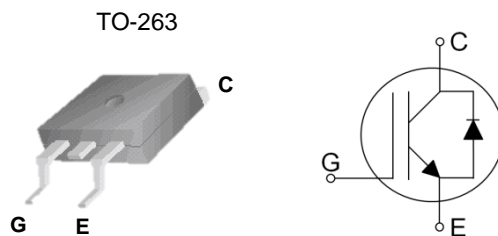


Features

- 600V Field Stop Trench IGBT Technology
- High Speed Switching
- Low Conduction Loss
- Positive Temperature Coefficient
- Easy Parallel Operation
- Short Circuit Withstanding Time 5 s
- 175 Operating Temperature
- RoHS Compliant
- JEDEC Qualification



Applications

Motor Drive, Air Conditioner, Inverter, Solar

Device	Package	Marking	Remark
TGB30N60FDRS	TO-263	TGB30N60FDRS	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	I_C	$T_C = 25$	60	A
		$T_C = 100$	30	A
Pulsed Collector Current ^(Note 1)	I_{CM}	90	A	
Diode Continuous Forward Current	I_F	30	A	
Diode Pulsed Forward Current ^(Note 1)	I_{FM}	100	A	
Power Dissipation	P_D	$T_C = 25$	120	W
		$T_C = 100$	60	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)	1.25	/W
Maximum Thermal resistance, Junction-to-Case	R_{JC} (DIODE)	2.35	/W
Maximum Thermal resistance, Junction-to-Ambient	R_{JA}	40	/W

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

Parameter	Symbol	Test condition	Min.	Typ.	Max.	Unit
Diode Forward Voltage	V_{FM}	$I_F = 15A, T_{vj} = 25$	--	1.90	--	V
		$I_F = 15A, T_{vj} = 125$	--	1.69	--	V
		$I_F = 15A, T_{vj} = 175$	--	1.58	--	V
		$I_F = 30A, T_{vj} = 25$	--	2.40	--	V
		$I_F = 30A, T_{vj} = 125$	--	2.25	--	V
		$I_F = 30A, T_{vj} = 175$	--	2.21	--	V
Reverse Recovery Time	t_{rr}	$I_F = 15A,$ $di/dt = 200A/\mu s,$ $T_{vj} = 25$	--	50	--	ns
Reverse Recovery Current	I_{rr}		--	4.8	--	A
Reverse Recovery Charge	Q_{rr}		--	143	--	nC
Reverse Recovery Time	t_{rr}	$I_F = 15A,$ $di/dt = 200A/\mu s,$ $T_{vj} = 175$	--	121	--	ns
Reverse Recovery Time	t_{rr}		--	504.72	447.24	ns

