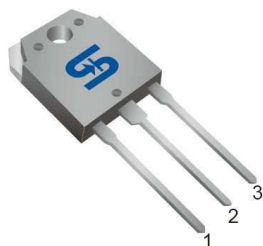


TO-3P
Pin Definition:

1. Gate
2. Collector
3. Emitter


PRODUCT SUMMARY

V_{CES} (V)	V_{GES} (V)	I_C (A)
1200	± 30	10.5

General Description

The TSG10N120CN using proprietary trench design and advanced NPT technology, the 1200V NPT IGBT offers superior conduction and switching performances, high avalanche ruggedness and easy parallel operation. This device is well suited for the resonant or soft switching application such as induction heating, microwave oven, etc.

Features

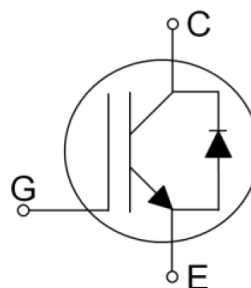
- 1200V NPT Trench Technology
- High Speed Switching
- Low Saturation Voltage

Ordering Information

Part No.	Package	Packing
TSG10N120CN C0G	TO-3P	30pcs / Tube

Note: "G" denote for Halogen Free Product

Block Diagram



NPT Trench IGBT

Absolute Maximum Rating ($T_A=25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Limit	Unit
Collector-Emitter Voltage	V_{CES}	1200	V
Gate-Emitter Voltage	V_{GES}	± 30	V
Continuous Current	I_C	21	A
		10.5	A
Pulsed Collector Current *	I_{CM}	42	A
Diode Forward Current ($T_C=100^\circ\text{C}$)	I_F	8	A
Diode Pulse Forward Current	I_{FM}	40	A
Max Power Dissipation	P_D	125	W
Operating Junction Temperature	T_J	-55 to +150	$^\circ\text{C}$
Storage Temperature Range	T_{STG}	-55 to +150	$^\circ\text{C}$

* Repetitive rating: Pulse width limited by max. junction temperature

Thermal Performance

Parameter		Symbol	Limit	Unit
Thermal Resistance - Junction to Case	IGBT	$R\theta_{JC}$	1	$^{\circ}\text{C/W}$
	DIODE		2	
Thermal Resistance - Junction to Ambient		$R\theta_{JA}$	40	

Electrical Specifications (T_c=25 $^{\circ}$ C unless otherwise noted)

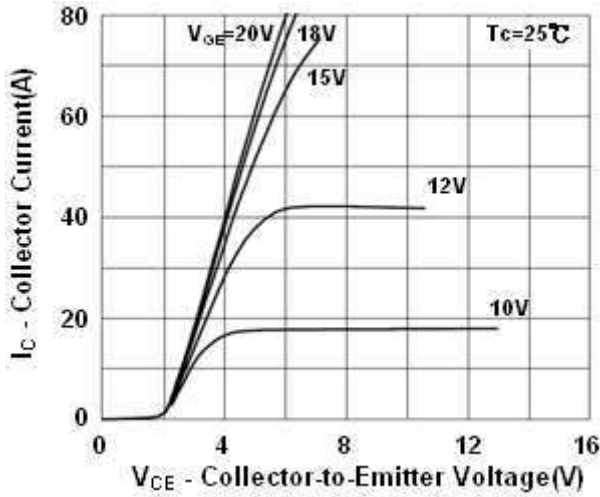
Parameter	Conditions	Symbol	Min	Typ	Max	Unit
Static						
Collector-Emitter Leakage Current	$V_{CE} = 1200V, V_{GE} = 0V$	I_{CES}	--	--	1	mA
Gate-to-Emitter Leakage Current	$V_{GE} = \pm 30V, V_{CE} = 0V$	I_{GES}	--	--	± 500	nA
Gate Threshold Voltage	$V_{GE} = V_{CE}, I_C = 250\mu A$	$V_{GE(TH)}$	3	--	7	V
Collector-Emitter Saturation Voltage	$V_{GE} = 15V, I_C = 5A$	$V_{CE(SAT)}$	--	2.3	2.7	V
Dynamic						
Input Capacitance	$V_{CE} = 30V, V_{GE} = 0V,$ $f = 1.0MHz$	C_{IES}	--	6800	10880	pF
Output Capacitance		C_{OES}	--	65	--	
Reverse Transfer Capacitance		C_{RES}	--	10	--	
Switching						
Turn-On Delay Time	$V_{CC} = 960V, I_C = 5A,$ $R_G = 22\Omega, V_{GE} = 15V$ Inductive Load, $T_J = 25^{\circ}C$	$t_{d(on)}$	--	30	--	nS
Rise Time		t_r	--	13	--	
Turn-Off Delay Time		$t_{d(off)}$	--	130	--	
Fall Time		t_f	--	230	460	
Turn-On Switching Loss		E_{on}	--	0.3	--	mJ
Turn-Off Switching Loss		E_{off}	--	0.5	--	
Total Gate Charge	$V_{CC} = 600V, I_C = 5A,$ $V_{GE} = 15V$	Q_g	--	33	53	nC
Gate-Emitter Charge		Q_{ge}	--	6.5	--	
Gate-Collector Charge		Q_{gc}	--	17.5	--	

