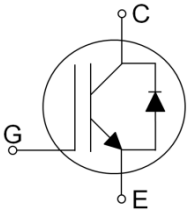
TGAN60N60F2DS
Field Stop Trench IGBT

Features
ÅÅ600V Field Stop Trench IGBT Technology
ÅÅLow Switching Loss for a Wide Temperature Range
ÅÅPositive Temperature Coefficient
ÅÅEasy Parallel Operation
ÅÅRoHS Compliant
ÅÅJEDEC Qualification



Applications
UPS, Welder, Inverter, Solar

Device	Package	Marking	Remark
TGAN60N60F2DS	TO-3PN	TGAN60N60F2DS	RoHS

Absolute Maximum Ratings

Parameter		Symbol	Value	Unit
Collector-Emitter Voltage		V_{CES}	600	V
Gate-Emitter Voltage		V_{GES}	20	V
Continuous Collector Current	T_C = 25 ℃	I_C	120	A
	T_C = 100 ℃		60	A
Pulsed Collector Current (Note 1)		I_{CM}	180	A
Diode Continuous Forward Current	T_C = 100 ℃	I_F	60	A
Diode Pulsed Current (Note 2)		I_{FM}	200	A
Power Dissipation	T_C = 25 ℃	P_D	357	W
	T_C = 100 ℃		143	W
Operating Junction Temperature		T_{vj}	-55 ~ 150	℃
Storage Temperature Range		T_{STG}	-55 ~ 150	℃
Maximum lead temperature for soldering purposes, 1/8òfrom case for 5 seconds		T_L	300	℃

Thermal Characteristics

Parameter	Symbol	Value	Unit
Maximum Thermal resistance, Junction-to-Case	$R_{đJC}$ (IGBT)	0.35	℃/W
Maximum Thermal resistance, Junction-to-Case	$R_{đJC}$ (DIODE)	1.12	℃/W
Maximum Thermal resistance, Junction-to-Ambient	$R_{đJA}$	40	℃/W

Electrical Characteristics of the IGBT T_{vj}=25 , unless otherwise noted

Parameter	Symbol	Test condition	Min.	Typ.	Max.	Unit
SWITCHING (Note 3)						
Turn-On Delay Time	$t_{d(on)}$	V_{CC} = 400V, I_C = 30A R_G = 5q , V_{GE} = 15V Inductive Load, T_{vj} = 150 ℃	--	27	--	ns
Rise Time	t_r		--	45	--	ns
Turn-Off Delay Time	$t_{d(off)}$		--	108	--	ns
Fall Time	t_f		--	17	--	ns
Turn-On Switching Loss	E_{ON}		--	1.36	--	mJ
Turn-Off Switching Loss	E_{OFF}		--	0.25	--	mJ
Total Switching Loss	E_{TS}		--	1.61	--	mJ
Turn-On Delay Time	$t_{d(on)}$	V_{CC} = 400V, I_C = 60A R_G = 5q , V_{GE} = 15V Inductive Load, T_{vj} = 150 ℃	--	31	--	ns
Rise Time	t_r		--	103	--	ns
Turn-Off Delay Time	$t_{d(off)}$		--	97	--	ns
Fall Time	t_f		--	52	--	ns
Turn-On Switching Loss	E_{ON}		--	3.20	4.80	mJ
Turn-Off Switching Loss	E_{OFF}		--	0.68	1.02	mJ
Total Switching Loss	E_{TS}		--	3.88	5.82	mJ

Not subject to production test ï verified by design/characterization

Electrical Characteristics of the DIODE T_{vj}=25 , unless otherwise noted

Parameter	Symbol	Test condition	Min.	Typ.	Max.	Unit
Diode Forward Voltage	V_{FM}	I_F				