IGBT Characteristics

Fig. 1 IGBT Output Characteristics

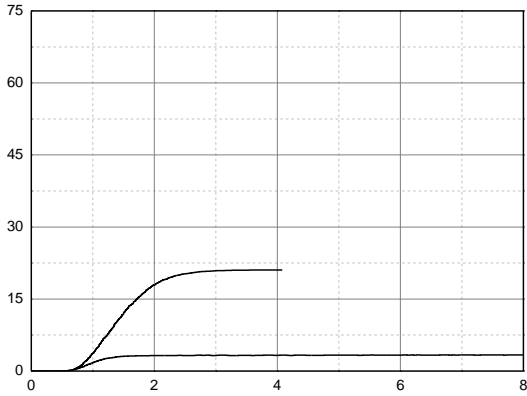


Fig. 2 IGBT Output Characteristics



Fig. 3 IGBT Saturation Voltage vs. Junction Temperature

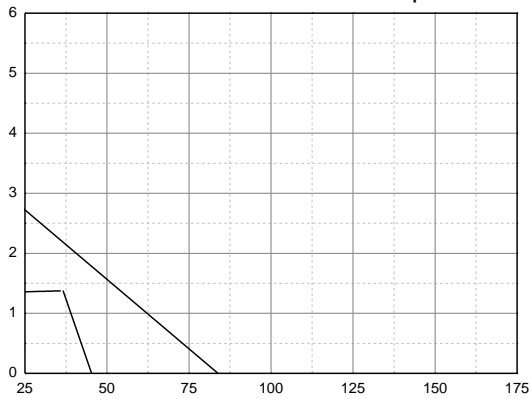


Fig. 4 IGBT Saturation Voltage vs. Gate Bias

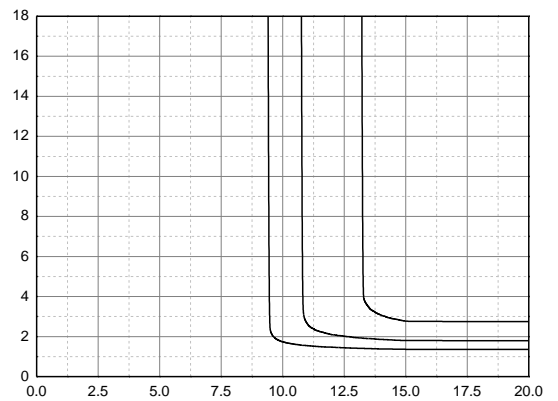


Fig. 5 IGBT Saturation Voltage vs. Gate Bias

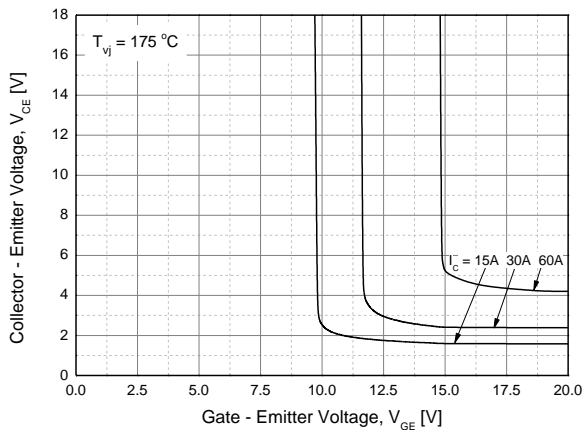
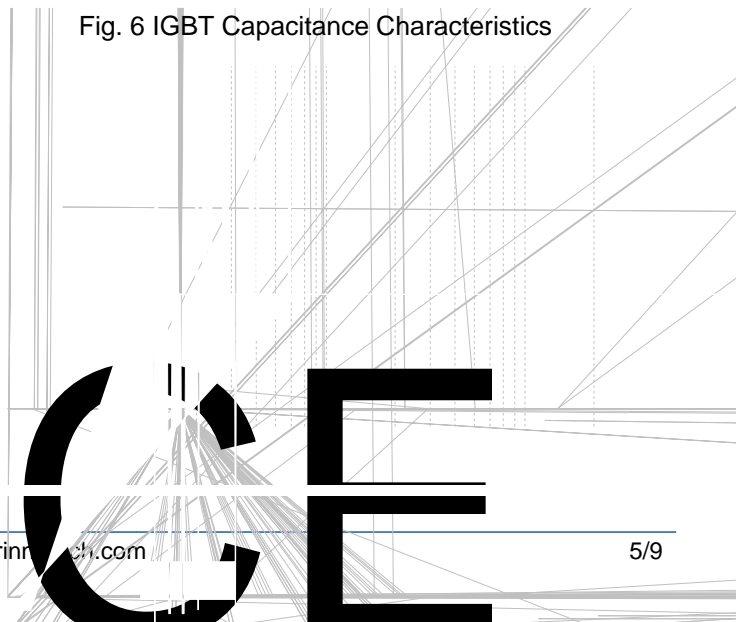


