RECTRON SEMICONDUCTOR
TECHNICAL SPECIFICATION

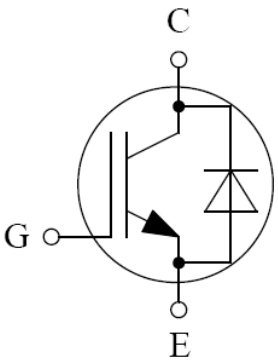
RI20N1200TT

1200V/20A RC-IGBT

General Description

DOSEMI IGBT Power Discrete provides ultra low conduction loss as well as low switching loss. They are designed for the applications such as inductive cooking.

Equivalent Circuit Schematic

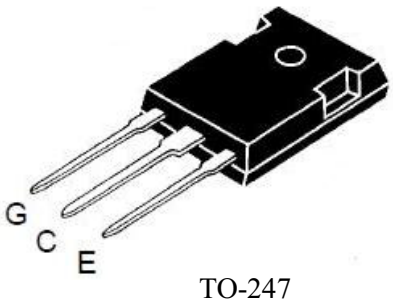


Features

- Low $V_{CE(sat)}$ Trench IGBT technology
- Low switching loss
- Maximum junction temperature 175°C
- Low inductance case
- $V_{CE(sat)}$ with positive temperature coefficient
- Fast & soft reverse recovery anti-parallel FWD
- Lead free package

Typical Applications

- Inductive cooking



TO-247

Absolute Maximum Ratings T_C=25°C unless otherwise noted

Symbol	Description	Value	Unit
V_{CES}	Collector-Emitter Voltage	1200	V
V_{GES}	Gate-Emitter Voltage	±20	V
I_C	Collector Current @ T_C=25°C @ T_C=100°C	40 20	A
I_{CM}	Pulsed Collector Current t_p=1ms	60	A
P_D	Maximum Power Dissipation @ T_j=175°C	395	W

Diode

Symbol	Description	Value	Unit
V_{RRM}	Repetitive Peak Reverse Voltage	1200	V
I_F	Diode Continuous Forward Current	20	A
I_{FM}	Diode Maximum Forward Current t_p=1ms	60	A

Discrete

Symbol	Description	Values	Unit
T_{jop}	Operating Junction Temperature	-40 to +175	°C
T_{STG}	Storage Temperature Range	-40 to +175	°C
T_S	Soldering Temperature,1.6mm from case for 10s	260	°C
M	Mounting Torque, Screw M3	0.6	N.m

IGBT Characteristics T_C=25°C unless otherwise noted

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$V_{CE(sat)}$	Collector to Emitter Saturation Voltage	I_C=20A,V_{GE}=15V, T_j=25°C		1.75	1.95	V
		I_C=20A,V_{GE}=15V, T_j=125°C		2.00		
		I_C=20A,V_{GE}=15V, T_j=175°C		2.20		
$V_{GE(th)}$	Gate-Emitter Threshold Voltage	I_C=0.40mA,V_{CE}=V_{GE}, T_j=25°C	5.1	5.8	6.4	V
I_{CES}	Collector Cut-Off Current	V_{CE}=V_{CES},V_{GE}=0V, T_j=25°C			0.1	mA
I_{GES}	Gate-Emitter Leakage Current	V_{GE}=V_{GES},V_{CE}=0V, T_j=25°C			100	nA
R_{Gint}	Internal Gate Resistance			0		Ω
$t_{d(off)}$	Turn-Off Delay Time	V_{CC}=600V,I_C=20A, R_G=15Ω,V_{GE}=0/15V, T_j=25°C		345		ns
t_f	Fall Time			52		ns
E_{off}	Turn-Off Switching Loss			0.80		mJ
$t_{d(off)}$	Turn-Off Delay Time	V_{CC}=600V,I_C=20A, R_G=15Ω,V_{GE}=0/15V, T_j=175°C		426		ns
t_f	Fall Time			90		ns
E_{off}	Turn-Off Switching Loss			1.45		mJ

Diode Characteristics T_C=25°C unless otherwise noted

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V_F	Diode Forward Voltage	I_F=20A,V_{GE}=0V,T_j=25°C		1.70	1.90	V
		I_F=20A,V_{GE}=0V,T_j=125°C		1.80		
		I_F=20A,V_{GE}=0V,T_j=175°C		2.00		

