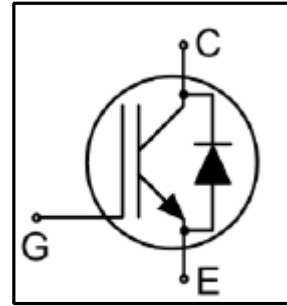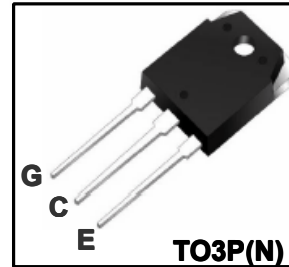# WINSEMI
MICROELECTRONICS

WGW15G120N

Low Loss IGBT

Features

■ 15A,1200V,$V_{CE(sat)}$(Typ.=2.4v)@I_C=15A & Tc=100℃

■ 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)

TO3P(N)

Absolute Maximum Ratings(Tc=25℃）

Symbol	Parameter		Value	Unit
V_{CES}	Collector-Emitter Voltage		1200	V
I_C	DC Collector Current	Tc=25℃	30	A
		Tc=100℃	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}≤1200V,T_J≤150℃	10	μs
	Turn-off safe area	V_{CE}≤1200V,T_J≤150℃	45	A
P_D	Total Dissipation		150	W
T_J	Operation Junction Temperature		-40 ~ 150	℃
T_{STG}	Storage Temperature		-50 ~ 150	℃
T_L	Maximum Lead Temperature for Soldering Purposes		300	℃

Thermal Characteristics

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

Electrical Characteristics(Tc=25℃)

Characteristics	Symbol	Test Condition		Min	Typ	Max	Unit
Gate-body leakage current	I_{GES}	$V_{GS}=\pm30V, V_{CE}=0V$		-	-	±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℃		2.8	-	
			Tc=150℃		3.0	-	
Zero Gate Voltage Collector current	I_{CES}	$V_{CE}=1200V,$ $V_{GE}=0V$		-	-	0.2	mA
			Tc=100℃	-	-	2.0	
			Tc=150℃	-	-	2.5	
Gate threshold voltage	$V_{GE(th)}$	$V_{CE}=V_{GE}, I_D=0.6mA$		4.5	-	6.5	V
Forward Transconductance	gfs	$V_{CE}=20V, I_D=15A$		-	10	-	S
Short Collector Current	IC(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	Td(on)	$V_{CE}=600V,$ $I_C=15A$ $R_G=56\Omega$	-	25	-	ns
	Turn-onRise time	tr		-	60	-	
	Turn-off delay time	Td(off)		-	20	-	
	Turn-off Fall time	tf		-	95	-	
Turn-on energy	E_{on}	$V_{CE}=600V,$		-	58	-	mJ
Turn-off energy	E_{off}	$I_C=15A$		-	32	-	
Total swiitching energy	E_{total}	$R_G=56\Omega$		-	26	-	

Anti-Parallel Diode Characteristics (Ta=25℃)

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	trr	$I_S=10A, V_{GS}=0V, _R=800V$	-	150	-	ns
Reverse recovery charge	Qrr	$dI_{DR}/dt=750 A/\mu s$	-	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≤300us,Duty Cycle≤2%
4. Essentially independent of operating temperature.
This transistor is an electrostatic sensitive device
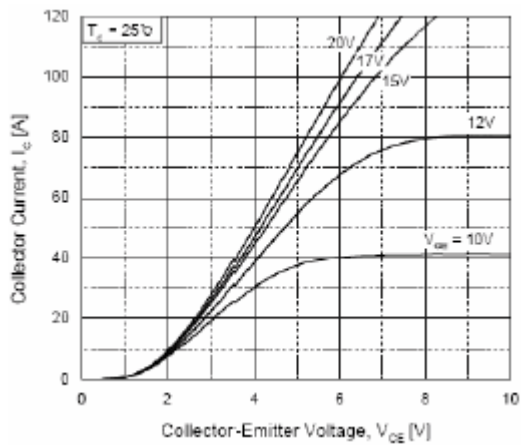Please handle with caution

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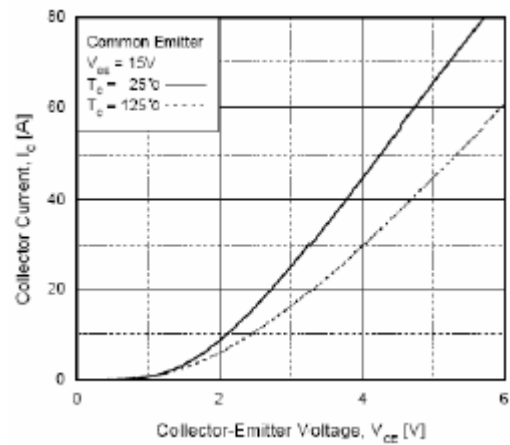MICROELECTRONICS

