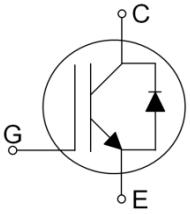
TGAN40N60F2D
Field Stop Trench IGBT

Features
ÅÂ600V Field Stop Trench IGBT Technology
ÅÂLow Conduction Loss
ÅÂPositive Temperature Coefficient
ÅÂEasy Parallel Operation
ÅÂRoHS Compliant
ÅÂJEDEC Qualification



Applications
UPS, Welder, Inverter, Solar

Device	Package	Marking	Remark
TGAN40N60F2D	TO-3PN	TGAN40N60F2D	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	80	A
	T_C = 100 ℃		40	A
Pulsed Collector Current (Note 1)		I_{CM}	120	A
Diode Continuous Forward Current	T_C = 100 ℃	I_F	20	A
Diode Pulsed Forward Current (Note 2)		I_{FM}	200	A
Power Dissipation	T_C = 25 ℃	P_D	236	W
	T_C = 100 ℃		94	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_{dJC} (IGBT)	0.53	℃/W
Maximum Thermal resistance, Junction-to-Case	R_{dJC} (DIODE)	1.43	℃/W
Maximum Thermal resistance, Junction-to-Ambient	R_{dJA}	40	℃/W

Electrical Characteristics of the IGBT T_{vj}=25

Parameter	Symbol	Test condition	Min.	Typ.	Max.	Unit
Diode Forward Voltage	V_{FM}	I_F = 20A, T_{vj} = 25 ℃	--	1.70	--	V
		I_F = 20A, T_{vj} = 150 ℃	--	1.46	--	V
		I_F = 40A, T_{vj} = 25 ℃	--	2.10	--	V
		I_F = 40A, T_{vj} = 150 ℃	--	1.95	--	V
Reverse Recovery Time	t_{rr}	I_F = 20A, di/dt = 200A/μs, T_{vj} = 25 ℃	--	58	--	ns
Reverse Recovery Current	I_{rr}		--	5.0	--	A
Reverse Recovery Chaq0.0000.l40 720 reW*nBT/F1 9 Tf1 0 0 1 66.816 4(Cha)-5/F1 9 Tf1 0 0 1 471.5 513.02 Tm0 g0 G 0.003 T						
Reverse Recovery Current	I					A