Discrete Characteristics T_C=25°C unless otherwise noted

Symbol	Parameter	Min.	Typ.	Max.	Unit
R_{thJC}	Junction-to-Case (per IGBT)			0.380	K/W
R_{thJA}	Junction-to-Ambient		40		K/W

RATING AND CHARACTERISTICS CURVES(RI20N1200TT)

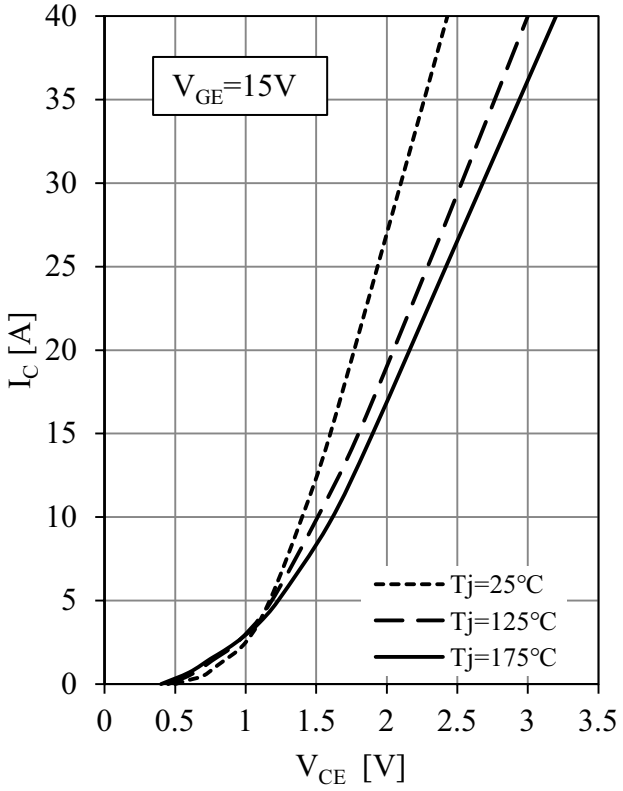


Fig 1. IGBT-inverter Output Characteristics