Fig.1 Out Characteristics

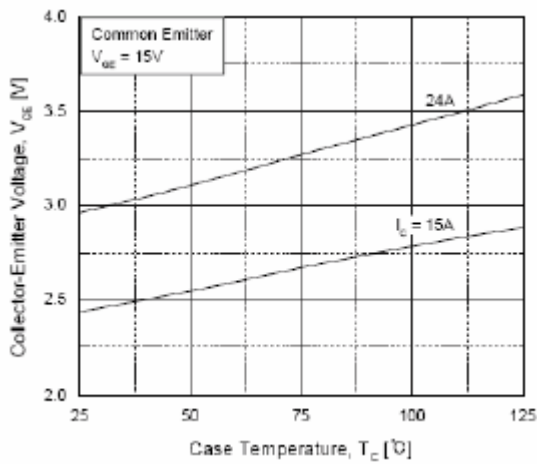**Fig.2 Saturation Voltage Characteristics**

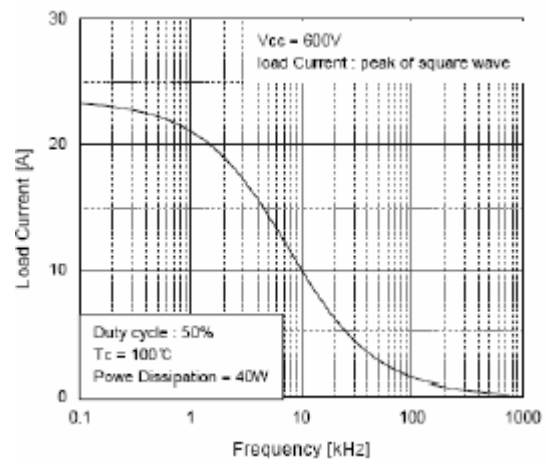**Fig.3 Saturation Voltage vs Case Temperature**
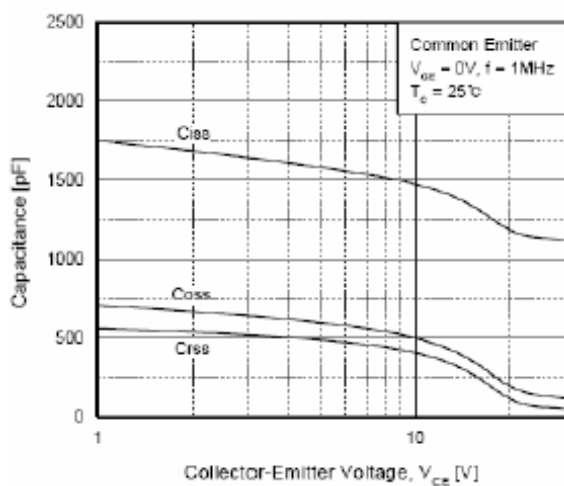

Fig.4 Load Current vs Frequency

Fig.5 Capacitance Characteristics
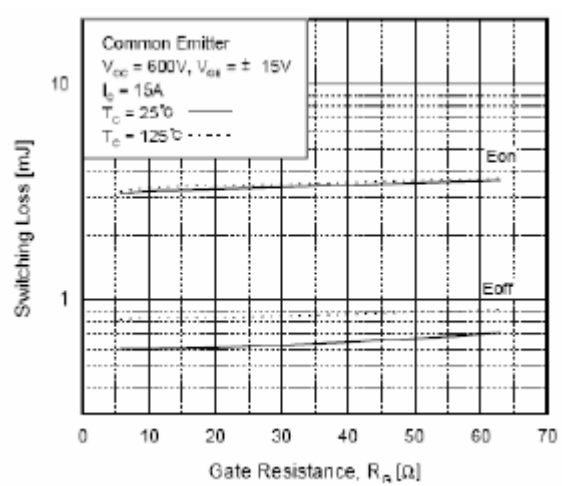

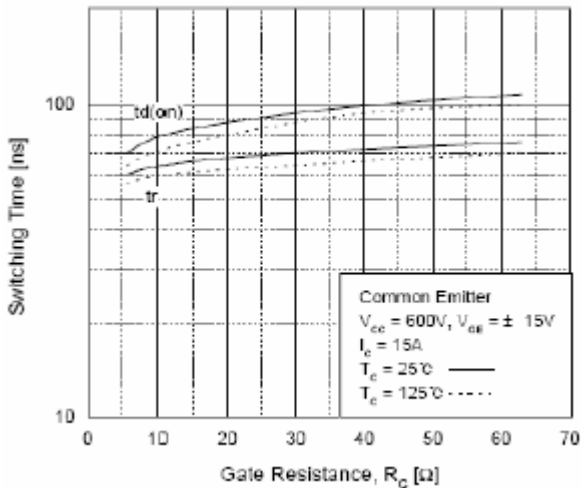**Fig.6 Switching Loss vs Gate Resistance**

