STARPOWER

SEMICONDUCTOR **IGBT**

GD75HCU120C8S

Molding Type Module

1200V/75A 4 in one-package

General Description

STARPOWER IGBT Power Module provides ultrafast switching speed as well as short circuit ruggedness. It's designed for the applications such as electronic welder and inductive heating.

Features

- NPT IGBT technology
- 10μs short circuit capability
- Low switching losse
- $V_{CE(sat)}$ with positive temperature coefficient
- Square RBSOA
- Low inductance case
- Fast & soft reverse recovery anti-parallel FWD
- Isolated copper baseplate using DBC technology

Typical Applications

- Switching mode power supplies
- Inductive heating
- Electronic welder

IGBT-inverter T_C=25℃ unless otherwise noted

Maximum Rated Values

Symbol	Description	GD75HCU120C8S	Units
V_{CES}	Collector-Emitter Voltage @ T_j=25℃	1200	V
V_{GES}	Gate-Emitter Voltage @ T_j=25℃	±20	V
I_C	Collector Current @ T_C=25℃ @ T_C=80℃	110 75	A
I_{CM}	Pulsed Collector Current t_p=1ms	150	A
P_{tot}	Total Power Dissipation @ T_j=150℃	595	W

Off Characteristics

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

On Characteristics

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
$V_{GE(th)}$	Gate-Emitter Threshold Voltage	I_C=1.5mA,V_{CE}=V_{GE}, T_j=25℃	4.8	5.5	6.3	V
$V_{CE(sat)}$	Collector to Emitter Saturation Voltage	I_C=75A,V_{GE}=15V, T_j=25℃		2.90	3.35	V
		I_C=75A,V_{GE}=15V, T_j=125℃		3.60		

Switching Characteristics

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
$t_{d(on)}$	Turn-On Delay Time	V_{CC}=600V,I_C=75A, R_G=8.6Ω,V_{GE}=±15V, T_j=25℃		205		ns
t_r	Rise Time			49		ns
$t_{d(off)}$	Turn-Off Delay Time			262		ns
t_f	Fall Time			137		ns
E_{on}	Turn-On Switching Loss			6.30		mJ
E_{off}	Turn-Off Switching Loss			2.46		mJ
$t_{d(on)}$	Turn-On Delay Time	V_{CC}=600V,I_C=75A, R_G=8.6Ω,V_{GE}=±15V, T_j=125℃		205		ns
t_r	Rise Time			50		ns
$t_{d(off)}$	Turn-Off Delay Time			275		ns
t_f	Fall Time			170		ns
E_{on}	Turn-On Switching Loss			8.25		mJ
E_{off}	Turn-Off Switching Loss			3.62		mJ
C_{ies}	Input Capacitance	V_{CE}=25V,f=1MHz, V_{GE}=0V		5.18		nF
C_{oes}	Output Capacitance			0.78		nF
C_{res}	Reverse Transfer Capacitance			0.35		nF
I_{SC}	SC Data	t_P≤10μs,V_{GE}=15V, T_j=125℃,V_{CC}=900V, V_{CEM}≤1200V		660		A
Q_G	Gate Charge	V_{CC}=600V,I_C=75A, V_{GE}=-15…+15V		0.5		μC
R_{Gint}	Internal Gate Resistance			/		Ω

Diode-inverter T_C=25℃ unless otherwise noted

Maximum Rated Values

Symbol	Description	GD75HCU120C8S	Units
V_{RRM}	Repetitive Peak Reverse Voltage @ T_j=25℃	1200	V
I_F	DC Forward Current	30	A
I_{FRM}	Repetitive Peak Forward Current t_p=1ms	60	A

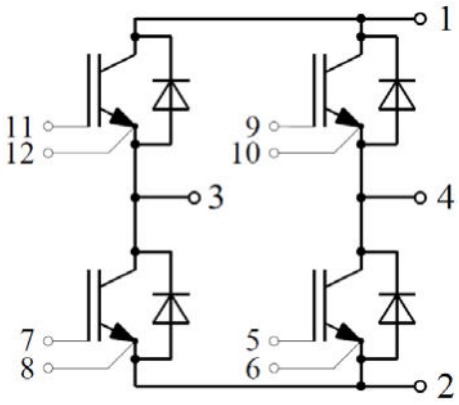
Characteristics Values

Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Units
V_F	Diode Forward Voltage	I_F=30A	T_j=25℃		1.90	2.30	V
			T_j=125℃		1.80		
Q_r	Recovered Charge	I_F=30A, V_R=600V, R_G=15Ω, V_{GE}=-15V	T_j=25℃		2.6		μC
			T_j=125℃		4.2		
I_{RM}	Peak Reverse Recovery Current		T_j=25℃		20		A
			T_j=125℃		23		
E_{rec}	Reverse Recovery Energy		T_j=25℃		1.31		mJ
			T_j=125℃		2.08		

