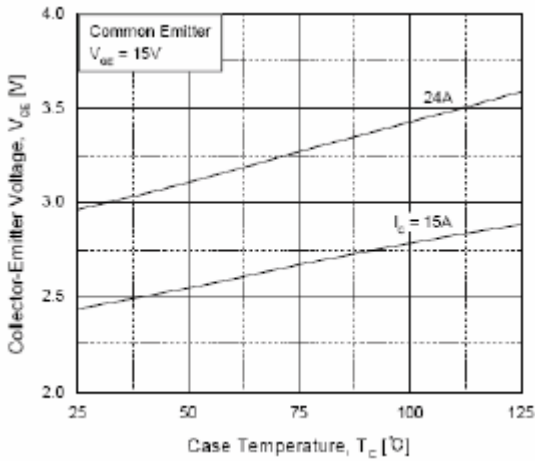


Fig.3 Saturation Voltage vs Case Temperature

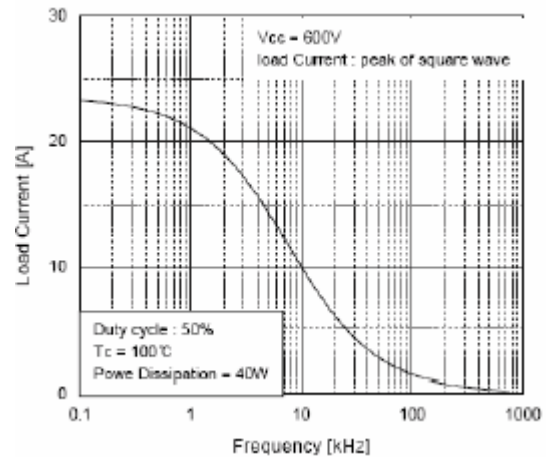


Fig.4 Load Current vs Frequency

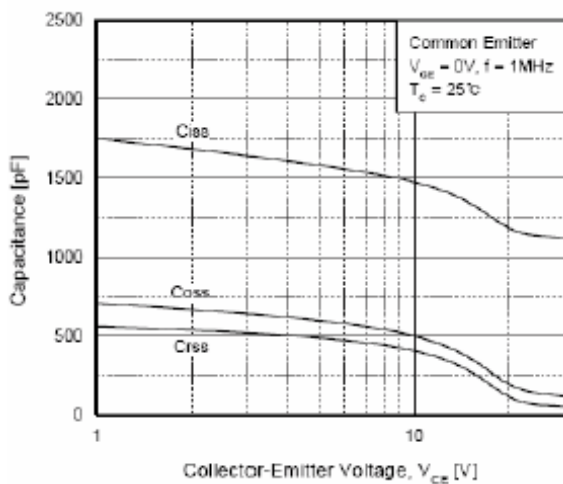


Fig.5 Capacitance Characteristics

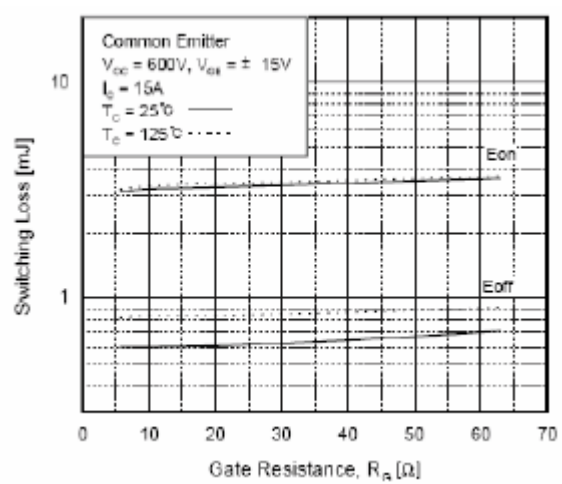


Fig.6 Switching Loss vs Gate Resistance

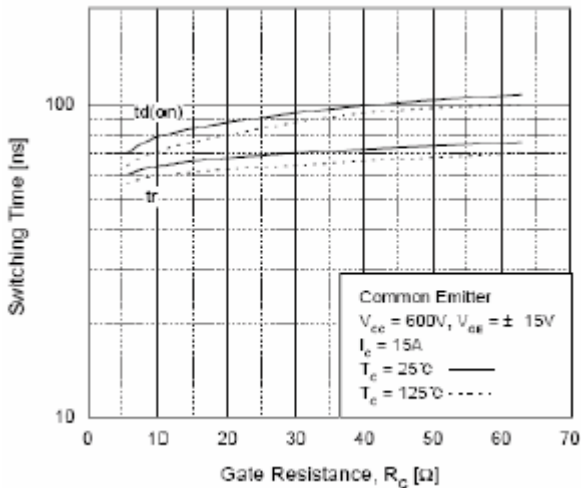


