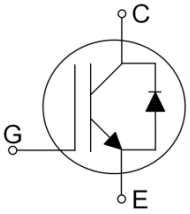
TGAN30S160FD

Reverse Conducting Field Stop Trench IGBT

Features



175℃ Operating Temperature
RoHS Compliant
JEDEC Qualification

Applications

Induction Heating
Inverterized microwave ovens
Soft Switching Applications

Device	Package	Marking	Remark
TGAN30S160FD	TO-3PN	TGAN30S160FD	RoHS

Absolute Maximum Ratings

Parameter		Symbol	Value	Unit
Collector-Emitter Voltage		V_{CES}	1600	V
Gate-Emitter Voltage		V_{GES}	25	V
Continuous Collector Current	T_C = 25 ℃	I_C	60	A
	T_C = 100 ℃		30	A
Pulsed Collector Current (Note 1)		I_{CM}	180	A
Diode Continuous Forward Current	T_C = 100 ℃	I_F	30	A
Power Dissipation	T_C = 25 ℃	P_D	300	W
	T_C = 100 ℃		150	W
Operating Junction Temperature		T_{vj}	-55 ~ 175	℃
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_{JC} (IGBT)	0.50	℃/W
Maximum Thermal resistance, Junction-to-Case	R_{JC} (DIODE)	0.50	℃/W
Maximum Thermal resistance, Junction-to-Ambient	R_{JA}	40	℃/W

Electrical Characteristics T_{vj} =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	1600	--	--	V
Zero Gate Voltage Collector Current	I_{CES}	V_{CE} = 1600V, V_{GE} = 0V	--	--	1	mA
Gate Emitter Leakage Current	I_{GES}	V_{CE} = 0V, V_{GE} = ± 25V	--	--	± 500	nA
Integrated Gate Resistor	$R_{G(int)}$	f = 1MHz, open Collector	--	6	--	
ON						
Gate Emitter Threshold Voltage	$V_{GE(TH)}$	V_{GE} = V_{CE}, I_C = 30mA	5.0	6.5	8.0	V
Collector Emitter Saturation Voltage	$V_{CE(SAT)}$	V_{GE} = 15V, I_C = 30A, T_{vj} = 25 ℃	--	2.25	2.65	V
		V_{GE} = 15V, I_C = 30A, T_{vj} = 125 ℃	--	2.65	--	V
		V_{GE} = 15V, I_C = 30A, T_{vj} = 175 ℃	--	2.88	--	V
Diode Forward Voltage	V_{FM}	I_F = 30A, T_{vj} = 25 ℃	--	2.53	--	V
		I_F = 30A, T_{vj} = 125 ℃	--	2.81	--	V
		I_F = 30A, T_{vj} = 175 ℃	--	3.01	--	V
DYNAMIC						
Input Capacitance	C_{IES}	V_{CE} = 30V, V_{GE} = 0V f = 1MHz	--	3655	--	pF
Output Capacitance	C_{OES}		--	58	--	pF
Reverse Transfer Capacitance	C_{RES}		--	45	--	pF
SWITCHING (Note 2)						
Turn-Off Delay Time	$t_{d(off)}$	V_{CC} = 600V, I_C = 30A R_G = 10 , V_{GE} = 15V Inductive Load, T_{vj} = 25 ℃	--	237	--	ns
Fall Time	t_f		--	78	117	ns
Turn-Off Switching Loss	E_{OFF}		--	1.02		