IGBT Module

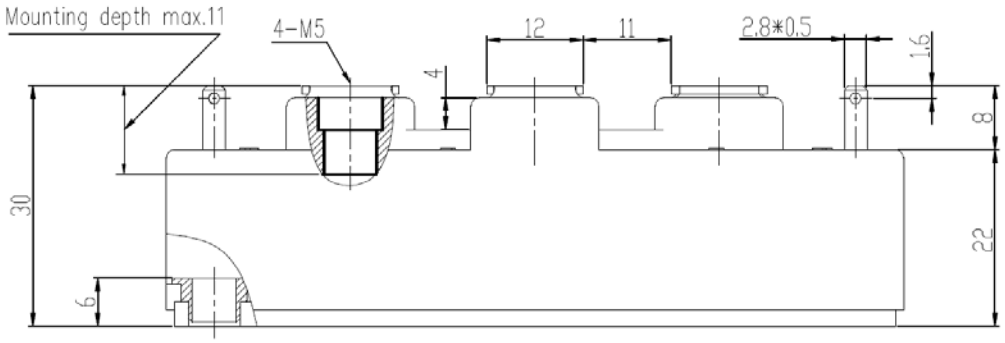
Symbol	Parameter	Min.	Typ.	Max.	Units
V_{ISO}	Isolation Voltage RMS,f=50Hz,t=1min	2500			V
$R_{\theta JC}$	Junction-to-Case (per IGBT-inverter) Junction-to-Case (per Diode-inverter)			0.210 0.927	K/W
$R_{\theta CS}$	Case-to-Sink (Conductive grease applied)		0.046		K/W
T_{jmax}	Maximum Junction Temperature			150	℃
T_{jop}	Operating Junction Temperature	-40		125	℃
T_{STG}	Storage Temperature Range	-40		125	℃
Mounting Torque	Power Terminal Screw:M5 Mounting Screw:M5	2.5 3.0		5.0 5.0	N.m
G	Weight of Module		300		g

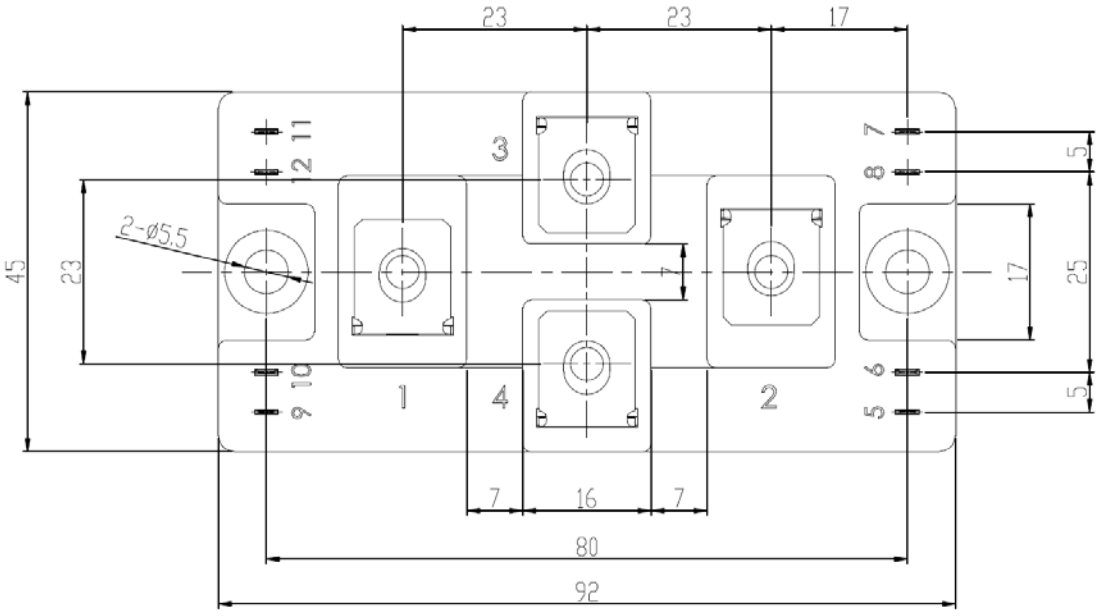
Equivalent Circuit Schematic



Package Dimensions

Dimensions in Millimeters





Terms and Conditions of Usage

The data contained in this product datasheet is exclusively intended for technically trained staff. you and your technical departments will have to evaluate the suitability of the product for the intended application and the completeness of the product data with respect to such application.

This product data sheet is describing the characteristics of this product for which a warranty is granted. Any such warranty is granted exclusively pursuant the terms and conditions of the supply agreement. There will be no guarantee of any kind for the product and its characteristics.

Should you require product information in excess of the data given in this product data sheet or which concerns the specific application of our product, please contact the sales office, which is responsible for you (see www.powersemi.cc), For those that are specifically interested we may provide application notes.

Due to technical requirements our product may contain dangerous substances. For information on the types in question please contact the sales office, which is responsible for you.

Should you intend to use the Product in aviation applications, in health or live endangering or life support applications, please notify.

If and to the extent necessary, please forward equivalent notices to your customers.
Changes of this product data sheet are reserved.