Electrical Specifications of the DIODE (T_c=25 $^{\circ}$ C unless otherwise noted)

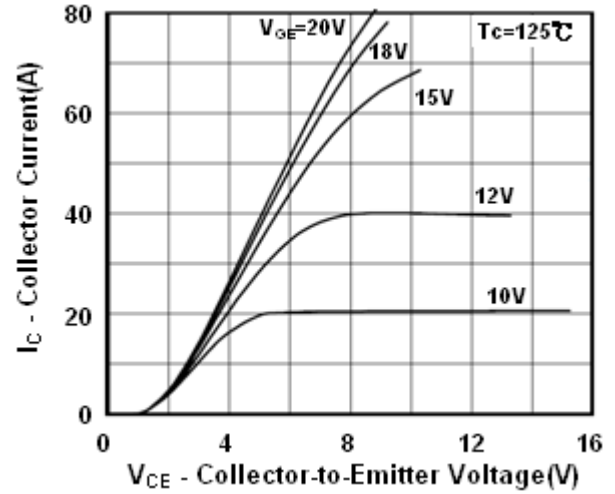
Parameter	Conditions	Symbol	Min	Typ	Max	Unit
Forward Voltage	$I_F = 8\text{A},$	V_F	--	2.5	3.2	V
Reverse Recovery Time	$I_F = 8\text{A}, di/dt=100\text{A/us}$	t_{rr}	--	70	--	ns
Reverse Recovery Charge		Q_{rr}	--	170	--	nC

Electrical Characteristics Curve ($T_c = 25^\circ\text{C}$, unless otherwise noted)