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Fig.7 Turn-on Characteristics vs Gate Resistance
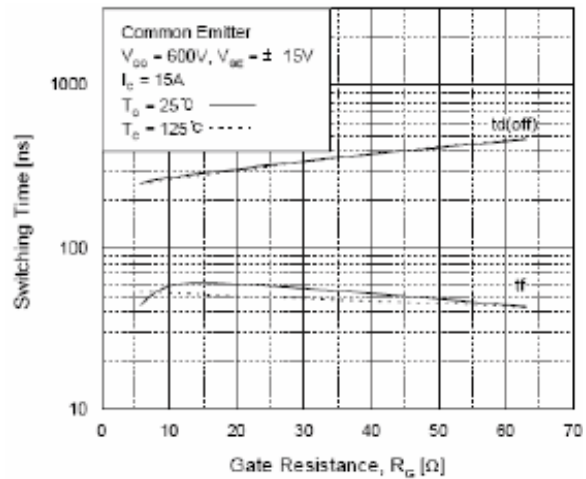
Fig.8 Turn-off Characteristics vs Gate Resistance
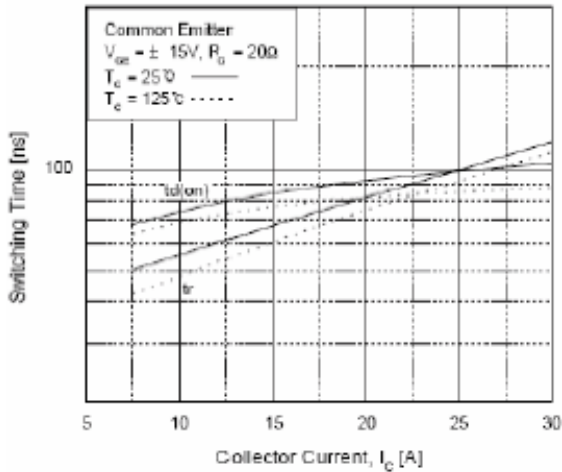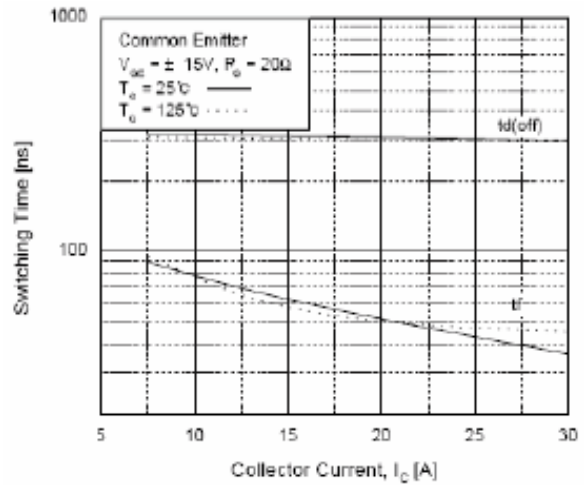