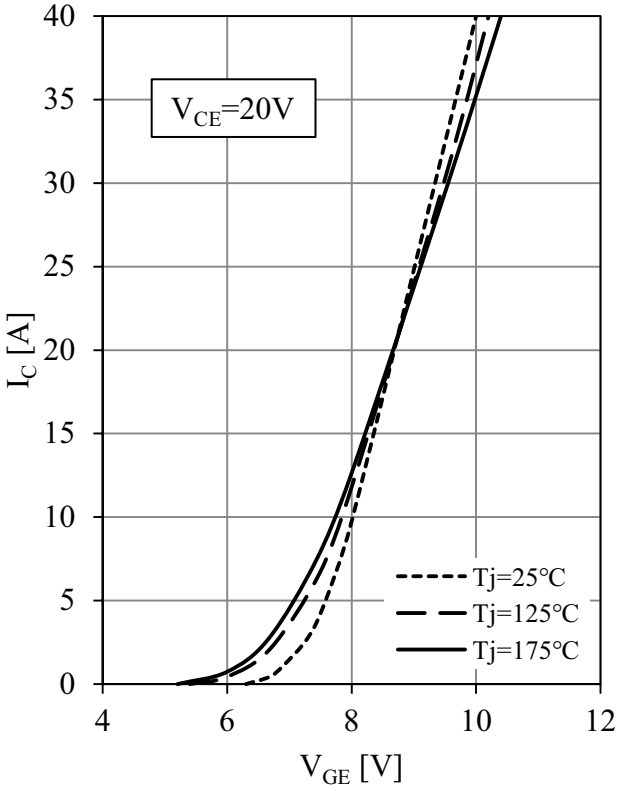


Fig 2. IGBT-inverter Transfer Characteristics

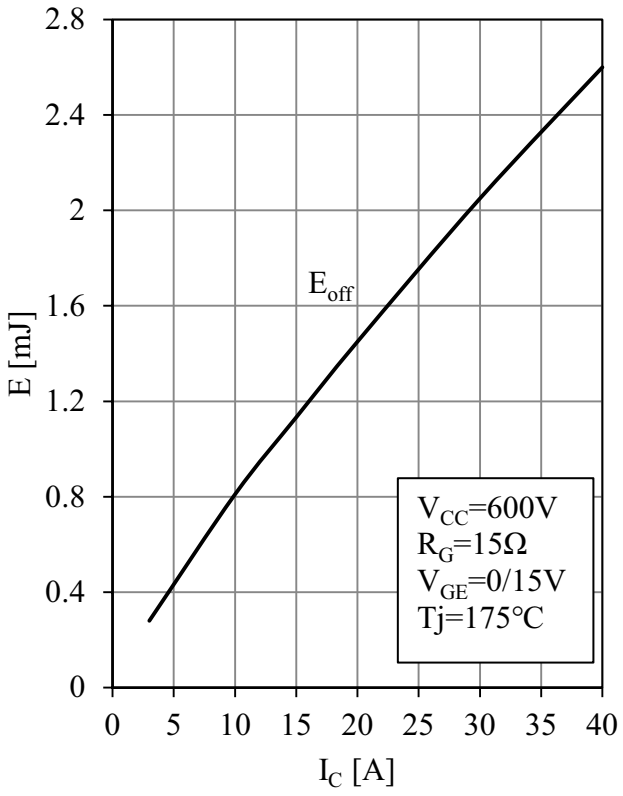


Fig 3. IGBT-inverter Switching Loss vs. I_C

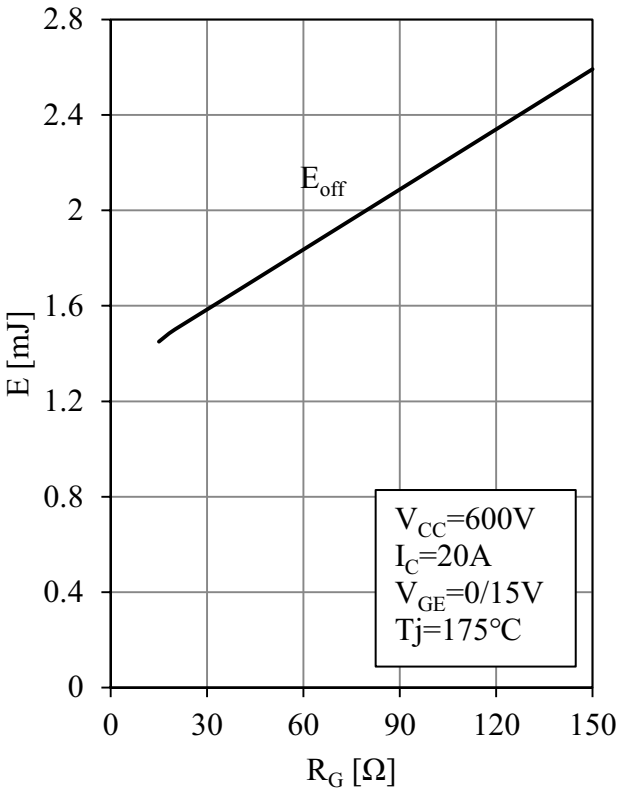


Fig 4. IGBT-inverter Switching Loss vs. R_G

RATING AND CHARACTERISTICS CURVES(RI20N1200TT)