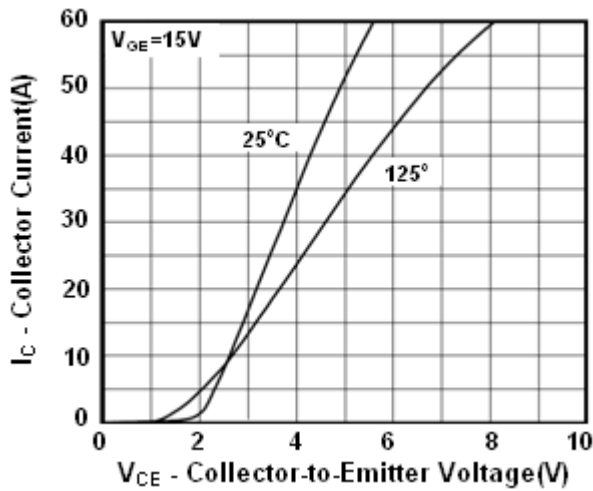
Output Characteristics



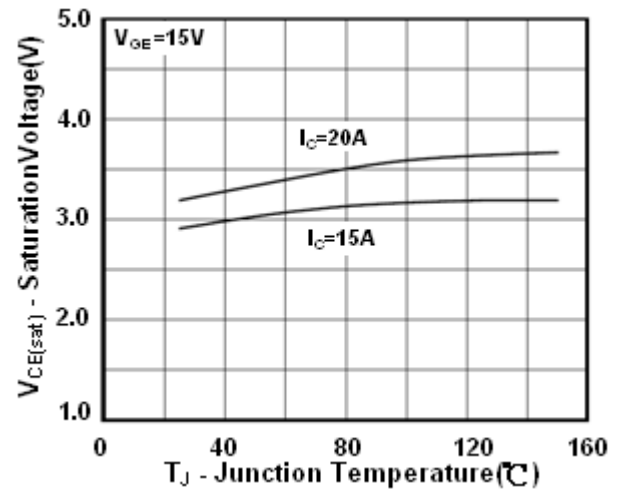
Output Characteristics



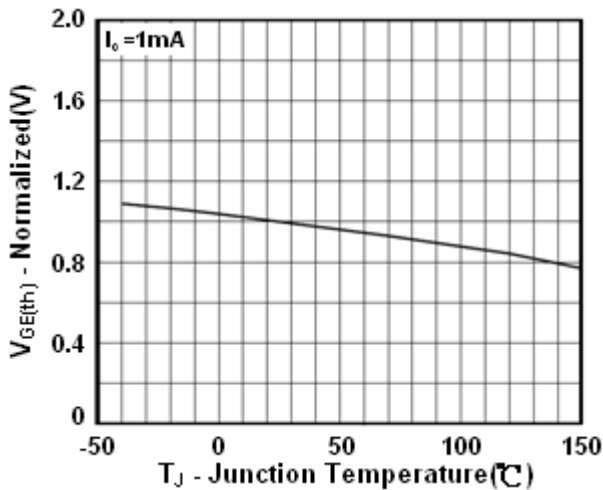
Saturation voltage characteristics



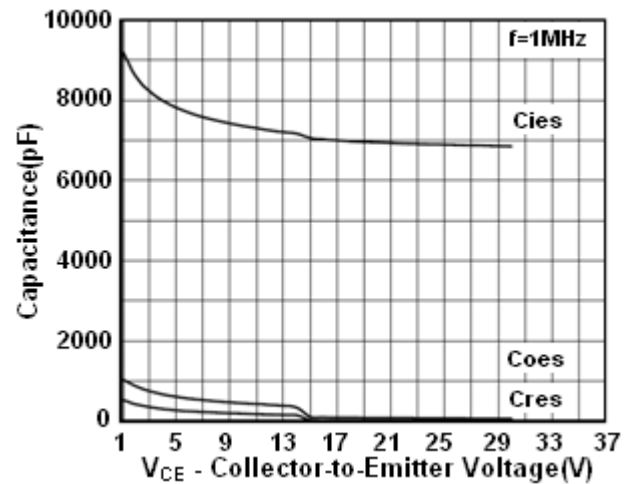
Collector-Emitter Voltage vs. Junction Temperature



Gate Threshold Voltage vs. Junction Temperature

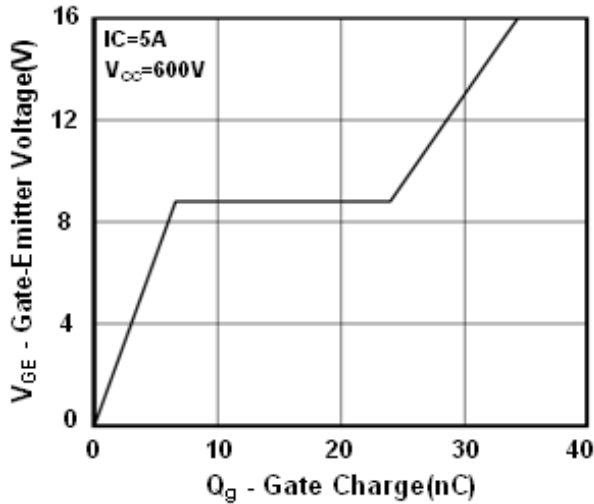


Capacitance characteristics

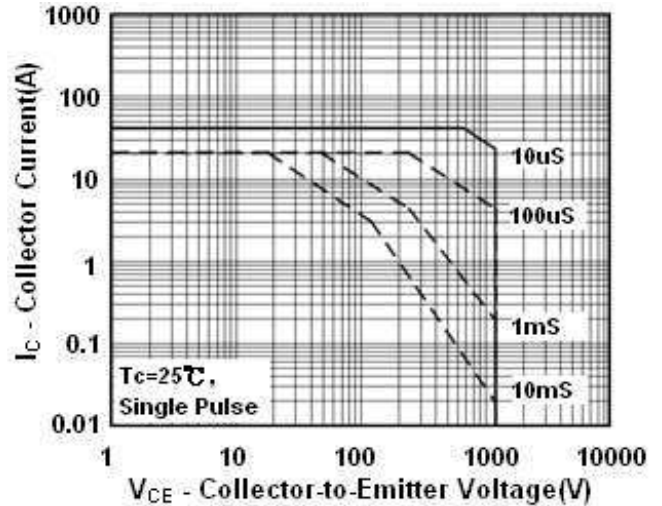


Electrical Characteristics Curve ($T_c = 25^\circ\text{C}$, unless otherwise noted)

