

STARPOWER

SEMICONDUCTOR™

Rectifier with Chopper

RD100PBH160C5S

Preliminary**Molding Type Module****1600V/100A Rectifier Module**

General Description

STARPOWER Rectifier Diode Power Module provides ultra low conduction loss. They are designed for the applications such as inverters.

Features

- Planar Passivated Chips
- High Surge Capacity
- Dual Diodes Cascaded Circuit
- Isolated Copper Baseplate Using DBC Technology



Typical Applications

- Input Bridge Rectifier For Inverter
- AC/DC Motor Control
- Power Supply

DIODE-rectifier $T_C=25^\circ\text{C}$ unless otherwise noted**Maximum Rated Values**

Symbol	Description	RD100PBH160C5S	Units
V_{RRM}	Collector-Emitter Voltage @ $T_j=25^\circ\text{C}$	1600	V
I_{FRMSM}	RMS Forward Current Maximum Per Diode @ $T_C=80^\circ\text{C}$	78	A
I_{RMSM}	Maximum RMS Current at Rectifier output @ $T_C=100^\circ\text{C}$	110	A
I_{FSM}	Surge Forward Current $V_R=0\text{V}$, $t_p=10\text{ms}$, $T_j=45^\circ\text{C}$ $T_j=150^\circ\text{C}$	1100 990	A
I^2t	I^2t -value, $V_R=0\text{V}$, $t_p=10\text{ms}$, $T_j=45^\circ\text{C}$ $T_j=150^\circ\text{C}$	6050 4725	A^2s

Characteristics Values

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
V_F	Diode Forward Voltage	$I_F=100\text{A}$, $T_j=25^\circ\text{C}$		1.19		V
I_R	Reverse Current	$T_j=150^\circ\text{C}$, $V_R=1600\text{V}$			2.0	mA

IGBT-brake-chopper $T_C=25^\circ\text{C}$ unless otherwise noted**Maximum Rated Values**

Symbol	Description	RD100PBH160C5S	Units
V_{CES}	Collector-Emitter Voltage @ $T_j=25^\circ\text{C}$	1200	V
V_{GES}	Gate-Emitter Voltage	± 20	V
I_C	Collector Current @ $T_C=80^\circ\text{C}$	50	A
I_{CM}	Pulsed Collector Current $t_p=1\text{ms}$	100	A
P_{tot}	Total Power Dissipation @ $T_j=150^\circ\text{C}$	412	W

Off Characteristics

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
$V_{(BR)CES}$	Collector-Emitter Breakdown Voltage	$T_j=25^\circ\text{C}$	1200			V
I_{CES}	Collector Cut-Off Current	$V_{CE}=V_{CES}$, $V_{GE}=0\text{V}$, $T_j=25^\circ\text{C}$			5.0	mA
I_{GES}	Gate-Emitter Leakage Current	$V_{GE}=V_{GES}$, $V_{CE}=0\text{V}$, $T_j=25^\circ\text{C}$			400	nA

On Characteristics

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
$V_{GE(th)}$	Gate-Emitter Threshold Voltage	$I_C=2.0mA, V_{CE}=V_{GE}, T_j=25^\circ C$	5.0	6.3	7.0	V
$V_{CE(sat)}$	Collector to Emitter Saturation Voltage	$I_C=50A, V_{GE}=15V, T_j=25^\circ C$		1.90	2.35	V
		$I_C=50A, V_{GE}=15V, T_j=125^\circ C$		2.10		
C_{ies}	Input Capacitance	$V_{CE}=25V, f=1Mhz, V_{GE}=0V$		4.29		pF
C_{oes}	Output Capacitance			0.30		pF
C_{res}	Reverse Transfer Capacitance			0.20		pF

DIODE-brake-chopper $T_C=25^\circ C$ unless otherwise noted

Maximum Rated Values

Symbol	Description	RD100PBH160C5S	Units
V_{RRM}	Collector-Emitter Voltage @ $T_j=25^\circ C$	1200	V
I_F	DC Forward Current @ $T_C=80^\circ C$	50	A
I_{FRM}	Repetitive Peak Forward Current $t_p=1ms$	100	A

