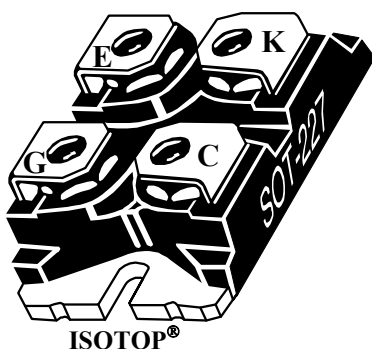
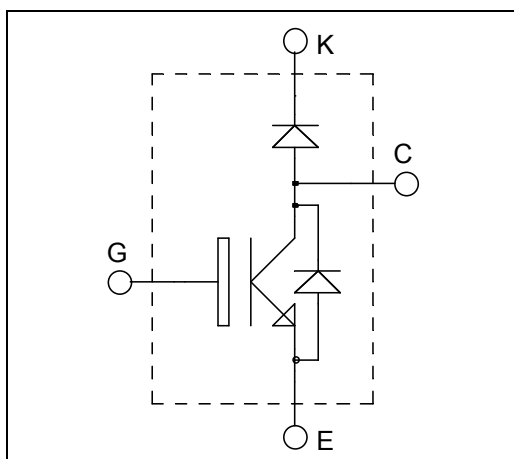


**ISOTOP® Boost chopper
High speed Trench + Field Stop IGBT4
Power Module**

**$V_{CES} = 650V$
 $I_C = 100A^* @ T_c = 80^\circ C$**



Application

- AC and DC motor control
- Switched Mode Power Supplies
- Power Factor Correction
- Brake switch

Features

- **High speed Trench + Field Stop IGBT 4**
 - Low voltage drop
 - Low leakage current
 - Low switching losses
- ISOTOP® Package (SOT-227)
- Very low stray inductance

Benefits

- Low conduction losses
- Stable temperature behavior
- Direct mounting to heatsink (isolated package)
- Low junction to case thermal resistance
- Easy paralleling due to positive T_C of V_{CEsat}
- RoHS Compliant

All ratings @ $T_j = 25^\circ C$ unless otherwise specified

Absolute maximum ratings

Symbol	Parameter	Max ratings	Unit
V_{CES}	Collector - Emitter Voltage	650	V
I_C	Continuous Collector Current	$T_C = 25^\circ C$ 165*	A
		$T_C = 80^\circ C$ 100*	
I_{CM}	Pulsed Collector Current	$T_C = 25^\circ C$ 270	
V_{GE}	Gate - Emitter Voltage	± 20	V
P_D	Power Dissipation	430	W

* Specification of IGBT device but output current must be limited due to size of output pins.

 **CAUTION:** These Devices are sensitive to Electrostatic Discharge. Proper Handling Procedures Should Be Followed.

Electrical Characteristics

Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit
I_{CES}	Zero Gate Voltage Collector Current	$V_{GE} = 0V, V_{CE} = 650V$			50	μA
$V_{CE(sat)}$	Collector Emitter Saturation Voltage	$V_{GE} = 15V$ $I_C = 100A$	$T_j = 25^\circ C$ $T_j = 150^\circ C$	1.4 2.2	2.3	V
$V_{GE(th)}$	Gate Threshold Voltage	$V_{GE} = V_{CE}, I_C = 1.6 mA$	4.2	5.1	5.6	V
I_{GES}	Gate – Emitter Leakage Current	$V_{GE} = 20V, V_{CE} = 0V$			150	nA

Dynamic Characteristics

Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit
C_{ies}	Input Capacitance	$V_{GE} = 0V$		6100		pF
C_{oes}	Output Capacitance	$V_{CE} = 25V$		232		
C_{res}	Reverse Transfer Capacitance	$f = 1MHz$		180		
Q_G	Gate charge	$V_{GE} = 15V, I_C = 100A$ $V_{CE} = 480V$		630		nC
$T_{d(on)}$	Turn-on Delay Time	Inductive Switching (25°C) $V_{GE} = \pm 15V$ $V_{Bus} = 400V$ $I_C = 100A$ $R_G = 3.6\Omega$		19		ns
T_r	Rise Time			33		
$T_{d(off)}$	Turn-off Delay Time			197		
T_f	Fall Time			21		
$T_{d(on)}$	Turn-on Delay Time	Inductive Switching (150°C) $V_{GE} = \pm 15V$ $V_{Bus} = 400V$ $I_C = 100A$ $R_G = 3.6\Omega$		19		ns
T_r	Rise Time			29		
$T_{d(off)}$	Turn-off Delay Time			227		
T_f	Fall Time			22		
E_{on}	Turn on Energy	$V_{GE} = \pm 15V$ $V_{Bus} = 400V$	$T_j = 150^\circ C$	2.4		mJ
E_{off}	Turn off Energy	$I_C = 100A$ $R_G = 3.6\Omega$	$T_j = 150^\circ C$	2		
R_G	Integrated gate resistor			2		Ω
I_{sc}	Short Circuit data	$V_{GE} \leq 15V ; V_{Bus} = 400V$ $t_p \leq 5\mu s ; T_j = 150^\circ C$		700		A
R_{thJC}	Junction to Case Thermal Resistance				0.35	$^\circ C/W$

