IVSM12160HA2Z – 1200V 160mΩ Gen2 Automotive SiC MODULE

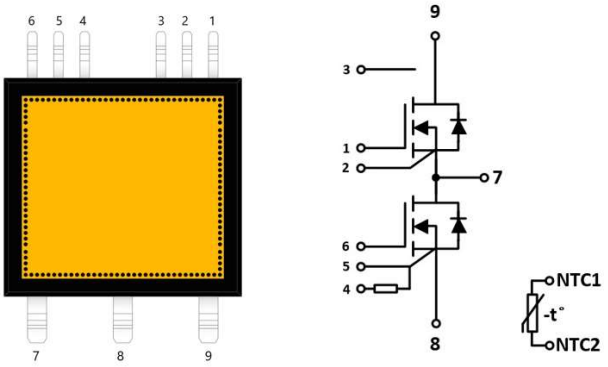
Features

- High blocking voltage with low on-resistance
- High speed switching with low capacitance
- High operating junction temperature capability
- Very fast and robust intrinsic body diode
- Kelvin gate input easing driver circuit design
- Integrated NTC temperature sensing

Applications

- Automotive OBC and DC/DC converters
- Automotive compressor inverters
- EV chargers
- Switch mode power supplies
- UPS and energy storage systems

Outline:



Absolute Maximum Ratings (Per leg/T_C=25°C unless otherwise specified)

Symbol	Parameter	Value	Unit	Test Conditions	Note
V_{DS}	Drain-Source voltage	1200	V	V_{GS}=0V, I_D=100μA	
V_{GSmax} (DC)	Maximum DC voltage	-5 to 20	V	Static (DC)	
V_{GSmax} (Spike)	Maximum spike voltage	-10 to 23	V	Duty cycle<1%, and pulse width<200ns	
V_{GSon}	Recommended turn-on voltage	18±0.5	V		
V_{GSoff}	Recommended turn-off voltage	-3.5 to -2	V		
I_D	Drain current (continuous)	19	A	V_{GS}=18V, T_C=25°C	
		14	A	V_{GS}=18V, T_C=100°C	
I_{DM}	Drain current (pulsed)	47	A	Pulse width limited by SOA	
P_{TOT}	Total power dissipation	136	W	T_C=25°C	
T_{stg}	Storage temperature range	-55 to 175	°C		
T_J	Operating junction temperature	-55 to 175	°C		

Note: Assumes $R_{\theta(J-C)}$<1.122°C/W.

Thermal Data

Symbol	Parameter	Value	Unit	Note
$R_{\theta(J-C)}$	Thermal Resistance from Junction to Case	TBD	°C/W	

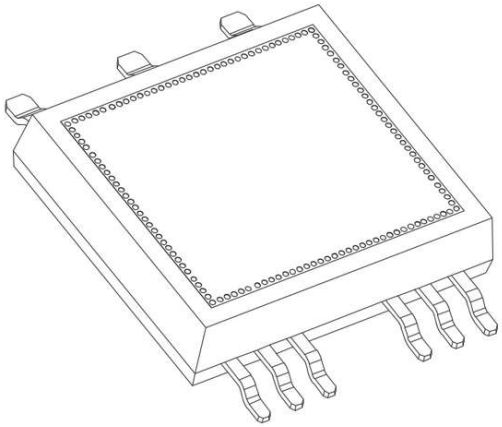
Electrical Characteristics (Per leg/T_C=25°C unless otherwise specified)