Fig.9 Turn-on Characteristics vs Collector Current

Fig.10 Fig.9 Turn-off Characteristics vs Collector Current
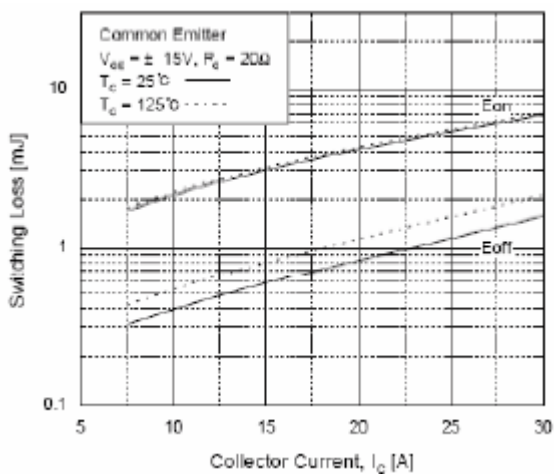
Fig.11 Switching Loss vs Collector Current
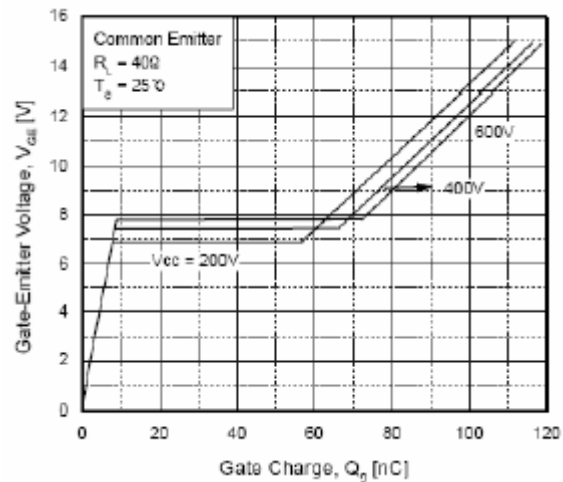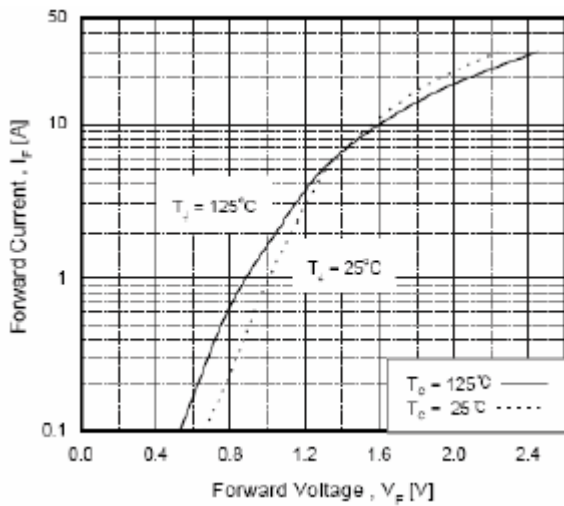

Fig.12 Out Gate Charge Characteristics

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Fig.13 Forward Characteristics
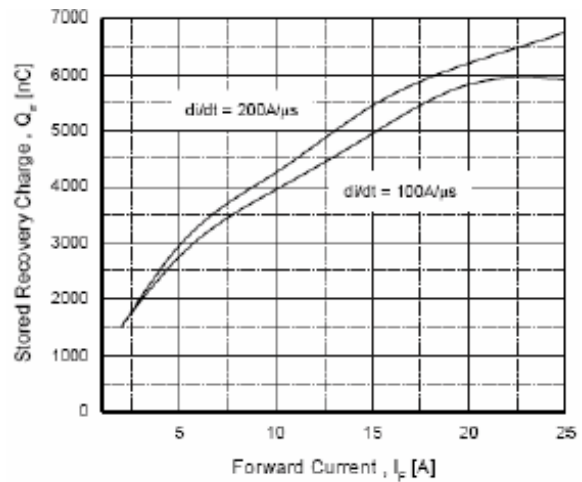
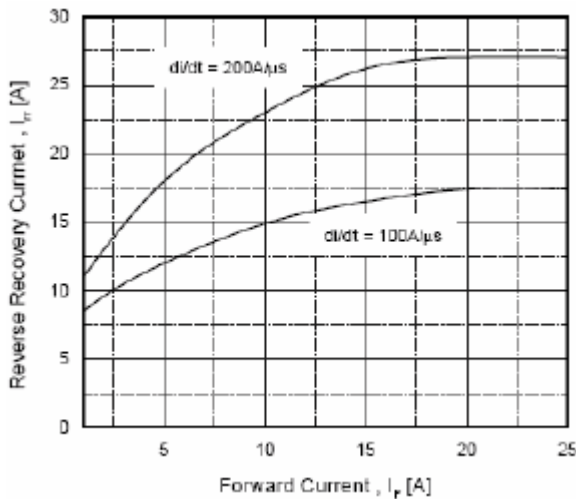**Fig.13 Stored Characteristics**