Device Characteristics

Fig. 1 IGBT Output Characteristics

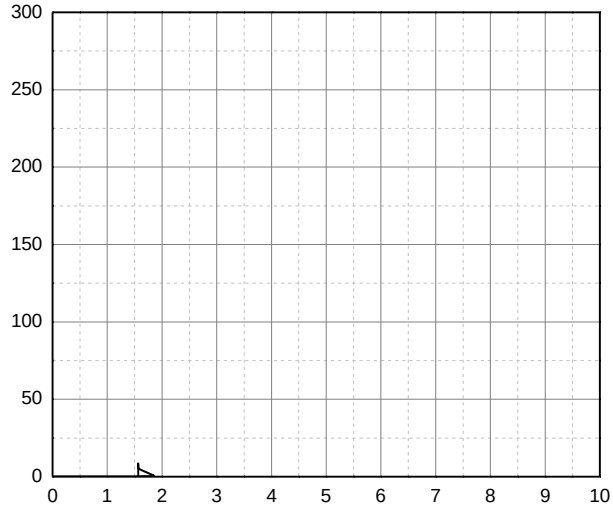


Fig. 2 IGBT Output Characteristics

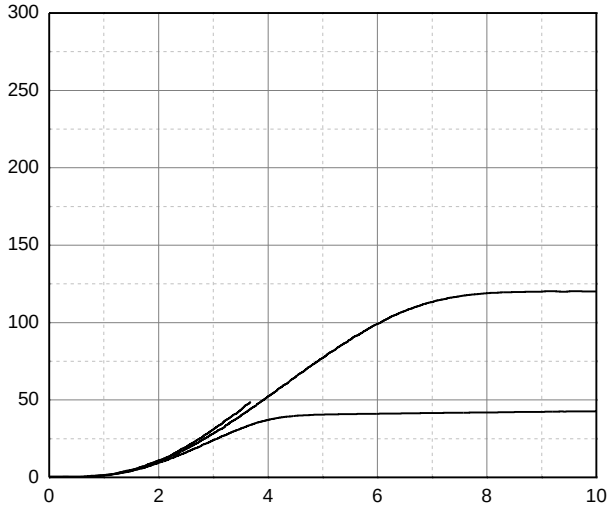


Fig. 3 IGBT Saturation Voltage vs. Junction Temperature

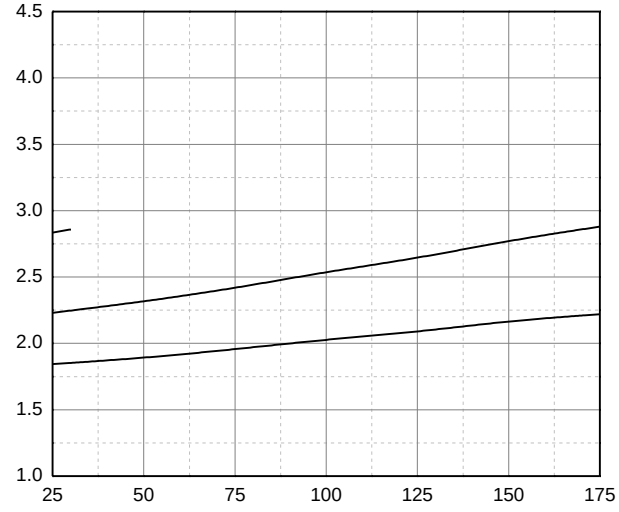