IGBT Characteristics

Fig. 1 IGBT Output Characteristics

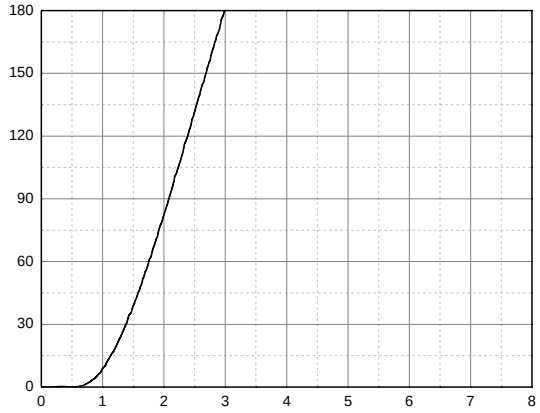


Fig. 2 IGBT Output Characteristics

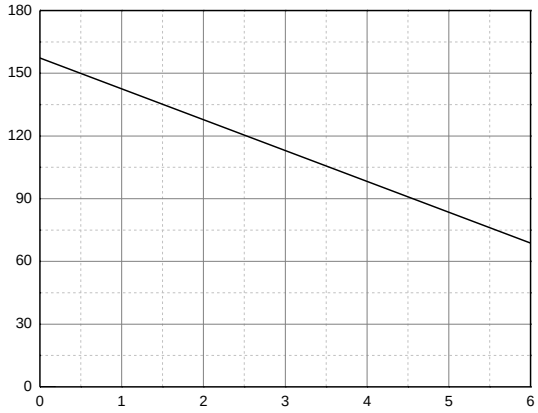


Fig. 3 IGBT Saturation Voltage vs. Junction Temperature

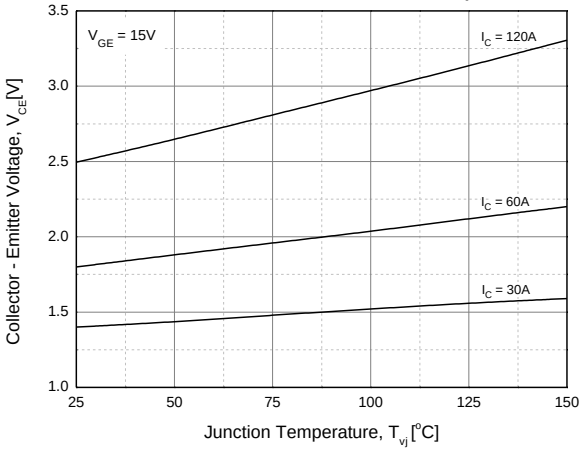


Fig. 4 IGBT Saturation Voltage vs. Gate Bias

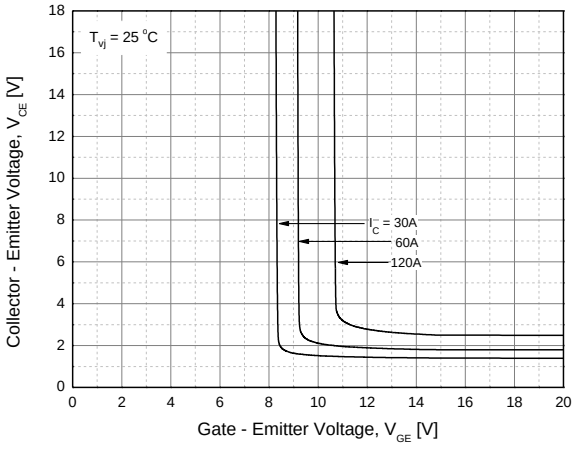