Fig. 6 IGBT Capacitance Characteristics



IGBT Characteristics

Fig. 7 Turn-on Time vs. Gate Resistor

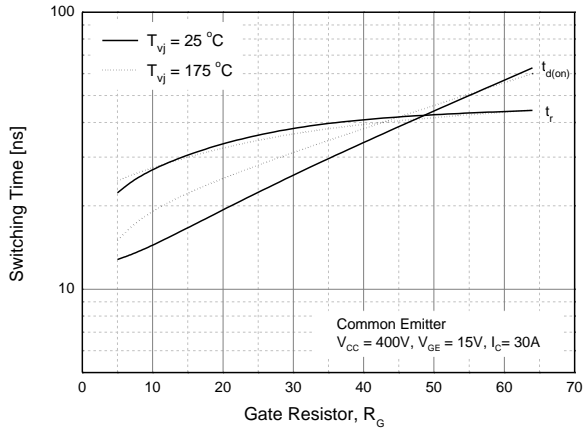


Fig. 8 Turn-off Time vs. Gate Resistor



Fig. 9 Switching Loss vs. Gate Resistor

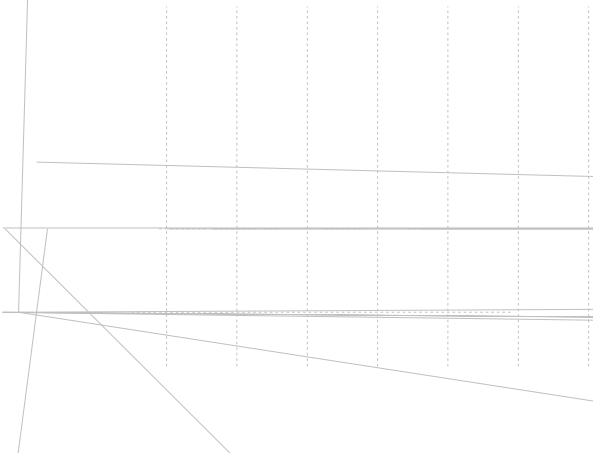


Fig. 10 Turn-on Time vs. Collector Current

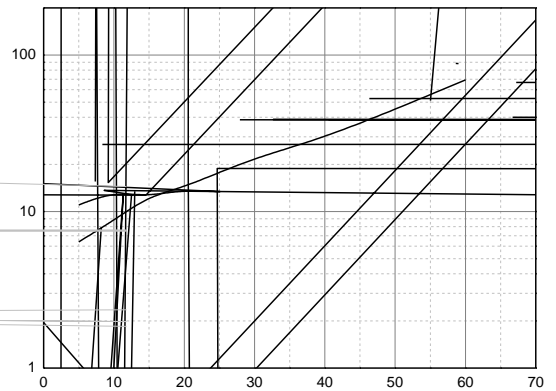


Fig. 11 Turn-off Time vs. Collector Current

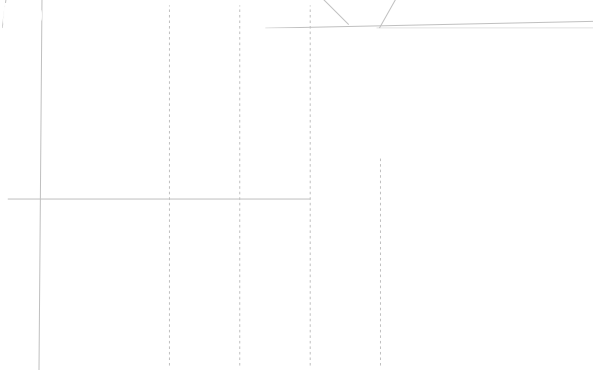
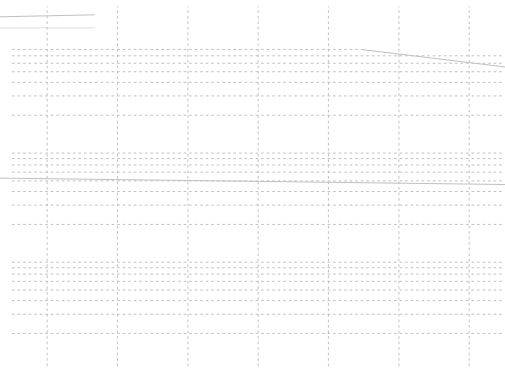