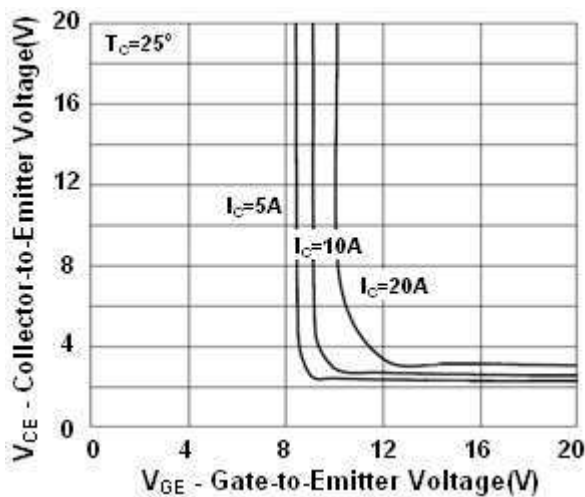
Gate charge characteristics



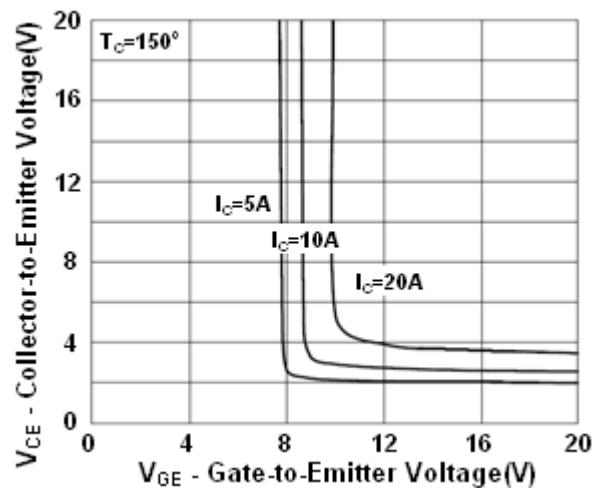
SOA Characteristics



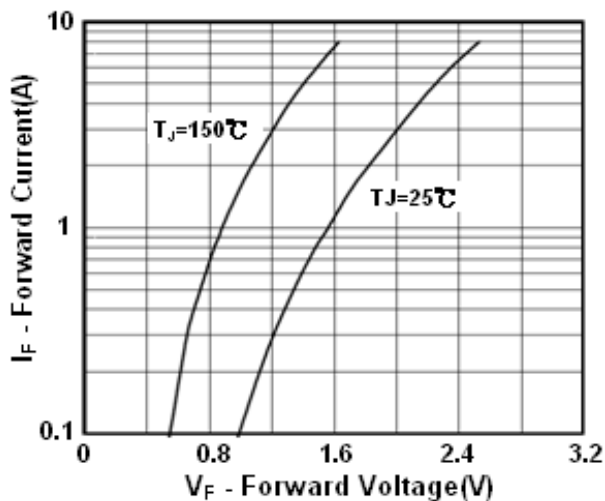
Saturation Voltage vs. V_{GE}



Saturation Voltage vs. V_{GE}

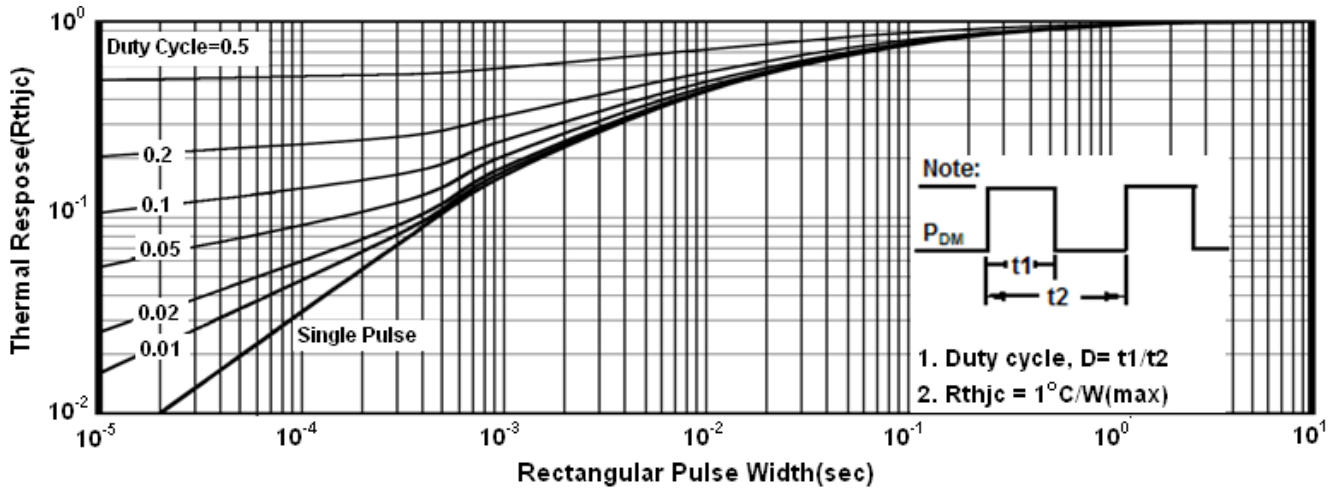