Fig. 5 IGBT Saturation Voltage vs. Gate Bias

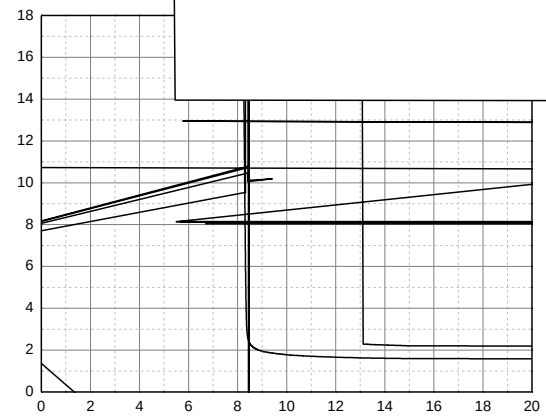


Fig. 6 IGBT Capacitance Characteristics

IGBT Characteristics

Fig. 7 Turn-on Time vs. Gate Resistor

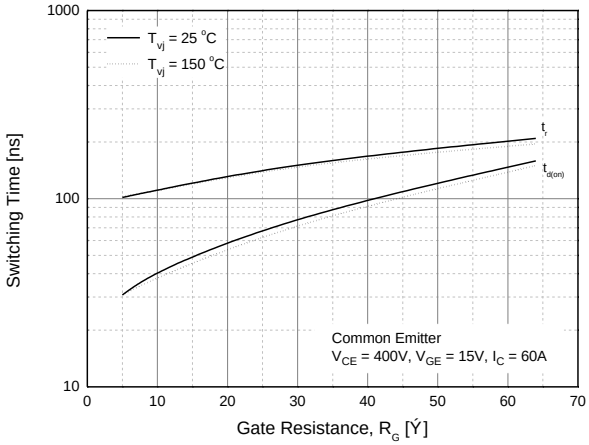


Fig. 8 Turn-off Time vs. Gate Resistor

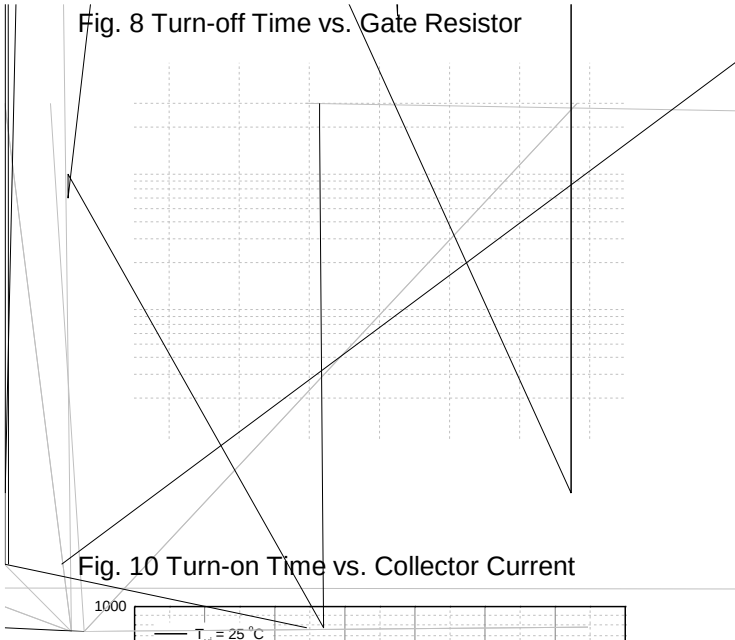
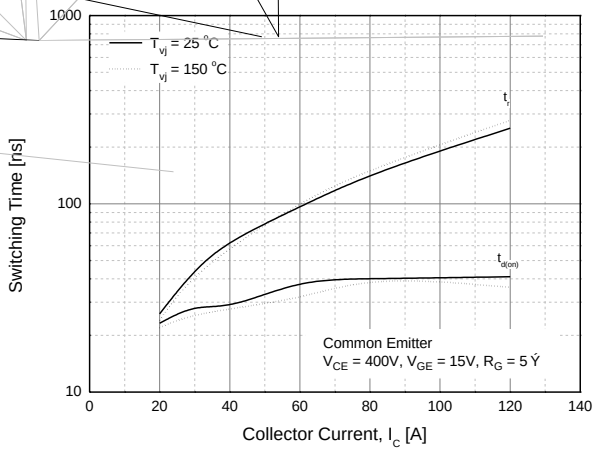