Fig.7 Turn-on Characteristics vs Gate Resistance

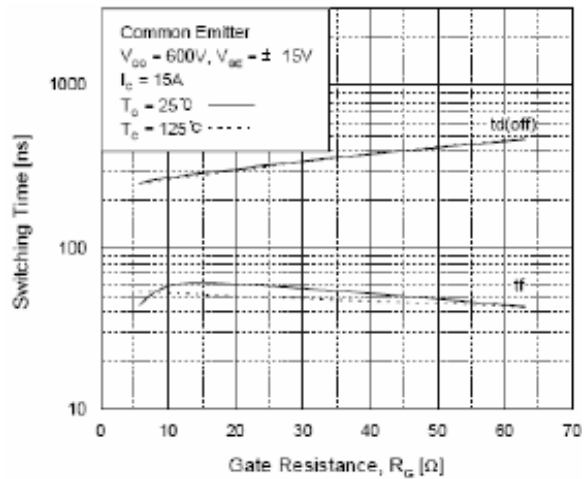


Fig.8 Turn-off Characteristics vs Gate Resistance

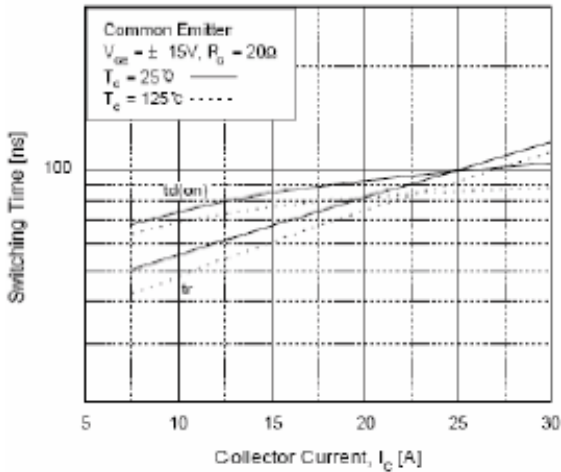


Fig.9 Turn-on Characteristics vs Collector Current

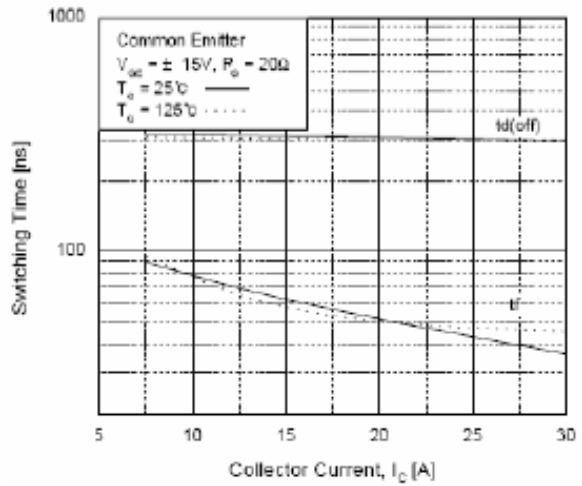


Fig.10 Turn-off Characteristics vs Collector Current

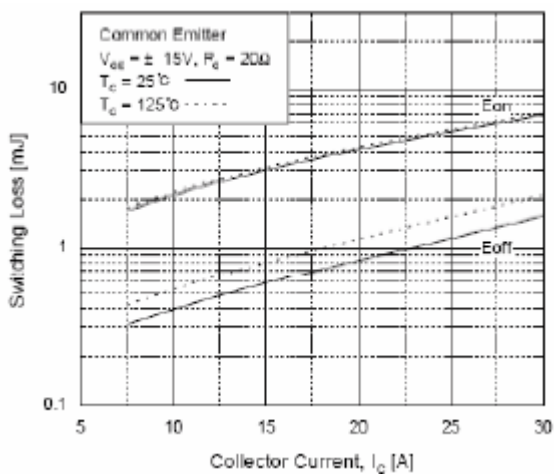