Fig.15 Reverse Recovery Current Characteristics
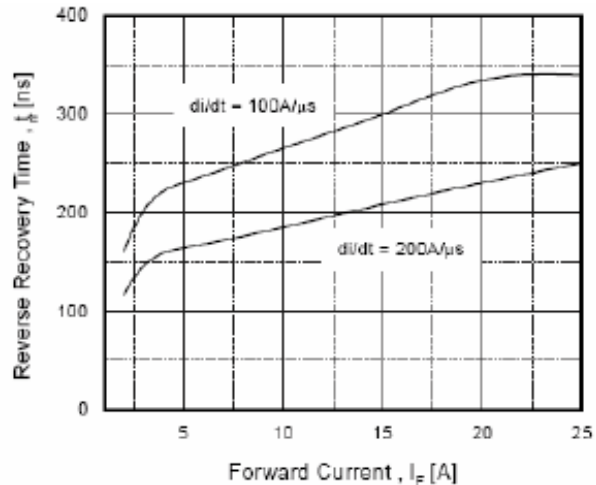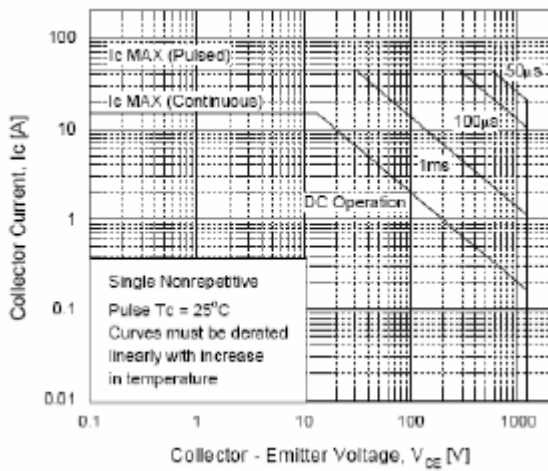

Fig.16 Reverse Recovery Time Characteristics

Fig.17 Maximum Safe Operation Area

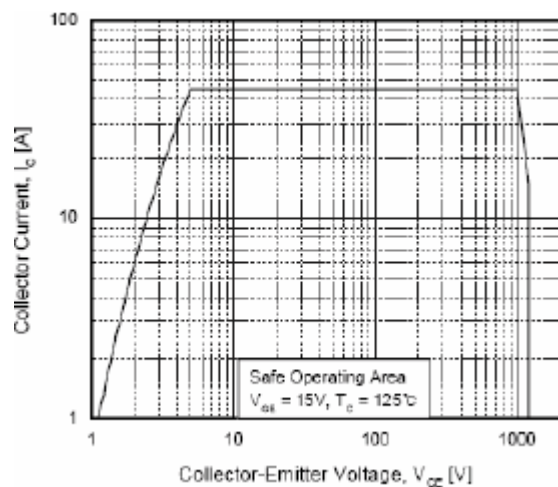**Fig.18 Turn-off Safe Operation Area**

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Fig.17 Maximum Safe Operation Area

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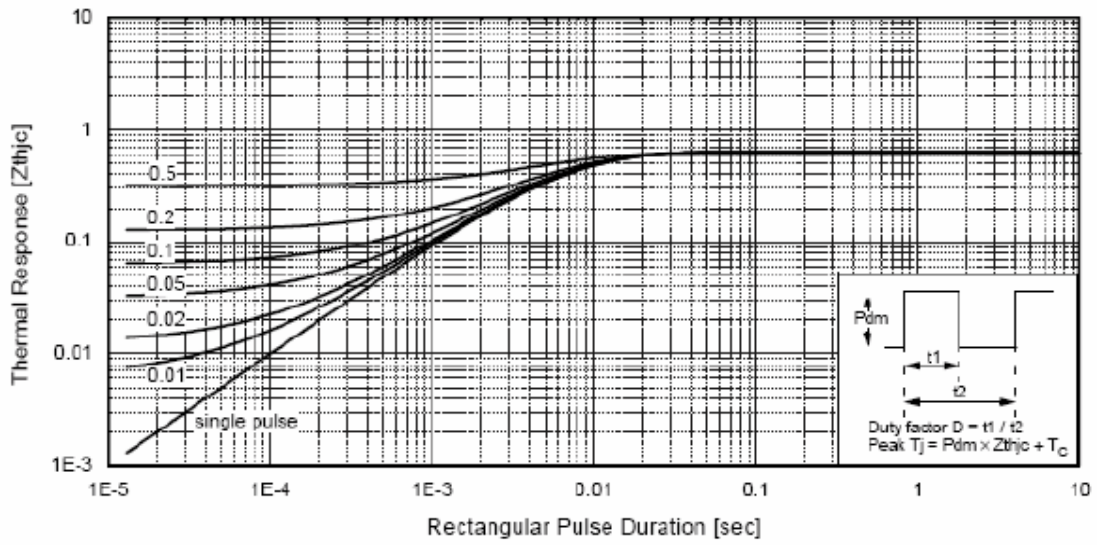
TO-3PN　Package Dimension

Unit:mm

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