Chopper diode ratings and characteristics

Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit
V_{RRM}	Peak Repetitive Reverse Voltage				650	V
I_{RM}	Reverse Leakage Current	$V_R = 650V$			50	μA
I_F	DC Forward Current		$T_c = 60^\circ C$	50		A
V_F	Diode Forward Voltage	$I_F = 50A$ $V_{GE} = 0V$	$T_j = 25^\circ C$ $T_j = 150^\circ C$	1.6 1.5	2	V
t_{rr}	Reverse Recovery Time	$I_F = 50A$ $V_R = 300V$ $di/dt = 1800A/\mu s$	$T_j = 25^\circ C$ $T_j = 150^\circ C$	100 150		ns
Q_{rr}	Reverse Recovery Charge		$T_j = 25^\circ C$ $T_j = 150^\circ C$	2.6 5.4		
E_{rr}	Reverse Recovery Energy		$T_j = 25^\circ C$ $T_j = 150^\circ C$	0.6 1.2		mJ
R_{thJC}	Junction to Case Thermal Resistance				1.14	$^\circ C/W$

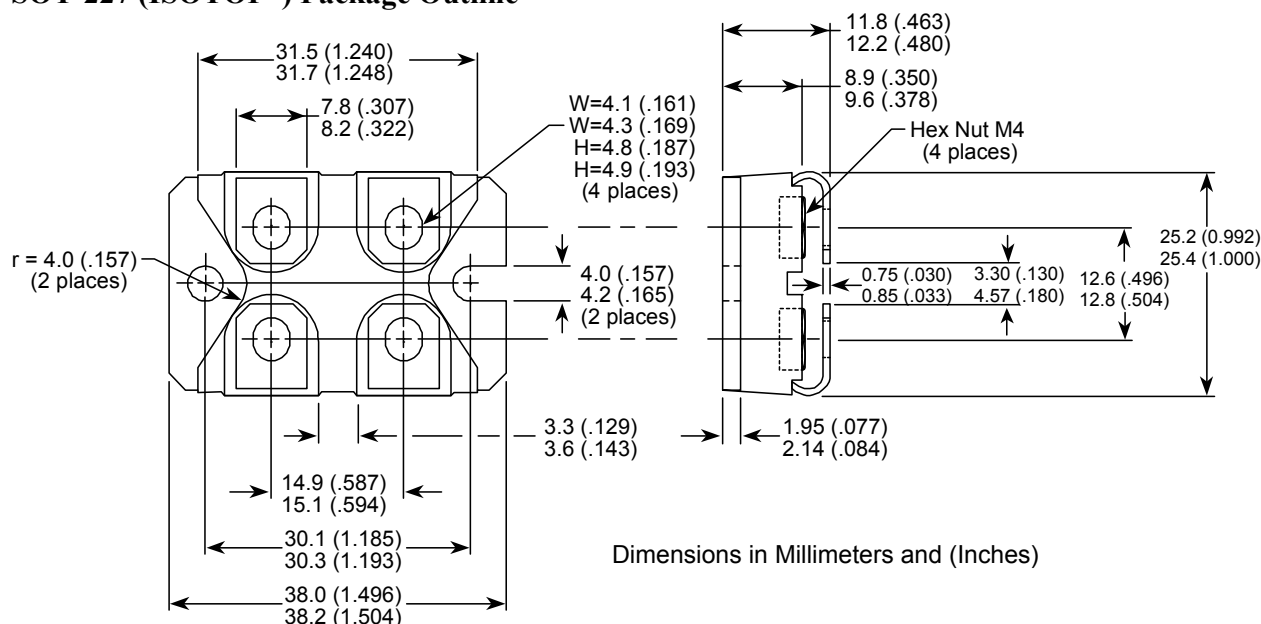
IGBT parallel diode ratings and characteristics

Symbol	Characteristic	Test Conditions		Min	Typ	Max	Unit
V _{RRM}	Peak Repetitive Reverse Voltage					650	V
I _{RM}	Reverse Leakage Current	V _R = 650V				50	μA
I _F	DC Forward Current		T _c = 60°C		20		A
V _F	Diode Forward Voltage	I _F = 20A V _{GE} = 0V	T _j = 25°C		1.6	2	V
			T _j = 150°C		1.5		
t _{rr}	Reverse Recovery Time	I _F = 20A V _R = 300V di/dt = 1600A/μs	T _j = 25°C		100		ns
			T _j = 150°C		150		
Q _{rr}	Reverse Recovery Charge		T _j = 25°C		1.1		μC
			T _j = 150°C		2.3		
E _{rr}	Reverse Recovery Energy		T _j = 25°C		0.23		mJ
			T _j = 150°C		0.50		
R _{thJC}	Junction to Case Thermal Resistance					2.6	°C/W