IGBT Characteristics

Fig. 1 IGBT Output Characteristics

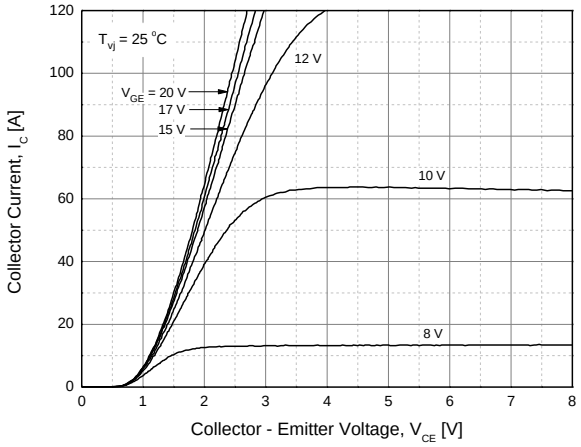


Fig. 2 IGBT Output Characteristics

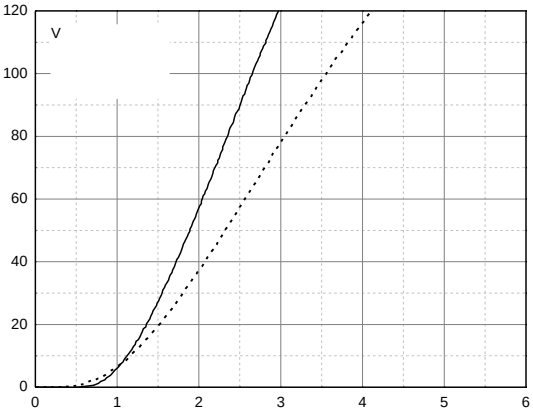


Fig. 3 IGBT Saturation Voltage vs. Junction Temperature

Fig. 4 IGBT Saturation Voltage vs. Gate Bias

Fig. 5 IGBT Saturation Voltage vs. Gate Bias

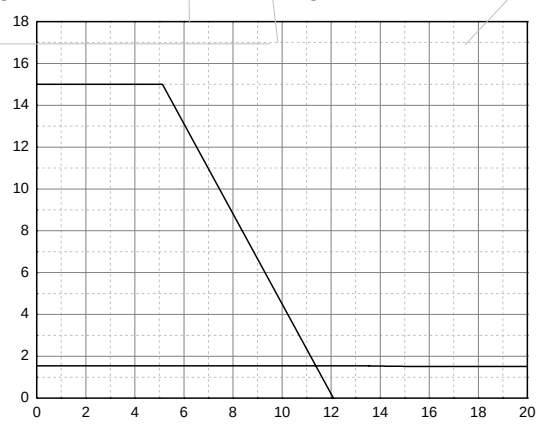


Fig. 6 IGBT Capacitance Characteristics

IGBT Characteristics

Fig. 7 Turn-on Time vs. Gate Resistor

Fig. 8 Turn-off Time vs. Gate Resistor