Fig.11 Switching Loss vs Collector Current

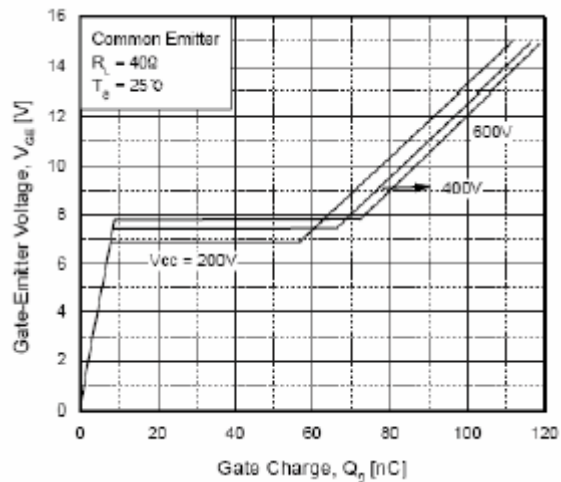


Fig.12 Out Gate Charge Characteristics

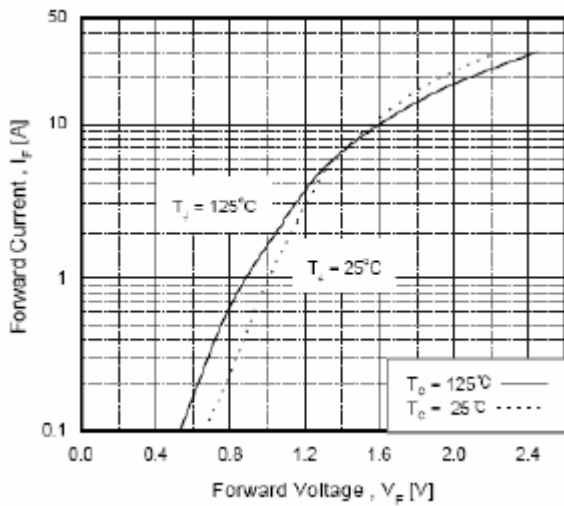


Fig.13 Forward Characteristics

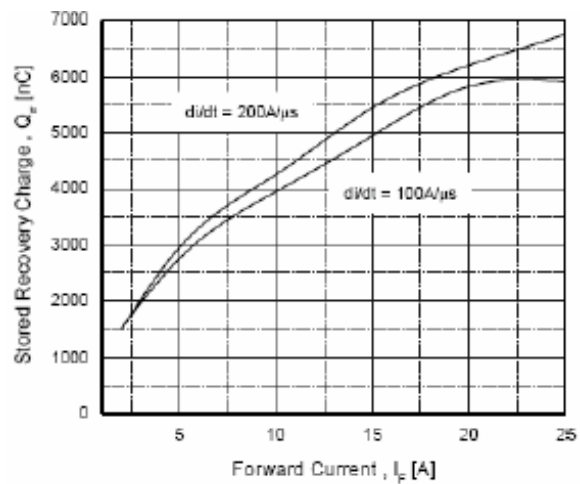


Fig.13 Stored Characteristics

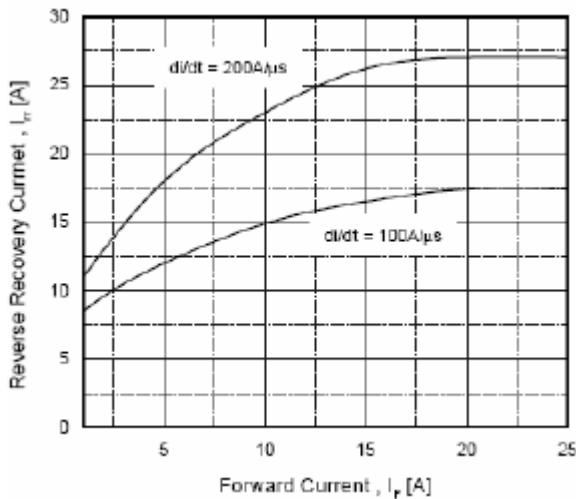


Fig.15 Reverse Recovery Current Characteristics