Thermal and package characteristics

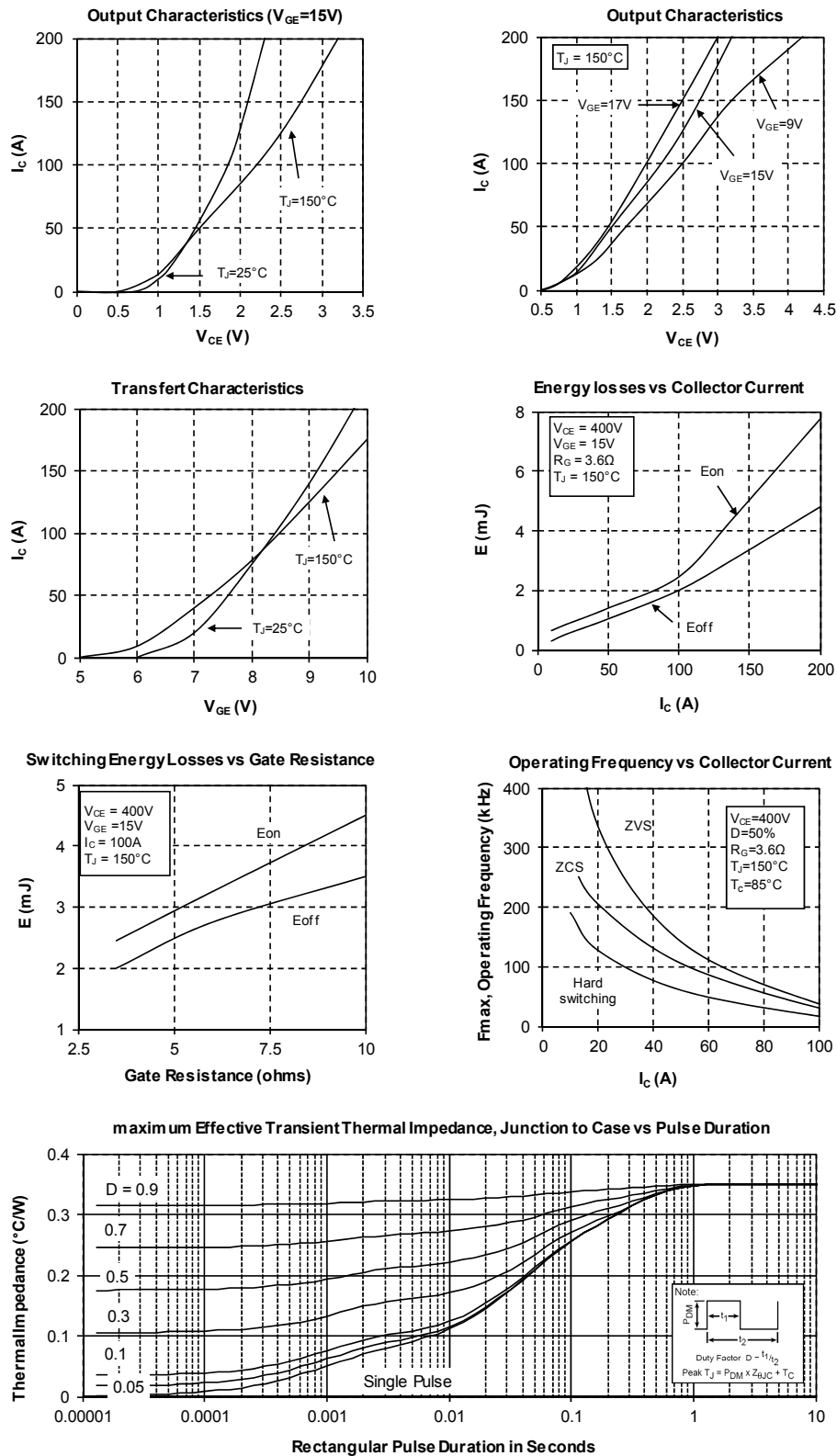
Symbol	Characteristic	Min	Typ	Max	Unit
V_{ISOL}	RMS Isolation Voltage, any terminal to case $t = 1$ min, 50/60Hz	2500			V
T_J, T_{STG}	Storage Temperature Range	-55		175	$^\circ C$
T_{JOP}	Recommended junction temperature under switching conditions	-55		T_{jmax} -25	
T_L	Max Lead Temp for Soldering: 0.063" from case for 10 sec			300	
Torque	Mounting torque (Mounting = 8-32 or 4mm Machine and terminals = 4mm Machine)			1.5	N.m
Wt	Package Weight		29.2		g

