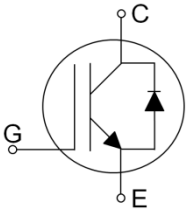
1200V NPT Trench Technology
High Speed Switching
Low Conduction Loss
Positive Temperature Coefficient
Easy parallel Operation
RoHS compliant
JEDEC Qualification



Applications :
Induction Heating, Soft switching application

Device	Package	Marking	Remark
TGAN25N120ND	TO-3PN	TGAN25N120ND	RoHS

Absolute Maximum Ratings

Parameter		Symbol	Value	Unit
Collector-Emitter Voltage		V_{CES}	1200	V
Gate-Emitter Voltage		V_{GES}	20	V
Continuous Collector Current	T_C = 25	I_C	50	A
	T_C = 100		25	A
Pulsed Collector Current (Note 1)		I_{CM}	100	A
Diode Continuous Forward Current	T_C = 100	I_F	25	A
Diode Maximum Forward Current		I_{FM}	75	A
Power Dissipation	T_C = 25	P_D	312	W
	T_C = 100		125	W
Operating Junction Temperature		T_J	-55 ~ 150	
Storage Temperature Range		T_{STG}	-55 ~ 150	
Maximum lead temperature for soldering purposes,		T_L	300	

Thermal Characteristics

Parameter	Symbol	Value	Unit
Maximum Thermal resistance, Junction-to-Case	$R_{\theta JC}$ (IGBT)	0.4	/W
Maximum Thermal resistance, Junction-to-Case	$R_{\theta JC}$ (DIODE)	2.1	/W
Maximum Thermal resistance, Junction-to-Ambient	$R_{\theta JA}$	40	/W

Electrical Characteristics of the IGBT T_C=25 , unless otherwise noted

Parameter	Symbol	Test condition	Min.	Typ.	Max.	Unit
OFF						
Collector Emitter Breakdown Voltage	BV_{CES}	V_{GE} = 0V, I_C = 1mA	1200	--	--	V
Zero Gate Voltage Collector Current	I_{CES}	V_{CE} = 1200V, V_{GE} = 0V	--	--	1	mA
Gate Emitter Leakage Current	I_{GES}	V_{CE} = 0V, V_{GE} = ± 20V	--	--	± 250	nA
ON						
Gate Emitter Threshold Voltage	$V_{GE(TH)}$	V_{GE} = V_{CE}, I_C = 25mA	3.0	5.0	7.0	V
Collector Emitter Saturation Voltage	$V_{CE(SAT)}$	V_{GE} = 15V, I_C = 25A, T_C = 25 °C	--	1.9	2.5	V
		V_{GE} = 15V, I_C = 25A, T_C = 125 °C	--	2.2	--	V
DYNAMIC						
Input Capacitance	C_{IES}	V_{CE} = 30V, V_{GE} = 0V f = 1MHz	--	4000	--	pF
Output Capacitance	C_{OES}		--	105	--	pF
Reverse Transfer Capacitance	C_{RES}		--	72	--	pF
SWITCHING (Note 2)						
Turn-On Delay Time	$t_{d(on)}$	V_{CC} = 600V, I_C = 25A R_G = 10 , V_{GE} = 15V Inductive Load, T_C = 25 °C	--	57	--	ns
Rise Time	t_r		--	65	--	ns
Turn-Off Delay Time	$t_{d(off)}$		--	240	--	ns
Fall Time	t_f		--	86	160	ns
Turn-On Switching Loss	E_{ON}		--	4.15	6.22	mJ
Turn-Off Switching Loss	E_{OFF}		--	0.87	1.31	mJ
Total Switching Loss	E_{TS}		--	5.02	7.53	mJ
Turn-On Delay Time	$t_{d(on)}$	V_{CC} = 600V, I_C = 25A R_G = 10 , V_{GE} = 15V Inductive Load, T_C = 125 °C	--	41	--	ns
Rise Time	t_r		--	57	--	ns
Turn-Off Delay Time	$t_{d(off)}$		--	265	--	ns
Fall Time	t_f		--	168	--	ns
Turn-On Switching Loss	E_{ON}		--	4.46	6.69	mJ
Turn-Off Switching Loss	E_{OFF}		--	1.74	2.61	mJ
Total Switching Loss	E_{TS}		--	6.2	9.30	mJ
Total Gate Charge	Q_g	V_{CC} = 600V, I_C = 25A V_{GE} = 15V	--	230	350	nC
Gate-Emitter Charge	Q_{ge}		--	25	40	nC
Gate-Collector Charge	Q_{gc}		--	70	100	nC