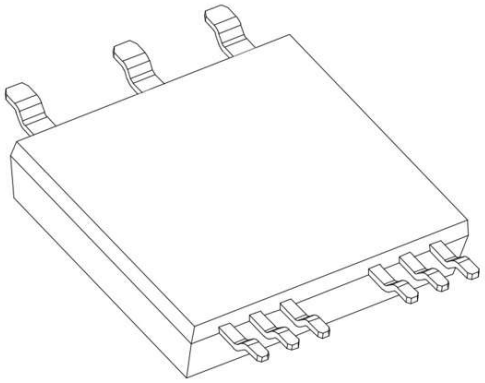
Symbol	Parameter	Value			Unit	Test Conditions	Note
		Min.	Typ.	Max.			
I_{DSS}	Zero gate voltage drain current		5	100	μA	V_{DS}=1200V, V_{GS}=0V	
I_{GSS}	Gate leakage current			±100	nA	V_{DS}=0V, V_{GS}=-5~20V	
V_{TH}	Gate threshold voltage	1.8	2.8	4.5	V	V_{GS}=V_{DS}, I_D=2mA	
			2.1			V_{GS}=V_{DS}, I_D=2mA @ T_J=175°C	
R_{ON}	Static drain-source on-resistance		160	208	mΩ	V_{GS}=18V, I_D=5A @T_J=25°C	
			285		mΩ	V_{GS}=18V, I_D=5A @T_J=175°C	
C_{iss}	Input capacitance		575		pF	V_{DS}=800V, V_{GS}=0V, f=1MHz, V_{AC}=25mV	
C_{oss}	Output capacitance		34		pF		
C_{rss}	Reverse transfer capacitance		2.3		pF		
E_{oss}	C_{oss} stored energy		14		μJ		
Q_g	Total gate charge		29		nC	V_{DS}=800V, I_D=10A, V_{GS}=-3 to 18V	
Q_{gs}	Gate-source charge		6.6		nC		
Q_{gd}	Gate-drain charge		14.4		nC		
R_g	Gate input resistance		10		Ω	f=1MHz	
E_{ON}	Turn-on switching energy				μJ	V_{DS}=800V, I_D=10A, V_{GS}=-3.5 to 18V, $R_{G(ext)}$=3.3Ω, L=300μH T_J=25°C	
E_{OFF}	Turn-off switching energy				μJ		
$t_{d(on)}$	Turn-on delay time				ns		
t_r	Rise time						
$t_{d(off)}$	Turn-off delay time						
t_f	Fall time						
E_{ON}	Turn-on switching energy				μJ	V_{DS}=800V, I_D=10A, V_{GS}=-3.5 to 18V, $R_{G(ext)}$=3.3Ω,L=300μH T_J=175°C	
E_{OFF}	Turn-off switching energy				μJ		

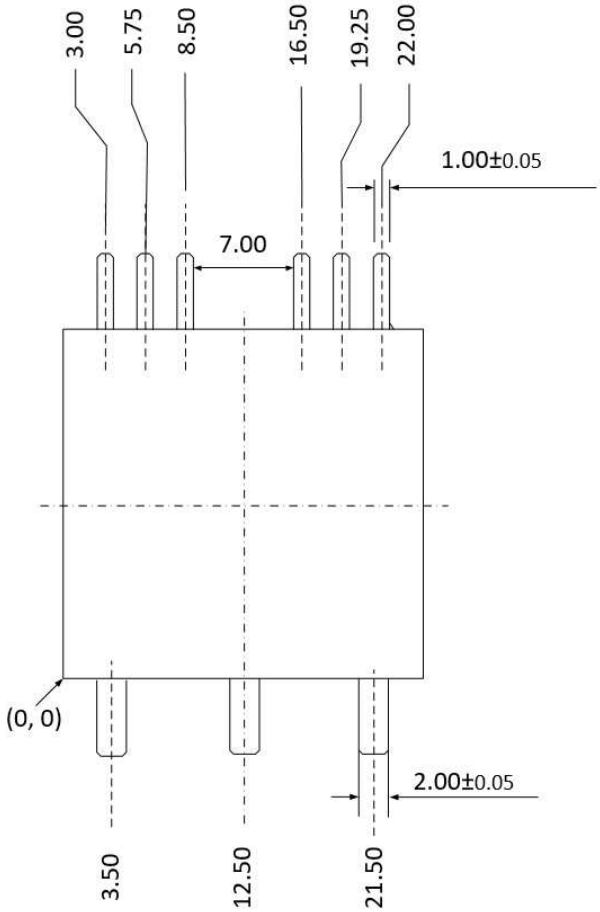
Reverse Diode Characteristics (T_C=25°C unless otherwise specified)