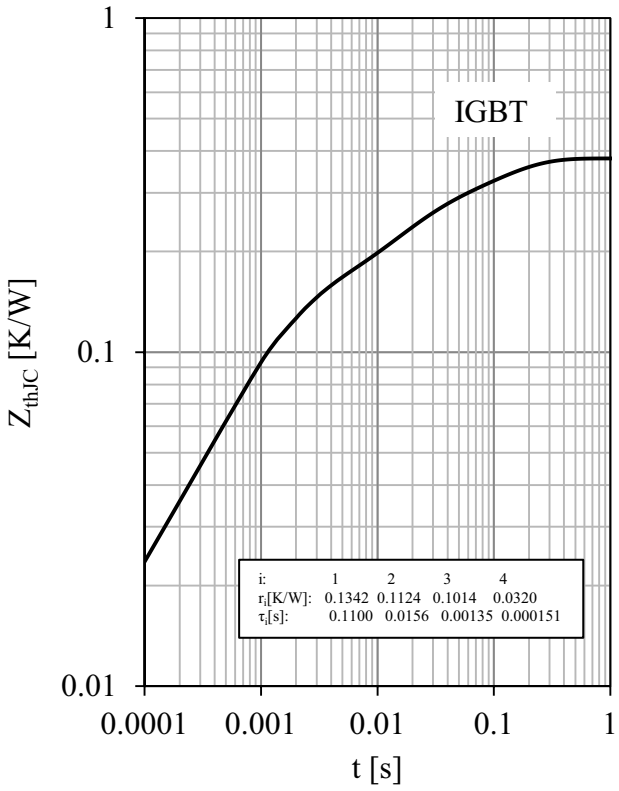


Fig 5. IGBT-inverter Transient Thermal Impedance

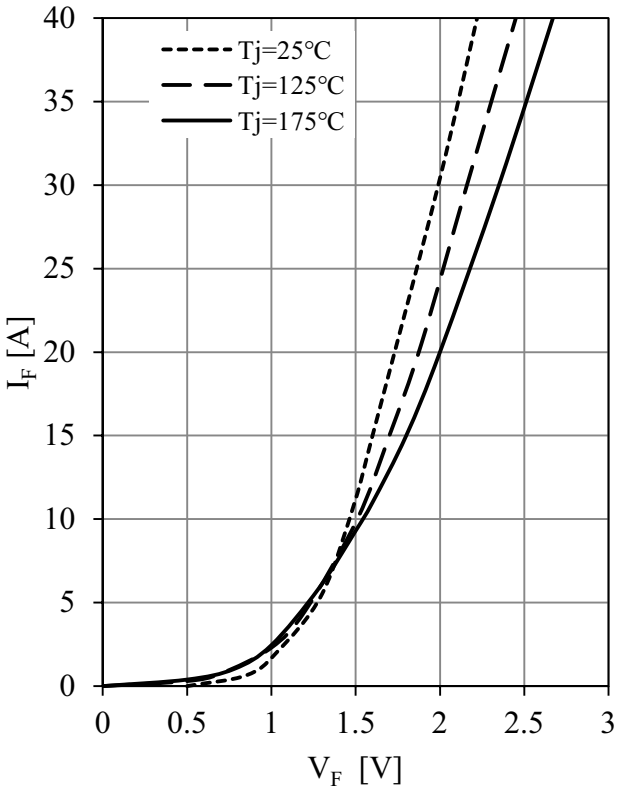


Fig 6. Diode-inverter Forward Characteristics

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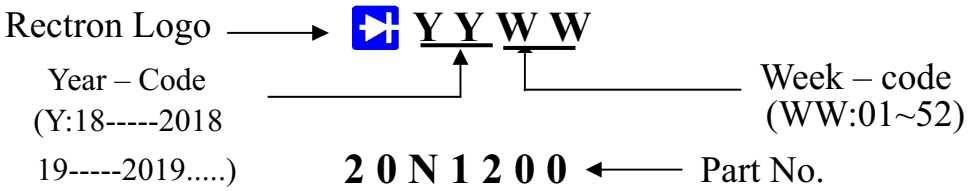
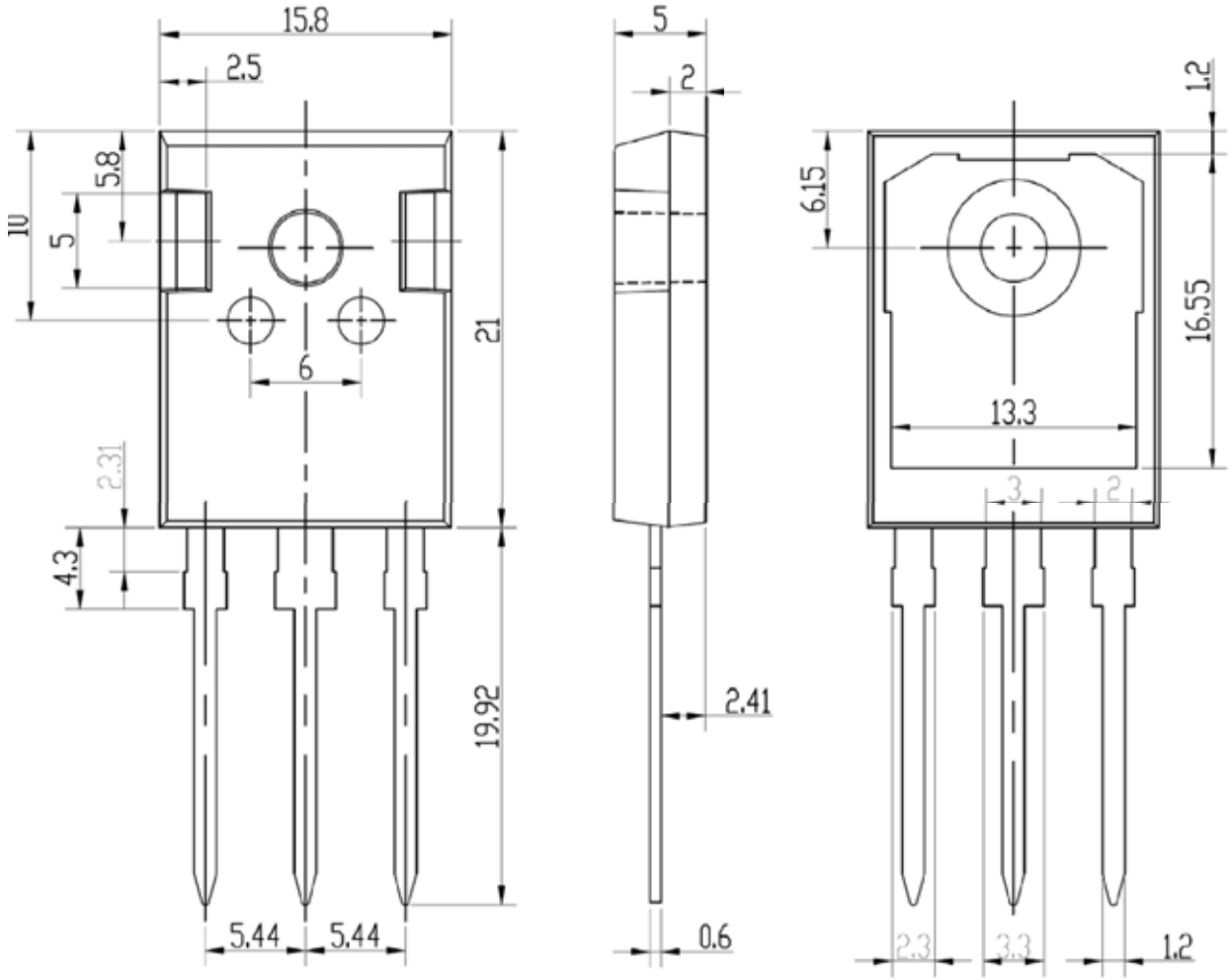
Marking on the body



Package Dimensions

Dimensions in Millimeters



Package	Tube (pcs/tube)	Tube (pcs/inner box)	Tube (pcs/cartoon)	Tape&Reel (pcs/reel)	Tape&Reel (pcs/inner box)	Tape&Reel (pcs/cartoon)
DFN5x6/DFN3x3	100	10,000	100,000	2,500	5,000	40,000
DFN1006	——	——	——	10,000	10,000	400,000
SOP-8	100	10,000	100,000	4,000	4,000	20,000
TSSOP-8	100	32,000	128,000	3,000	6,000	48,000
SOT-23-3L	——	——	——	3,000	30,000	120,000
SOT-23-6L	——	——	——	3,000	30,000	120,000
SOT-23(6R)	——	——	——	3,000	30,000	120,000
SOT-363	——	——	——	3,000	30,000	120,000
SOT-523	——	——	——	3,000	30,000	120,000
SOT223	——	——	——	2,500	2,500	20,000
TO-220	50	1,000	5,000	——	——	——
TO-220F	50	1,000	10,000	——	——	——
TO-247	30	300	1,200	——	——	——
TO-251	80	4,000	40,000	——	——	——
TO-251S(4R)	80	4,000	40,000	——	——	——
TO-252-2L(4R)	80	4,000	40,000	2,500	2,500	25,000
TO-263-2L	50	1,000	10,000	800	800	8,000
TO-3P	30	300	3,000	——	——	——
TO-92	——	——	——	1,000(袋装)	10,000	100,000

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