SOT-227 (ISOTOP®) Package Outline

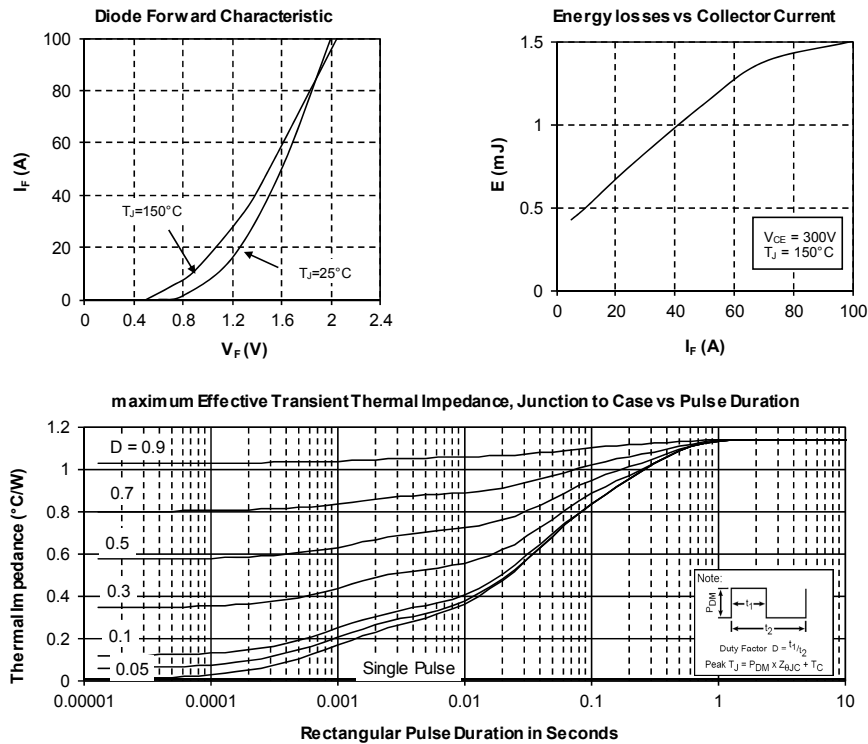


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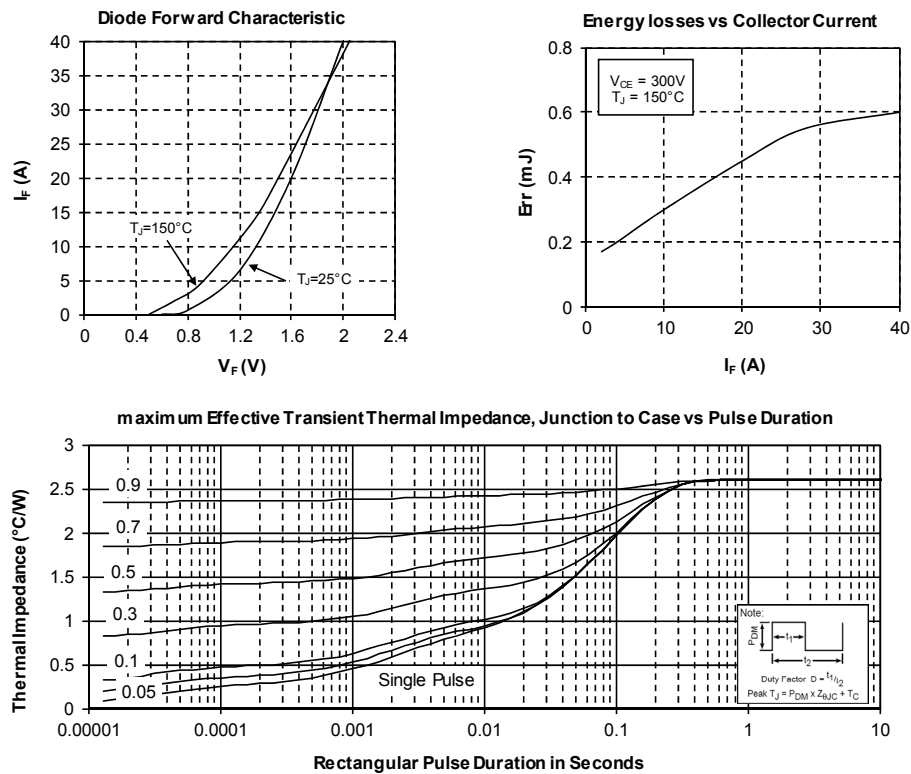
IGBT Typical Performance Curves



Chopper diode Typical Performance Curves



IGBT parallel diode Typical Performance Curves



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