

LEGM35TD70E1HZ

IGBT Power Module

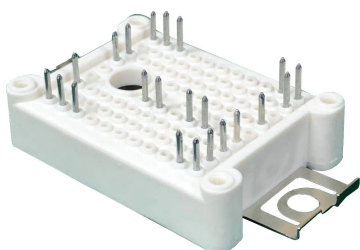
Features:

- $V_{CE}=700V$ $I_C=35A$
- Low $V_{CE(sat)}$
- V_{CEsat} with positive temperature coefficient
- Maximum junction temperature $175^{\circ}C$
- Isolation Type Package

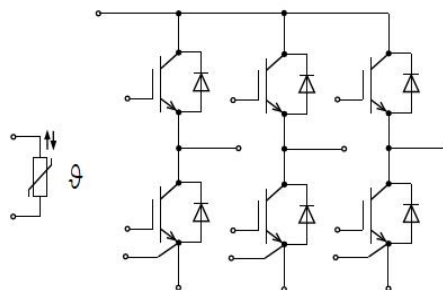
Applications:

- Air Conditioning
- Motor Drives
- Servo Drives
- UPS Systems

Package Type & Internal Circuit



E1



Internal Circuit

Maximum Rated Values (IGBT Inverter)

Symbol	Parameter	Conditions	Ratings	Unit
V_{CES}	Collector-emitter voltage	$V_{EC}=0V, I_C=1mA, T_{vj}=25^{\circ}C$	700	V
I_C	Continuous Collector Current	$T_C=100^{\circ}C$	35	A
I_{CRM}	Peak Collector Current	$I_{CRM}=2I_C$	70	A
V_{GES}	Gate-Emitter Voltage	$T_{vj}=25^{\circ}C$	± 20	V
P_{tot}	Total Power Dissipation	$T_C=25^{\circ}C, T_{vjmax}=175^{\circ}C$	75	W

Characteristics Values (IGBT Inverter)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$I_C=35A, V_{GE}=15V, T_{vj}=25^{\circ}C$		1.38	1.52	V
		$I_C=35A, V_{GE}=15V, T_{vj}=150^{\circ}C$		1.50		V
$V_{GE(th)}$	Gate Threshold Voltage	$I_C=1.0mA, V_{CE}=V_{GE}, T_{vj}=25^{\circ}C$	4.00	4.96	6.00	V
I_{CES}	Collector-Emitter Cut-off Current	$V_{CE}=700V, V_{GE}=0V, T_{vj}=25^{\circ}C$			1	mA
I_{GES}	Gate-Emitter Leakage Current	$V_{CE}=0V, V_{GE}=15V, T_{vj}=25^{\circ}C$			100	nA
C_{ies}	Input capacitance	$V_{CE}=30V, V_{GE}=0V$ $f=1MHz$		2480		pF
C_{res}	Reverse transfer capacitance			21		pF
$t_{d(on)}$	Turn-on Delay Time, Inductive Load	$I_C=35A, V_{CE}=300V$ $V_{GE}=\pm 15V$ $R_G=20\Omega$ $T_{vj}=25^{\circ}C$		33		ns
t_r	Rise Time, Inductive Load			26		ns
$t_{d(off)}$	Turn-off Delay Time, Inductive Load			141		ns
t_f	Fall Time, Inductive Load			165		ns
E_{on}	Turn-on Energy Loss per Pulse			0.52		mJ
E_{off}	Energy Loss per Pulse			0.95		mJ
$t_{d(on)}$	Turn-on Delay Time, Inductive Load	$I_C=35A, V_{CE}=300V$ $V_{GE}=\pm 15V$ $R_G=20\Omega$ $T_{vj}=150^{\circ}C$		31		ns
t_r	Rise Time, Inductive Load			37		ns
$t_{d(off)}$	Turn-off Delay Time, Inductive Load			160		ns
t_f	Fall Time, Inductive Load			253		ns
E_{on}	Turn-on Energy Loss per Pulse			0.71		mJ
E_{off}	Energy Loss per Pulse			1.36		mJ
R_{thJC}	Thermal resistance, junction to case	per IGBT		2.01		K/W
$T_{vj op}$	Temperature under switching conditions		-40		150	$^{\circ}C$

Maximum Rated Values (Diode Inverter)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
V_{RRM}	Repetitive Peak Reverse Voltage	$T_{vj}=25\text{ }^{\circ}\text{C}$		700		V
I_F	Continuous DC Forward Current	$T_C=100\text{ }^{\circ}\text{C}$		35		A
I_{FRM}	Repetitive Peak Forward Current	$t_p=1\text{ ms}$		70		A

Characteristic Values (Diode Inverter)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
V_F	Forward Voltage	$I_F=35\text{ A}, V_{CE}=0\text{ V}, T_{vj}=25\text{ }^{\circ}\text{C}$		1.53		V
		$I_F=35\text{ A}, V_{CE}=0\text{ V}, T_{vj}=150\text{ }^{\circ}\text{C}$		1.27		V
I_{rr}	Reverse Recovery time	$I_F=35\text{ A}, V_R=300\text{ V}$ -di/dt=745 A/us $T_{vj}=25\text{ }^{\circ}\text{C}$		34		A
Q_r	Recovered Charge			64		uC
E_{rec}	Reverse Recovery Energy			0.15		mJ
I_{rr}	Reverse Recovery time	$I_F=35\text{ A}, V_R=300\text{ V}$ -di/dt=745 A/us $T_{vj}=150\text{ }^{\circ}\text{C}$		56		A
Q_r	Recovered Charge			121		uC
E_{rec}	Reverse Recovery Energy			0.72		mJ
R_{thJC}	Thermal resistance, junction to case	per Diode		1.38		K/W
$T_{vj\text{ op}}$	Temperature under switching conditions		-40		150	$^{\circ}\text{C}$