Fig. 10 Turn-on Time vs. Collector Current



[redacted]

ent

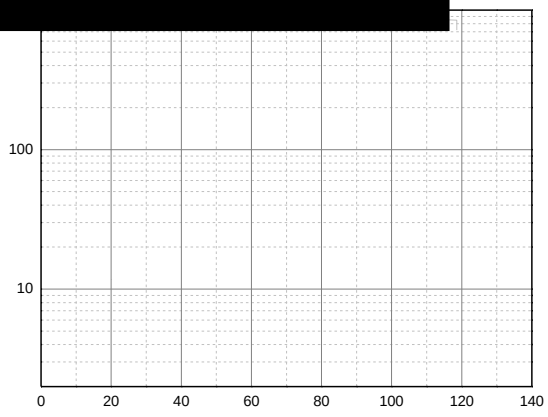
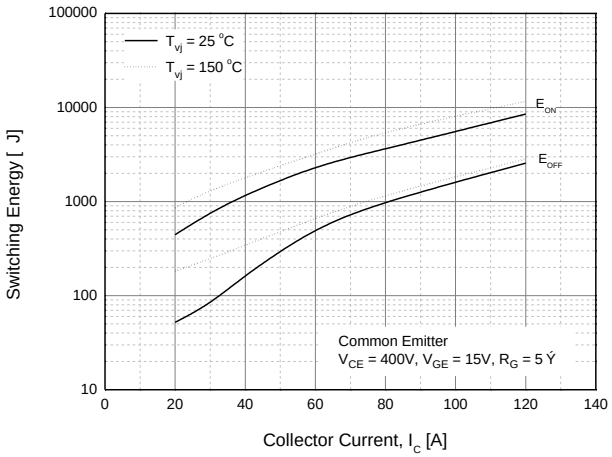