Not subject to production test verified by design/characterization

Electrical Characteristics of the DIODE T_C=25 , unless otherwise noted

Parameter	Symbol	Test condition		Min.	Typ.	Max.	Unit
Diode Forward Voltage	V_{FM}	I_F = 25A	T_C = 25 °C	--	2.0	--	V
			T_C = 125 °C	--	2.18	--	
Reverse Recovery Time	t_{rr}	I_F = 25A, di/dt = 200A/μs	T_C = 25 °C	--	300	--	ns
			T_C = 125 °C	--	360	--	
Reverse Recovery Current	I_{rr}		T_C = 25 °C	--	27	--	A
			T_C = 125 °C	--	31	--	
Reverse Recovery Charge	Q_{rr}		T_C = 25 °C	--	4000	--	nC
			T_C = 125 °C	--	5580	--	

IGBT Characteristics

Fig. 1 Output characteristics

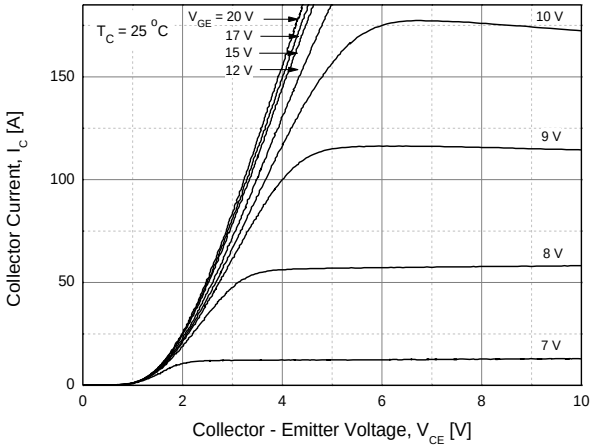


Fig. 2 Saturation voltage characteristics

Fig. 3 Saturation voltage vs. collector current