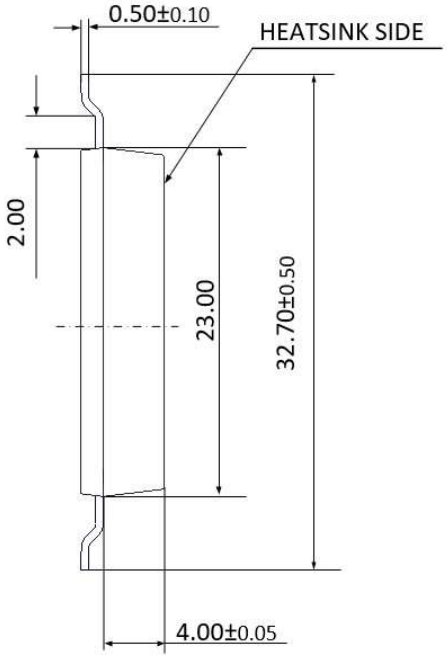
Symbol	Parameter	Value			Unit	Test Conditions	Note
		Min.	Typ.	Max.			
V_{SD}	Diode forward voltage		4.0		V	I_{SD}=5A, V_{GS}=0V	
			3.7		V	I_{SD}=5A, V_{GS}=0V, T_J=175°C	
t_{rr}	Reverse recovery time		26		ns	V_{GS}=-3.5V/+18V, I_{SD}=10A, V_R=800V, $R_{G(ext)}$=15Ω L=300μH di/dt=3000A/μs	
Q_{rr}	Reverse recovery charge		92		nC		
I_{RRM}	Peak reverse recovery current		10.6		A		

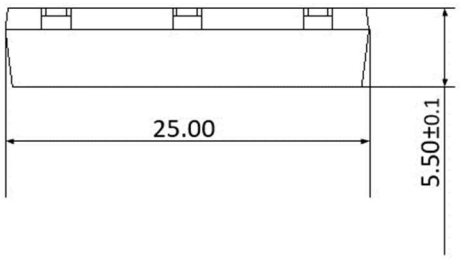
Package Dimensions





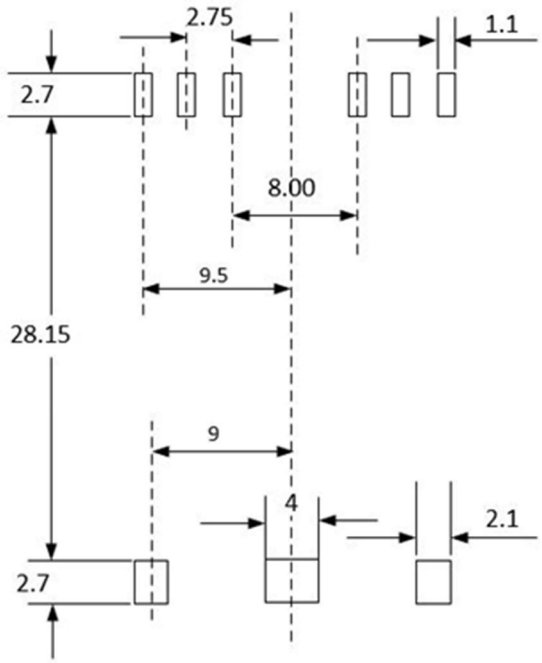






NOTE
1.General Tolerence ±0.2，±0.5°
2.General C0.2×45° R0.5
3.Module Flatness Spec：0 ~100um

Recommended footprint



NOTE:
8pin pad is enlarged to accommodate different packages.

Notes

For further information please contact IVCT's office.

The Information in this document is subject to change without notice.

Related Links

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