Forward Characteristic of Diode

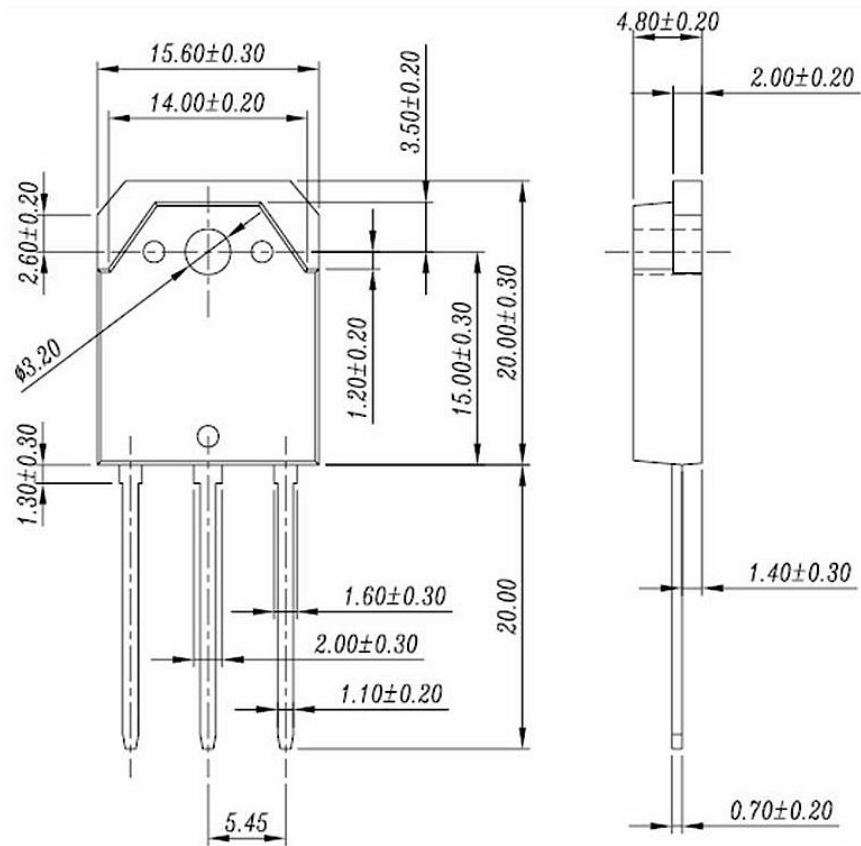


Electrical Characteristics Curve (Ta = 25°C, unless otherwise noted)

Normalized Thermal Transient Impedance, Junction-to-Ambient



TO-3P Mechanical Drawing



Unit: Millimeters

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