Fig. 12 Switching Loss vs. Collector Current



IGBT Characteristics

Fig. 13 Gate Charge Characteristics

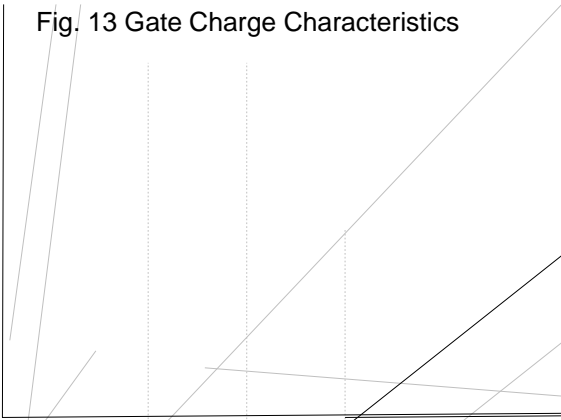


Fig. 14 SOA

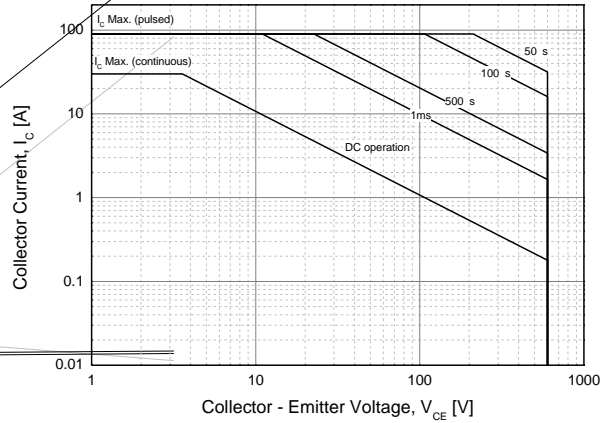


Fig. 15 RBSOA

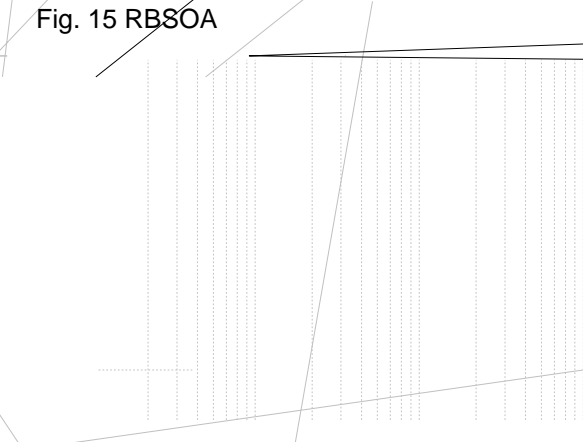


Fig. 16 Transient Thermal Impedance of IGBT

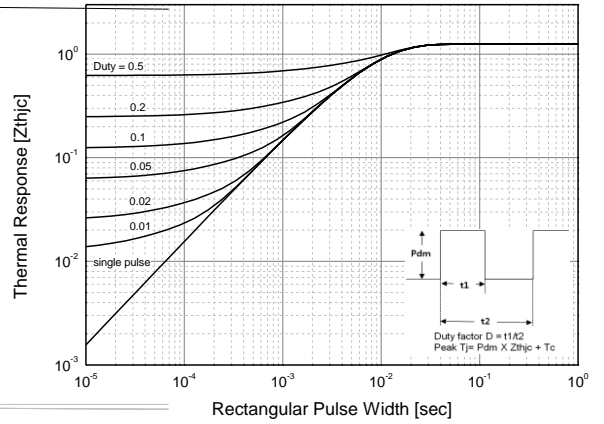
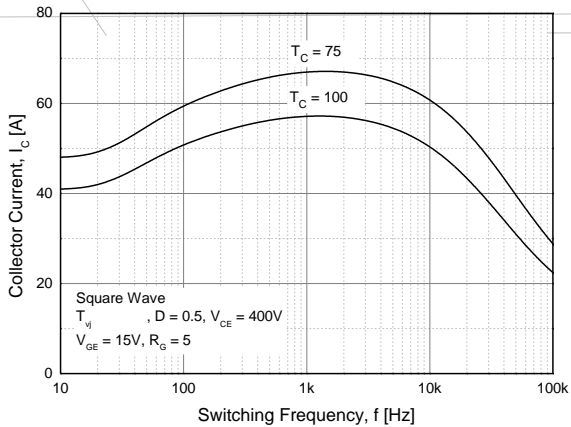