Fig. 9 Switching Loss vs. Gate Resistor

Fig. 10 Turn-on Time vs. Collector Current

Fig. 11 Turn-off Time vs. Collector Current

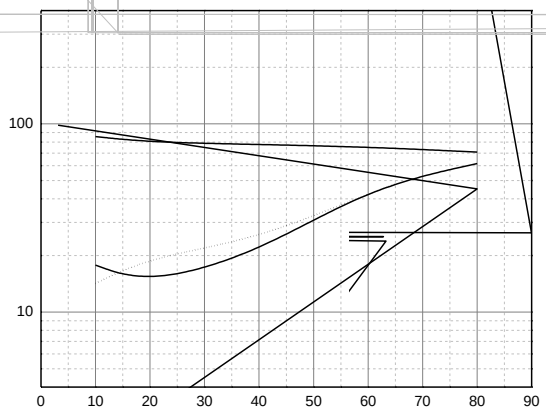


Fig. 12 Switching Loss vs. Collector Current

IGBT Characteristics

Fig. 13 Gate Charge Characteristics

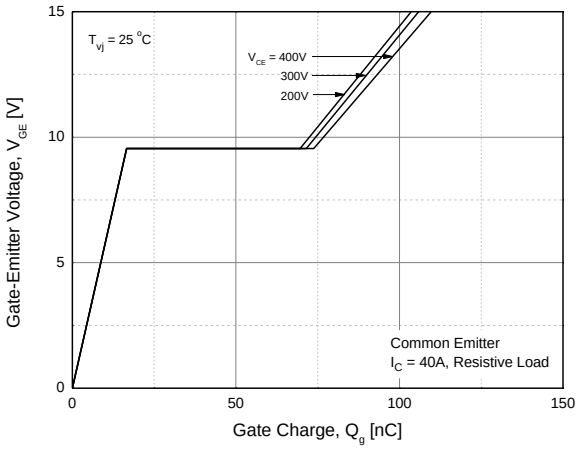


Fig. 14 SOA

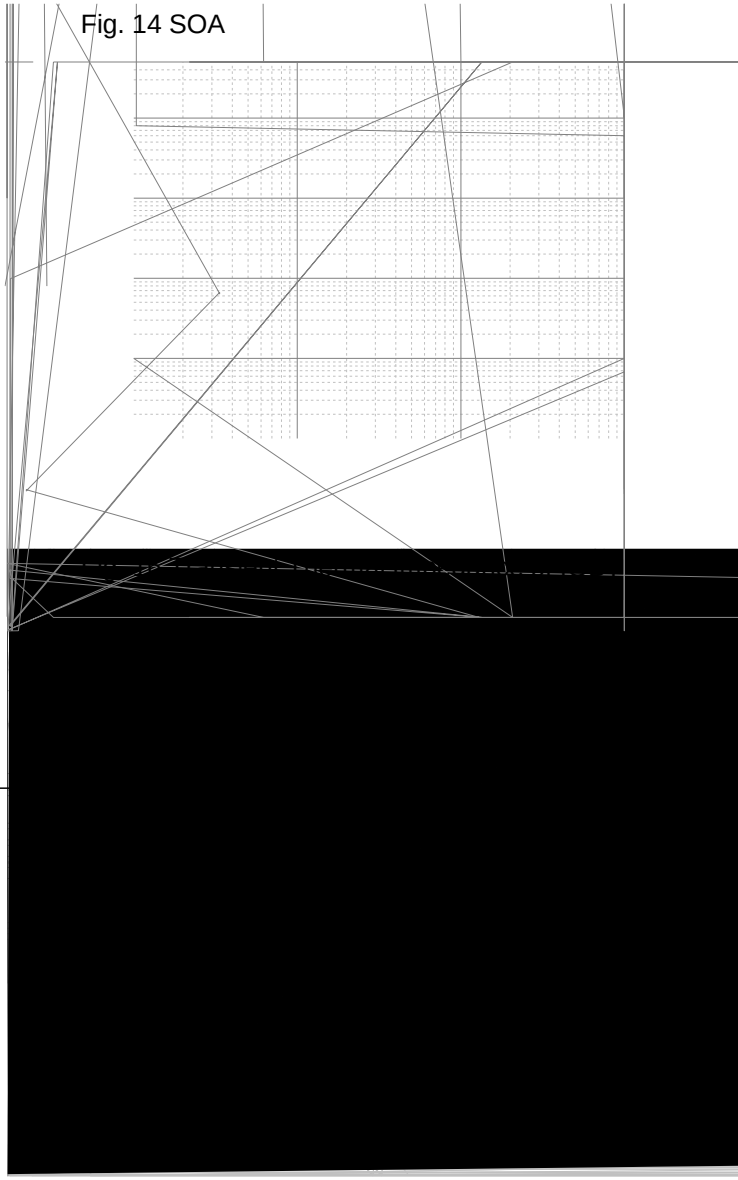


Fig. 15 RBSOA

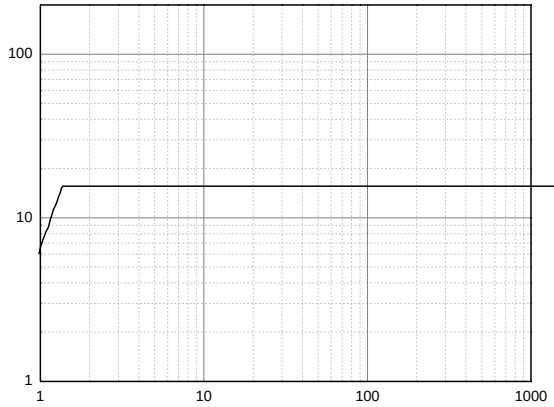
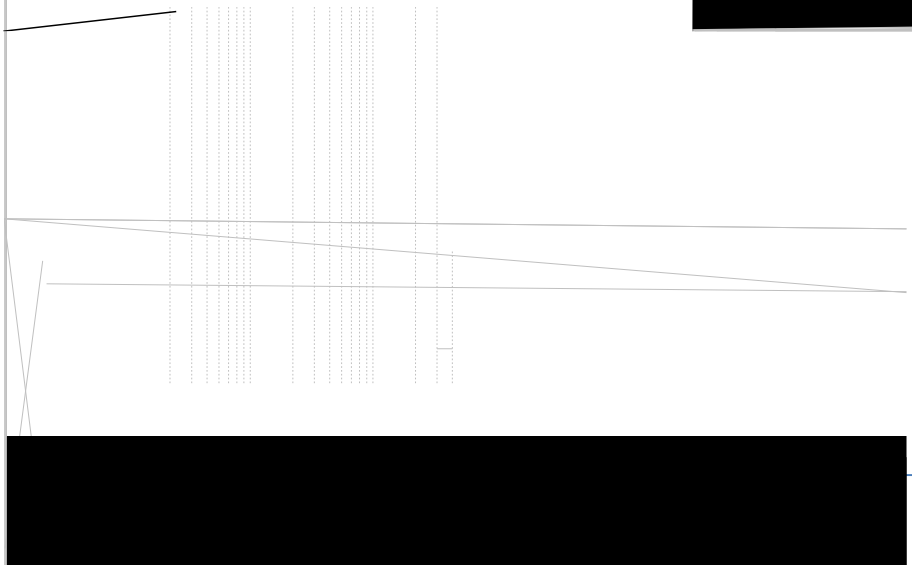