Fig. 12 Switching Loss vs. Collector Current



IGBT Characteristics

Fig. 13 Gate Charge Characteristics

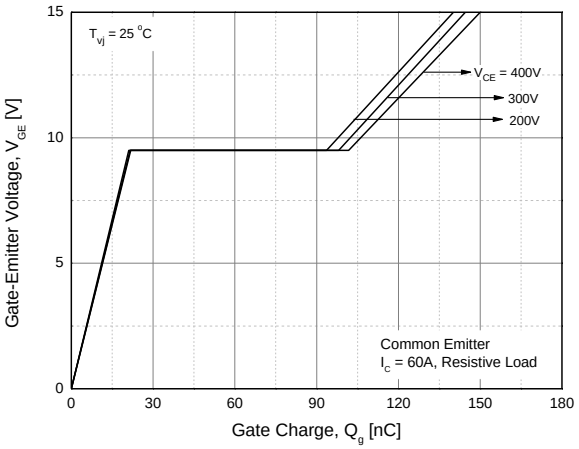


Fig. 14 SOA

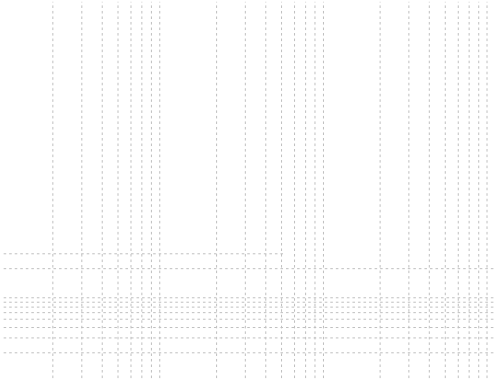


Fig. 15 RBSOA

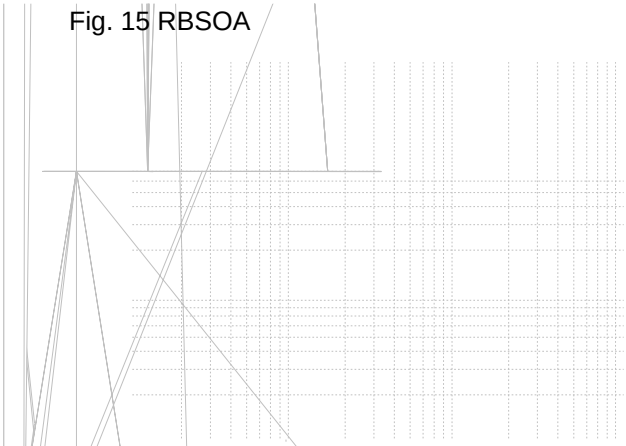


Fig. 16 Transient Thermal Impedance of IGBT

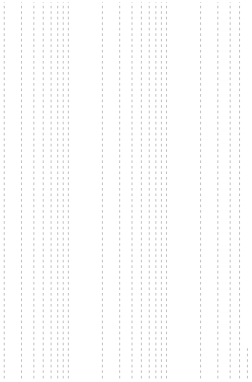


Fig. 17 Load Current vs. Frequency

Diode Characteristics

Fig. 18 Diode Conduction Characteristics

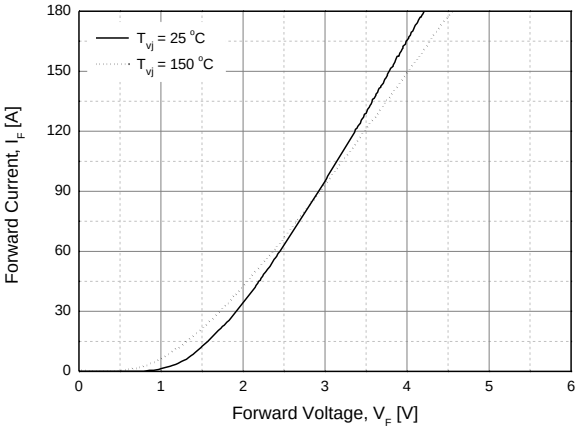


Fig. 19 Reverse Recovery Current vs. Forward Current

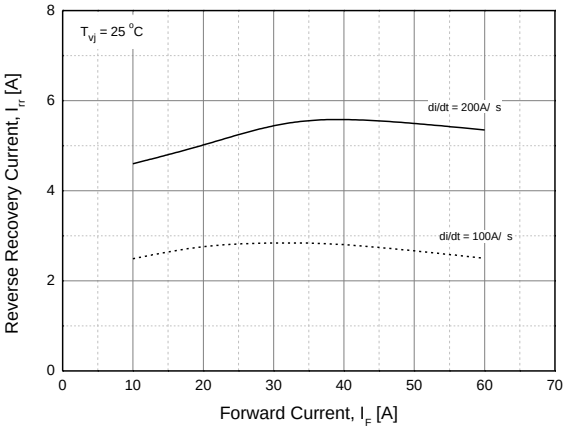


Fig. 20 Reverse Recovery Charge vs. Forward Current

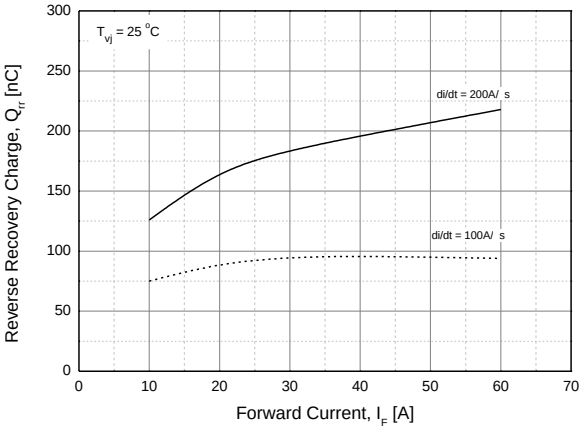
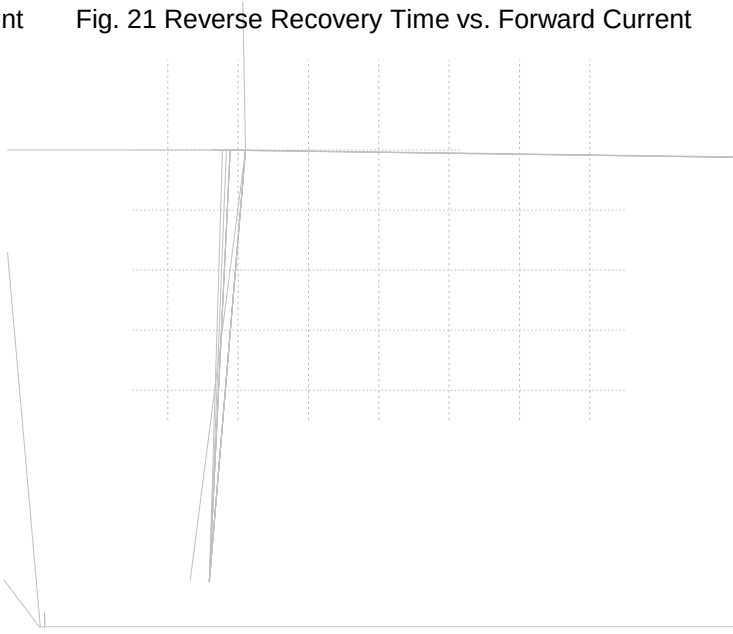
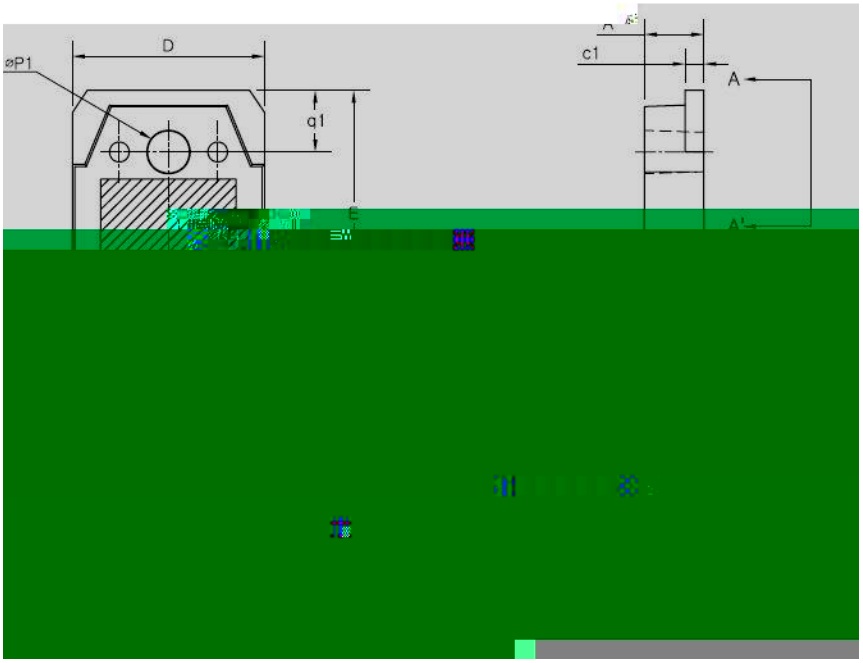
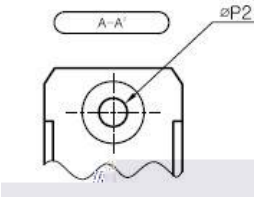


Fig. 21 Reverse Recovery Time vs. Forward Current



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
		(3.20)	
Q		2.40	2.60
q1	4.80	5.00	5.20

Disclaimer

TRinno technology reserves the right to make changes without notice to products herein to improve reliability, performance, or design. The information given in this document is believed to be accurate and reliable. However, it shall in no event be regarded as a guarantee of conditions and characteristics. With respect to any information regarding the application of the device, TRinno technology hereby disclaims any and all warranties and liabilities of any kind, including without limitation, warranties of non-infringement of patent rights of any third party.