Fig. 17 Load Current vs. Frequency



DIODE Characteristics

Fig. 18 Diode Conduction Characteristics

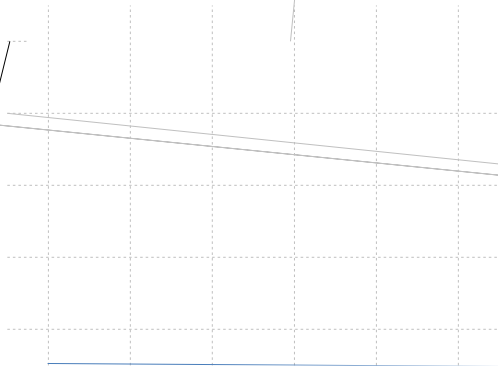
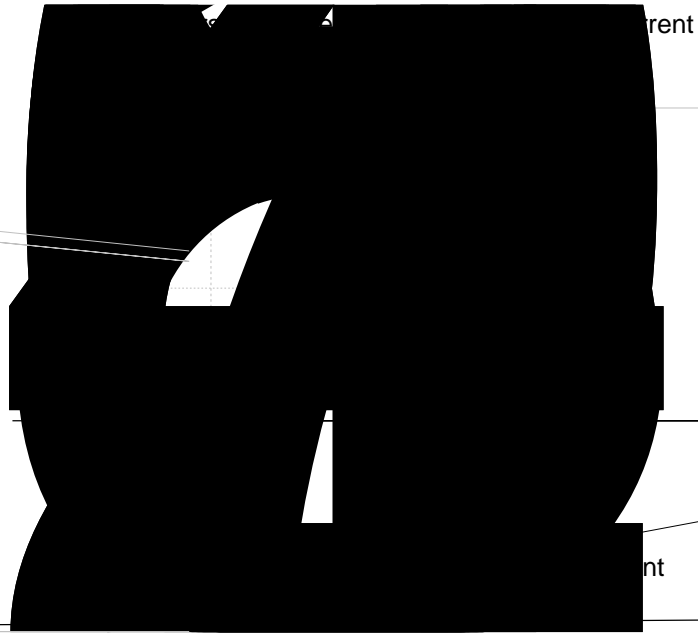
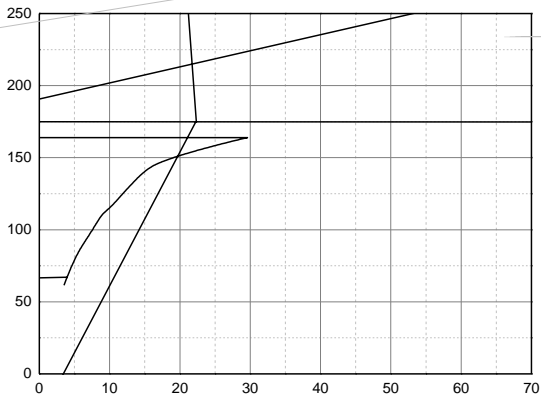


Fig. 20 Reverse Recovery Charge vs. Forward Current



TO-263 MECHANICAL DATA

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