Fig. 4 IGBT Threshold Voltage vs. Junction Temperature

Device Characteristics

Fig. 9 Turn-off Time vs. Gate Resistor

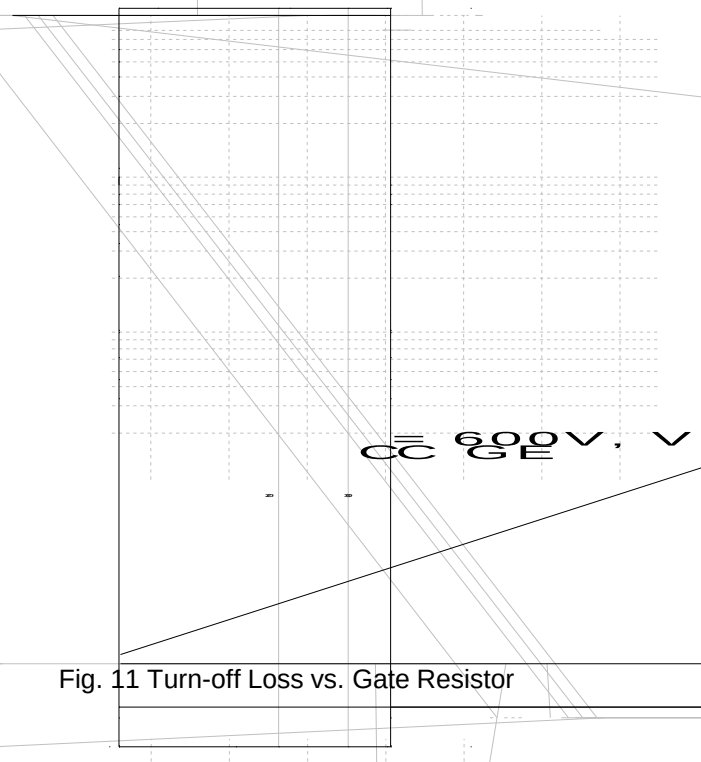


Fig. 10 Turn-off Time vs. Collector Current

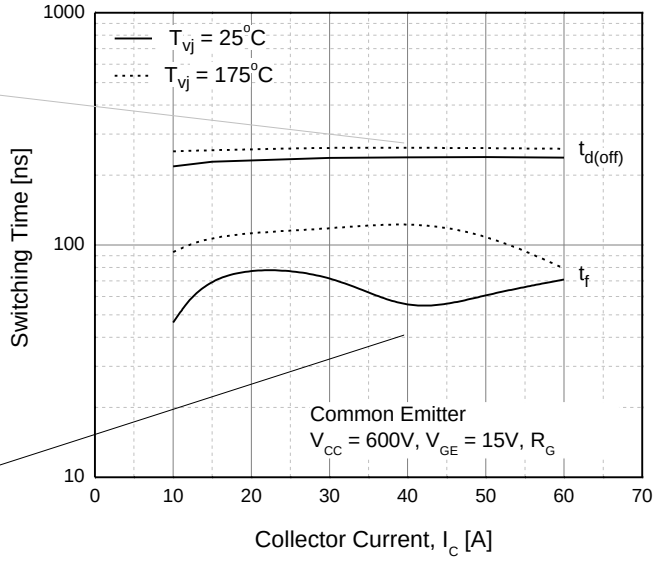
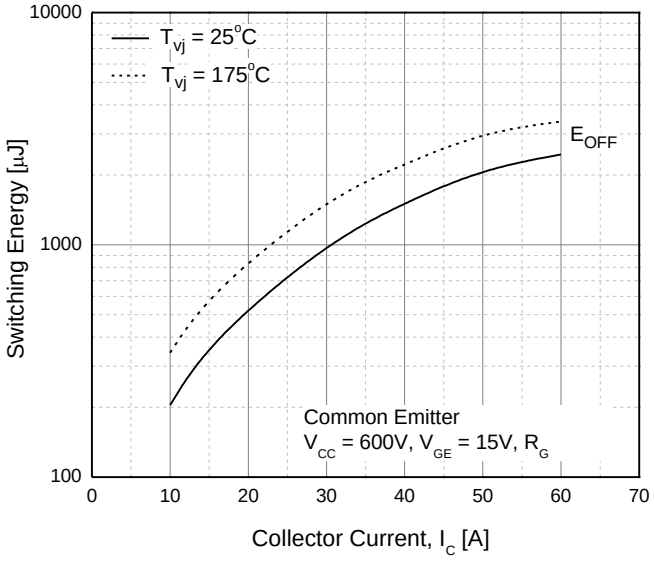