Fig. 4 Saturation voltage vs. gate bias

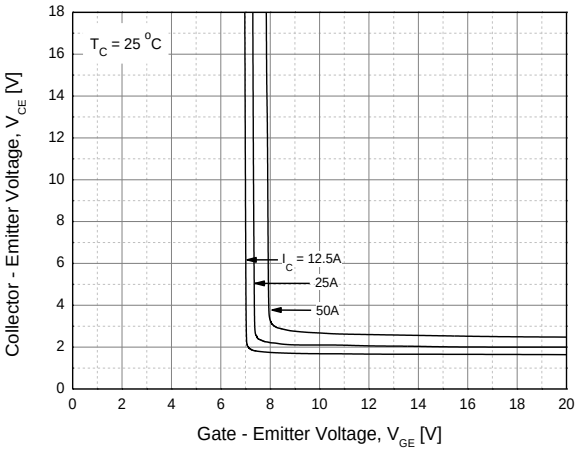


Fig. 5 Saturation voltage vs. gate bias

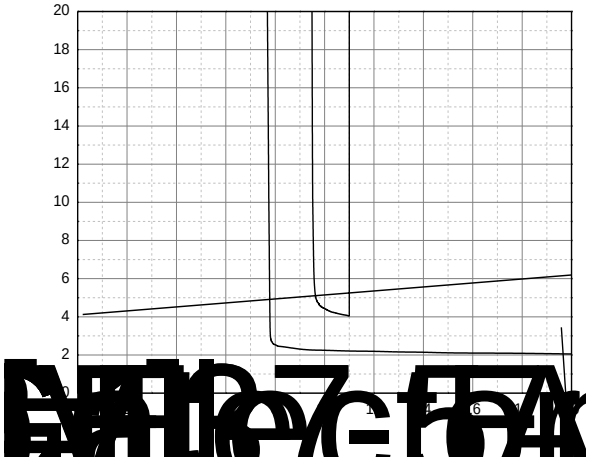


Fig. 6 Capacitance characteristics

IGBT Characteristics

Fig. 7 Turn-on time vs. gate resistor

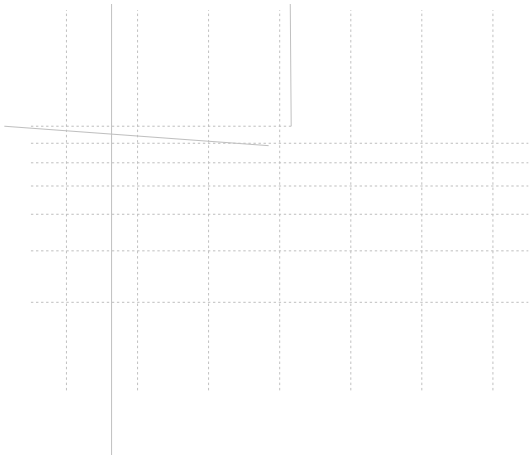


Fig. 8 Turn-off time vs. gate resistor

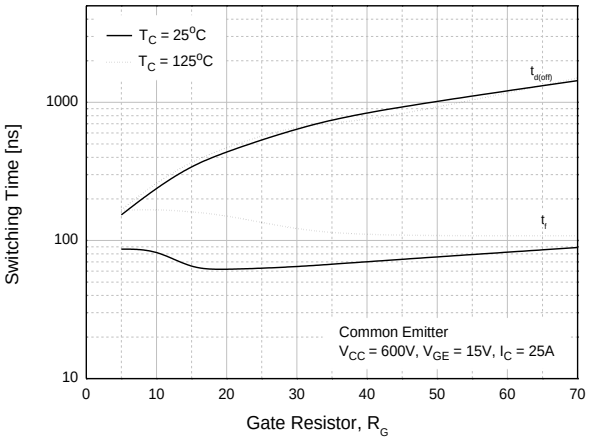


Fig. 9 Switching loss vs. gate resistor

Fig. 10 Turn-on time vs. collector current

Fig. 11 Turn-off time vs. collector current

Fig. 12 Switching loss vs. collector current

IGBT Characteristics

Fig. 13 Gate charge characteristics

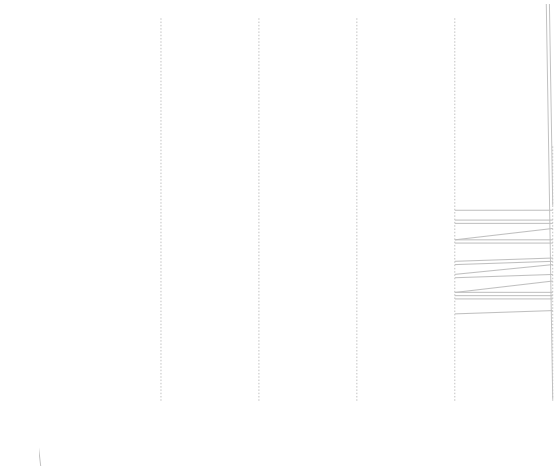


Fig. 14 SOA

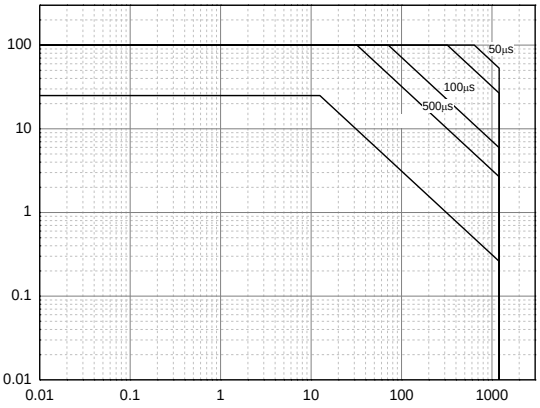