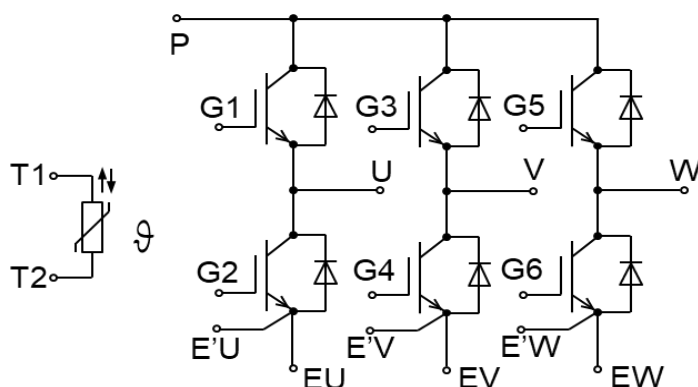
NTC-Thermistor (Characteristic Values)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
R_{25}	Rated resistance	$T_c=25\text{ }^{\circ}\text{C}$		5		K Ω
$\Delta R/R$	Deviation of R100	$T_c=100\text{ }^{\circ}\text{C}$	-5		5	%
P_{25}	Power dissipation	$T_c=25\text{ }^{\circ}\text{C}$		20		mW
$B_{25/50}$	B-value	$R_2=R_{25}\exp[B_{25/50}(1/T_2-1/(298,15K))]$		3380		K
$B_{25/100}$	B-value	$R_2=R_{25}\exp[B_{25/100}(1/T_2-1/(298,15K))]$		3450		K

Module Characteristics

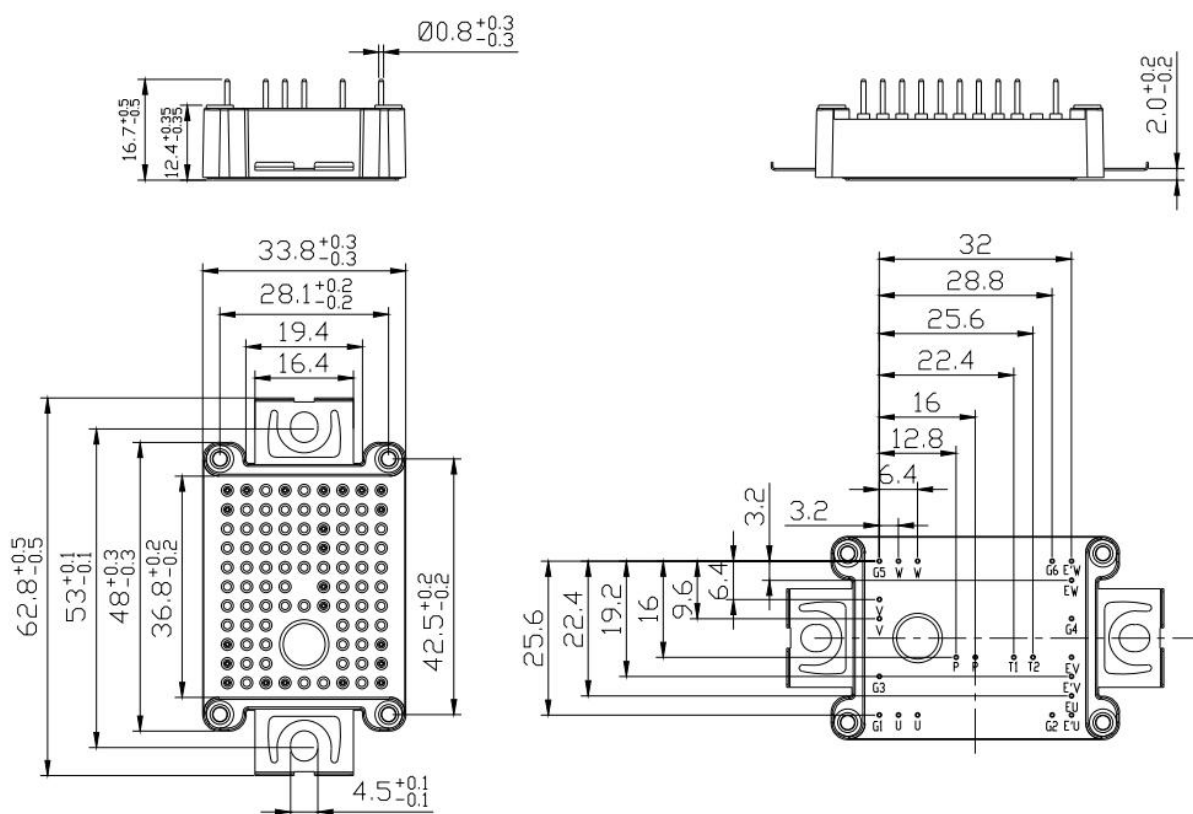
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
V_{isol}	Isolation voltage	$t=10\text{s}, f=50\text{Hz}$	3500			V
T_{stg}	Storage Temperature		-40		125	$^{\circ}\text{C}$
F	Mounting force per clamp		20		50	N
G	Weight of Module			25		g

Circuit Diagram



Package Dimensions

(Dimensions in Millimeters)



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2. Operating conditions may differ from simulation assumptions in several aspects like level of DC-link voltage, applied gate-voltage and gate-resistor, case and junction temperatures as well as the power circuit stray-inductance. Therefore, deviations of parameters and assumptions used for the simulation and the real application may exist.
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