Fig. 11 Turn-off Loss vs. Gate Resistor

Fig. 12 Turn-off Loss vs. Collector Current



Device Characteristics

Fig. 13 Gate Charge Characteristics

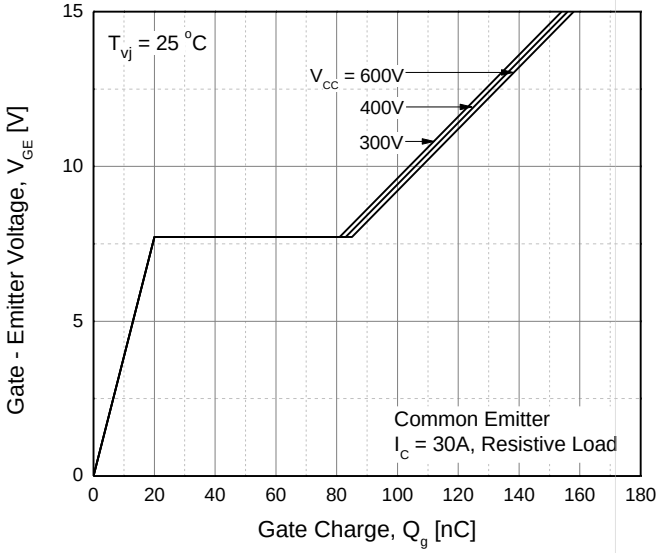


Fig. 14 Transient Thermal Impedance

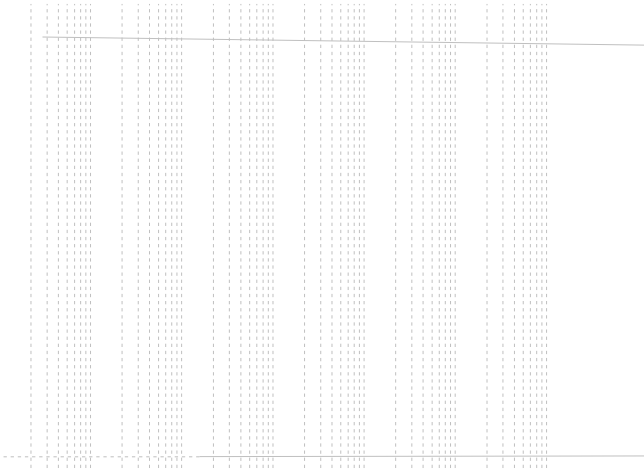


Fig. 15 Power Dissipation vs. Case Temperature

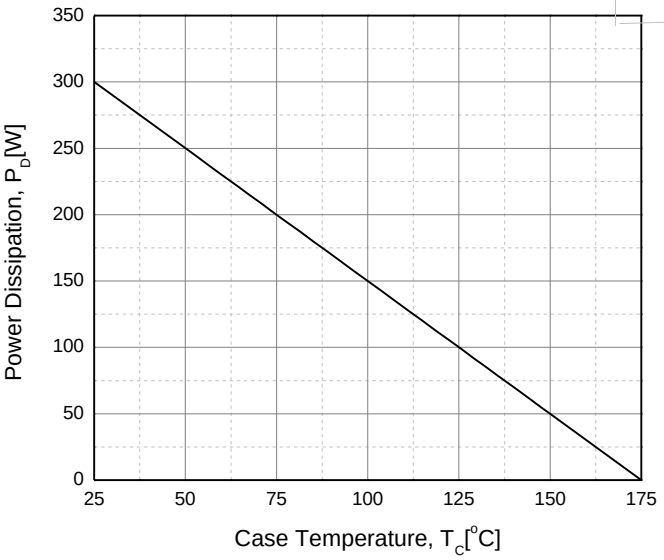
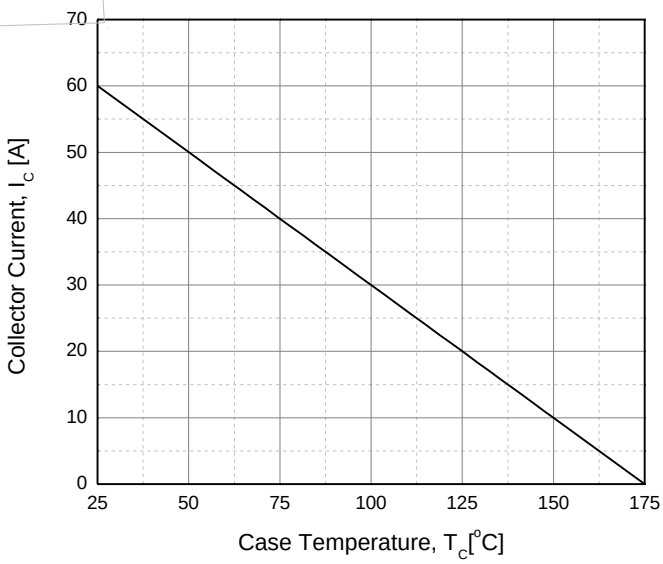