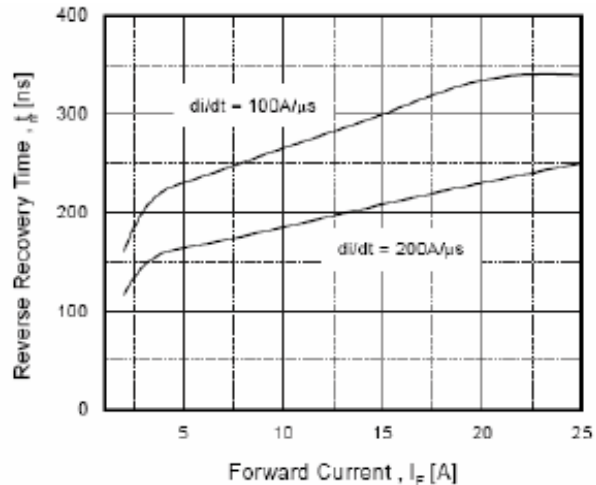


Fig.16 Reverse Recovery Time Characteristics

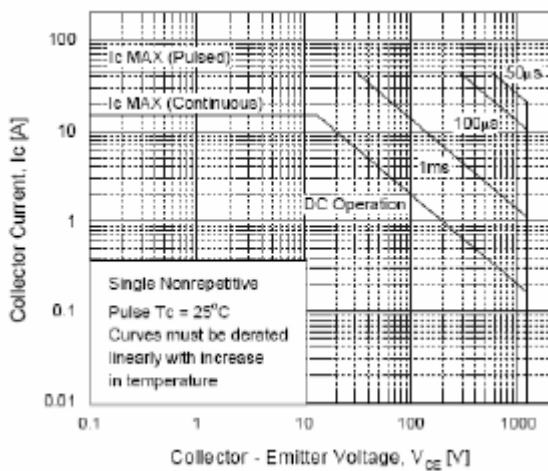


Fig.17 Maximum Safe Operation Area

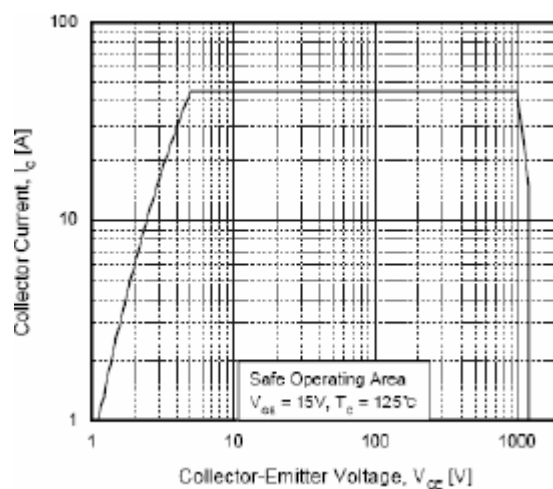


Fig.18 Turn-off Safe Operation Area

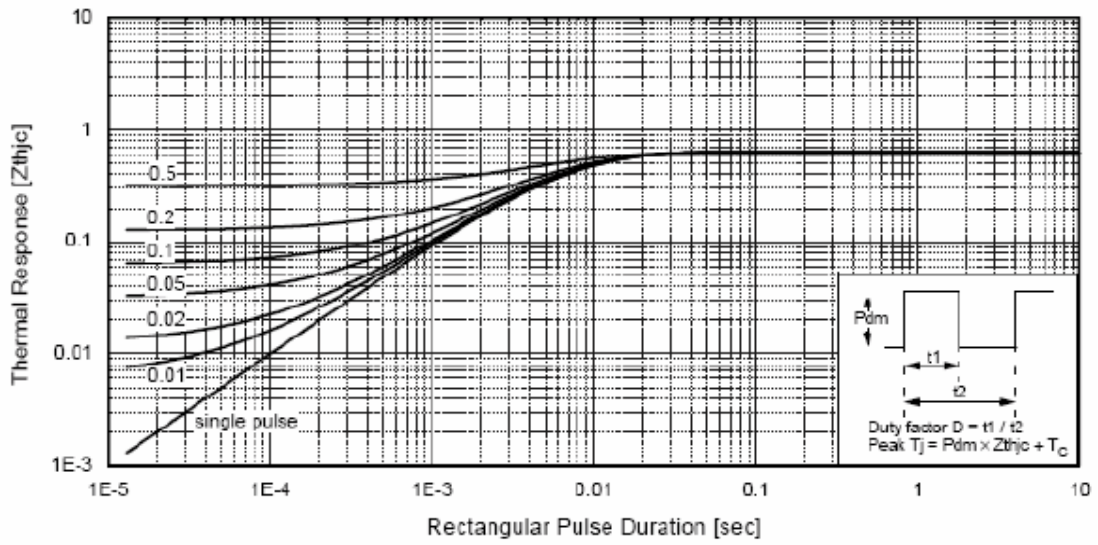


Fig.17 Maximum Safe Operation Area

TO-3PN Package Dimension