Fig. 17 Load Current vs. Frequency



Diode Characteristics

Fig. 18 Diode Conduction Characteristics

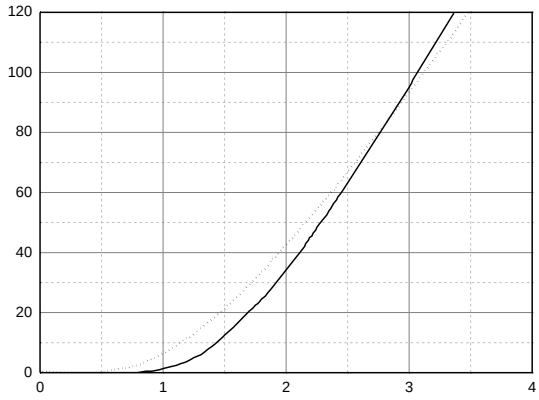
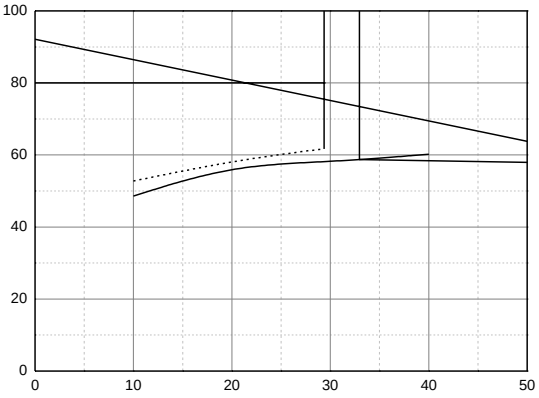


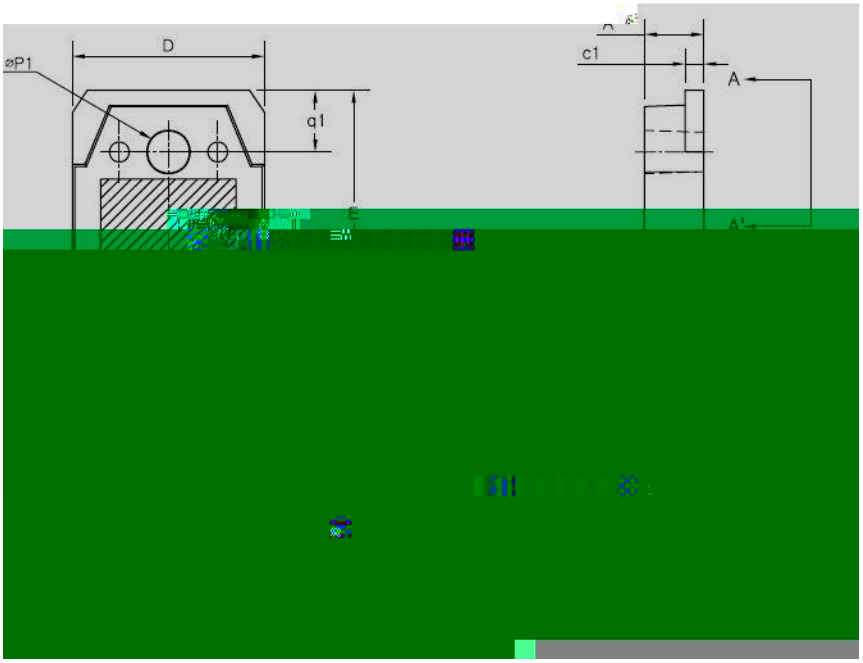
Fig. 19 Reverse Recovery Current vs. Forward Current

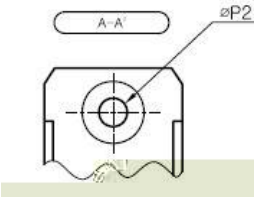
Fig. 20 Reverse Recovery Charge vs. Forward Current

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	2.6
q1	4.80	5.00	5.2

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