Fig. 15 RBSOA

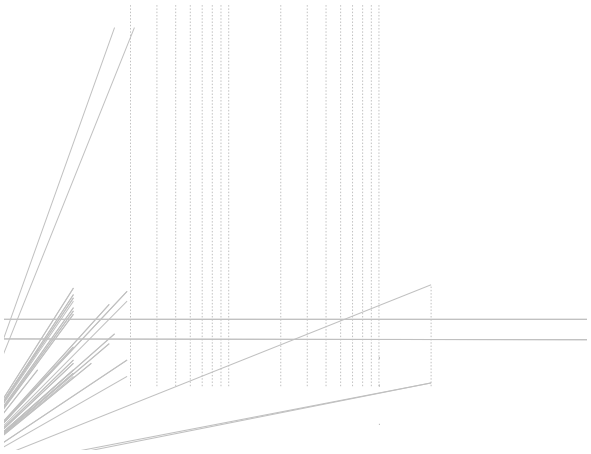


Fig. 16 Transient thermal impedance of IGBT

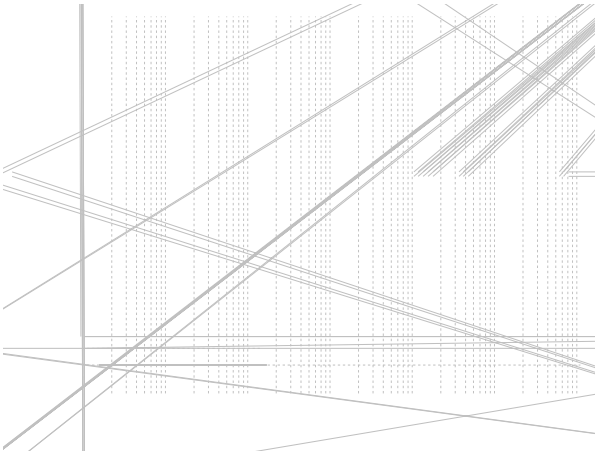
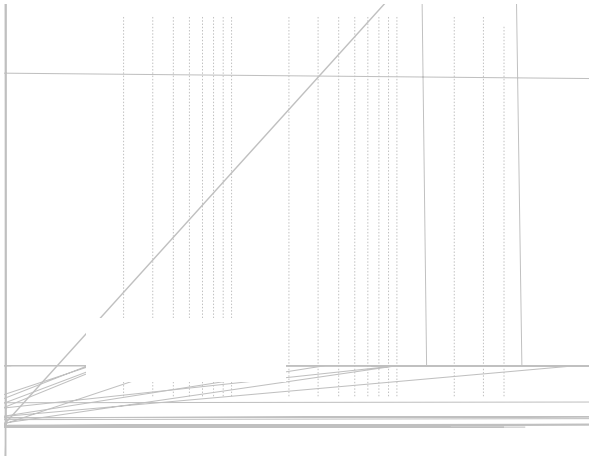
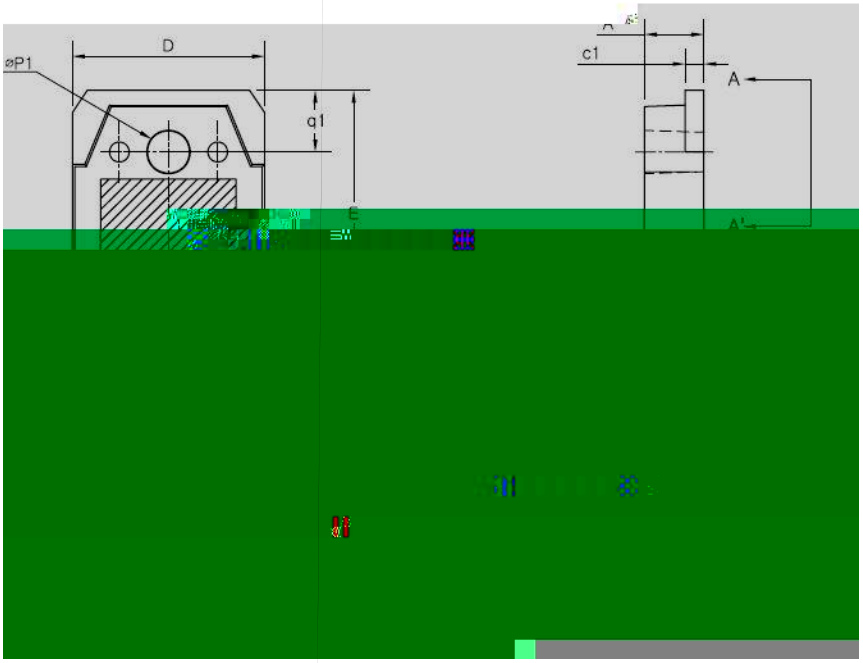
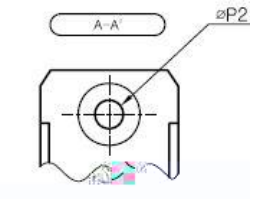


Fig. 17 Load Current vs. Frequency



TO-3PN MECHANICAL DATA





SYMBOL	MIN	NOM	MAX
A	4.60	4.80	5.00
b	0.80	1.00	1.20
b1	1.80	2.00	2.20
b2	2.80	3.00	3.20
c	0.55	0.60	0.75
c1	1.45	1.50	1.65
D	15.40	15.60	15.80
E	19.70	19.90	20.10
e	5.15	5.45	5.75
L1	3.30	3.50	3.70
L2	19.80	20.00	20.20
øP1	3.30	3.40	3.50
øP2		(3.20)	
Q	2.20	2.40	2.60
q1	4.80	5.00	5.20

Disclaimer

TRinno technology reserves the right to make changes without notice to produ4 54a1