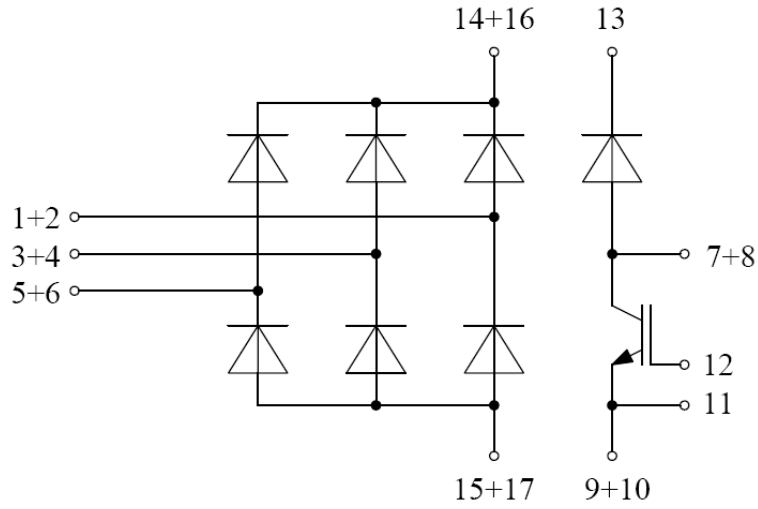
Characteristics Values

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units	
V_F	Diode Forward Voltage	$I_F=50A, V_{GE}=0V$	$T_j=25^\circ C$		1.82	2.22	V
			$T_j=125^\circ C$		1.95		
Q_r	Recovered Charge	$I_F=50A,$	$T_j=25^\circ C$		3.3		μC
			$T_j=125^\circ C$		6.5		
I_{RM}	Peak Reverse Recovery Current	$V_R=600V,$ $di/dt=-830A/\mu s,$	$T_j=25^\circ C$		34		A
			$T_j=125^\circ C$		47		
E_{rec}	Reverse Recovery Energy	$V_{GE}=-15V$	$T_j=25^\circ C$		0.76		mJ
			$T_j=125^\circ C$		1.81		

Module

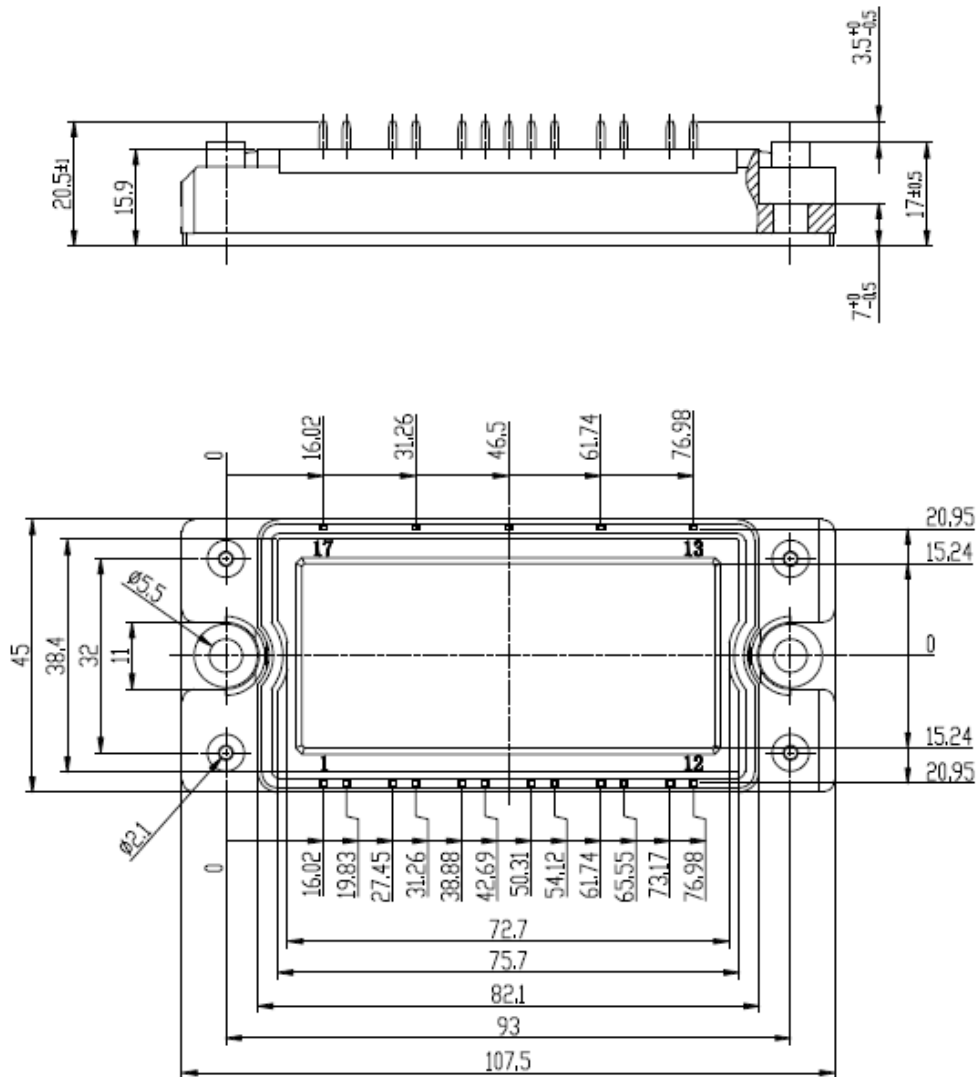
Symbol	Parameter	Min.	Typ.	Max.	Units
V _{ISO}	Isolation Voltage RMS,f=50Hz,t=1min	2500			V
R _{θJC}	Junction-to-Case (per DIODE-rectifier)			0.469	K/W
	Junction-to-Case (per IGBT-brake-chopper)			0.303	
	Junction-to-Case (per DIODE-brake-chopper)			0.500	
R _{θCS}	Case-to-Sink (Conductive grease applied)		0.02		K/W
T _j	Junction Temperature	-40		150	°C
T _{STG}	Storage Temperature Range	-40		125	°C
Mounting Torque	Mounting Screw:M5	3.0		6.0	N.m
G	Weight of Module		200		g

Equivalent Circuit Schematic



Package Dimension

Dimensions in Millimeters



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