Fig. 16 Collector Current vs. Case Temperature



Device Characteristics

Fig. 17 SOA

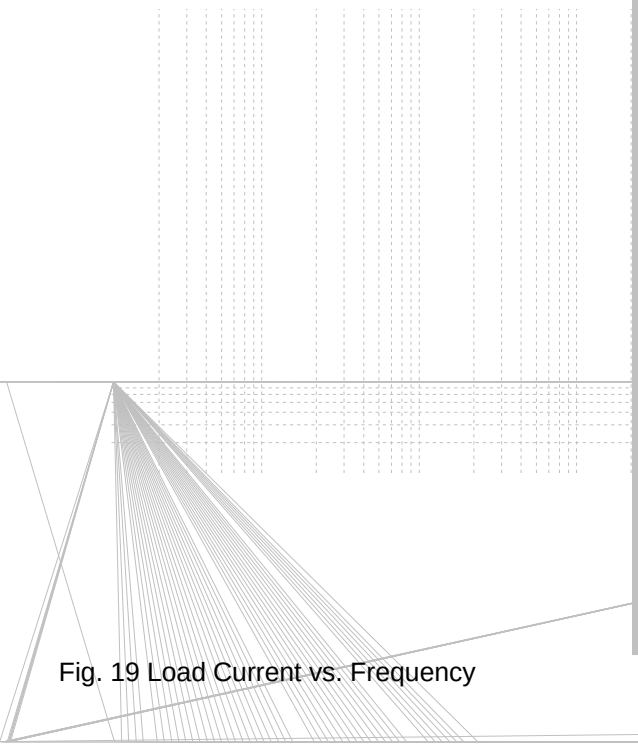
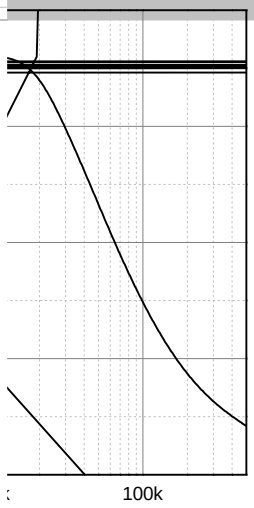


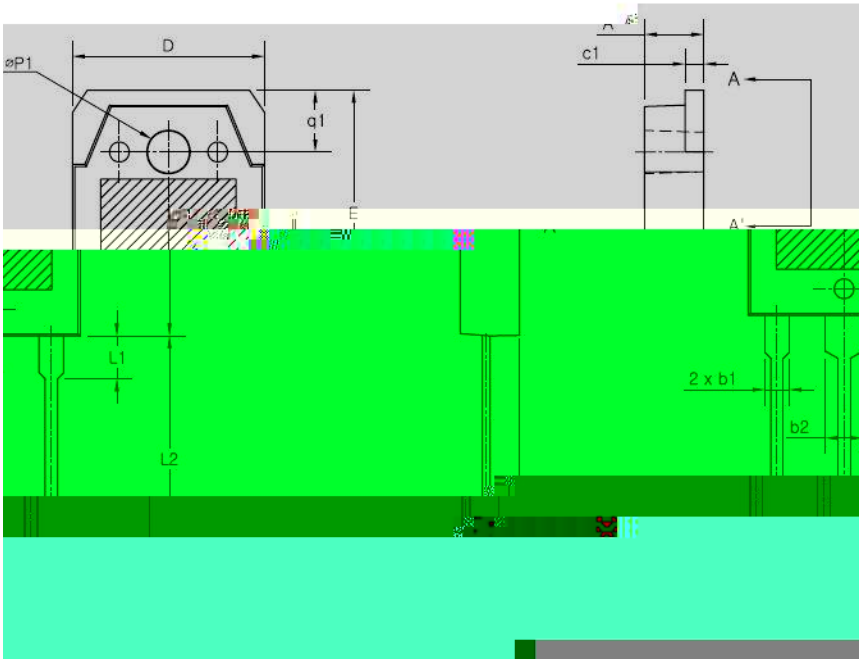
Fig. 18 RBSOA

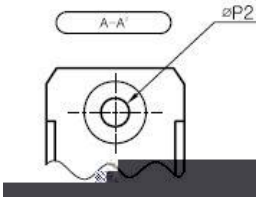
Fig. 19 Load Current vs. Frequency

Fig. 20 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
[illegible]	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
[illegible]		(3.20)	
Q	[illegible]	2.40	2.6
q1	4.80	5.00	5.2

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