LEGM25TF120E1H7

IGBT Power Module

Features:

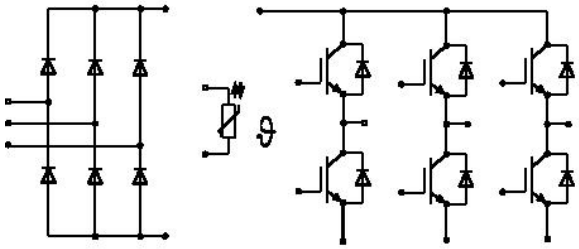
- V_{CE}=1200V I_C=25A
- Low $V_{CE(sat)}$
- TRENCHSTOP™ IGBT7
- V_{CEsat} with positive temperature coefficient
- Overload operation up to 175℃
- Isolation Type Package

Applications:

- The inverter
- Motor control and drives

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℃	1200	V
I_C	Continuous Collector Current	T_C=100℃	25	A
I_{CRM}	Peak Collector Current	I_{CRM}=2I_C	50	A
V_{GES}	Gate-Emitter Voltage	T_{vj}=25℃	±20	V

Maximum Rated Values (IGBT Inverter)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	I_C=25 A, V_{GE}=15 V, T_{vj}=25 ℃		1.85		V
		I_C=25 A, V_{GE}=15 V, T_{vj}=175 ℃		2.30		V
$V_{GE(th)}$	Gate Threshold Voltage	I_C=0.8 mA,V_{CE}=V_{GE},T_{vj}= 25 ℃	5.0	5.67	6.5	V
C_{ies}	Input capacitance	f = 1 MHz, T_{vj}= 25°C, V_{CE} = 25 V, V_{GE}= 0 V		4.77		nF
C_{res}	Reverse transfer capacitance			0.017		nF
I_{CES}	Collector-Emitter Cut-off Current	V_{CE}=1200 V, V_{GE}=0 V, T_{vj}=25 ℃			1	mA
I_{GES}	Gate-Emitter Leakage Current	V_{CE}=0 V, V_{GE}=15 V, T_{vj}=25 ℃			100	nA
$t_{d(on)}$	Turn-on Delay Time, Inductive Load	I_C=25 A,V_{CE}=600 V V_{GE}=±15 V R_G=6.2Ω T_{vj}=25 ℃		0.037		µs
t_r	Rise Time, Inductive Load			0.02		µs
$t_{d(off)}$	Turn-off Delay Time, Inductive Load			0.186		µs
t_f	Fall Time, Inductive Load			0.173		µs
E_{on}	Turn-on Energy Loss per Pulse			1.55		mJ
E_{off}	Turn-off Energy Loss per Pulse			1.58		mJ
$t_{d(on)}$	Turn-on Delay Time, Inductive Load	I_C=25 A,V_{CE}=600 V V_{GE}=±15 V R_G=6.2Ω T_{vj}=175 ℃		0.04		µs
t_r	Rise Time, Inductive Load			0.025		µs
$t_{d(off)}$	Turn-off Delay Time, Inductive Load			0.334		µs
t_f	Fall Time, Inductive Load			0.285		µs
E_{on}	Turn-on Energy Loss per Pulse			2.45		mJ
E_{off}	Turn-off Energy Loss per Pulse			3.05		mJ
R_{thJH}	Junction-radiator thermal resistance	per IGBT		1.36		K/W
$T_{vj\ op}$	Temperature under switching conditions		-40		175	°C

Maximum Rated Values (Diode Inverter)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
V_{RRM}	Repetitive Peak Reverse Voltage	T_{vj}= 25 ℃		1200		V
I_F	Continuous DC Forward Current			25		A
I_{FRM}	Repetitive Peak Forward Current	t_P=1 ms		50		A

Characteristic Values (Diode Inverter)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
V_F	Forward Voltage	I_F=25 A, V_{CE}=0 V,T_{vj}= 25 ℃		2.03		V
		I_F=25 A, V_{CE}=0 V,T_{vj}= 175 ℃		1.61		V
I_{rr}	Peak reverse recovery current	I_F=25 A,V_R=600 V -di/dt=950A/us T_{vj}=25 ℃		24.2		A
Q_r	Recovered Charge			2.25		uC
E_{rec}	Reverse Recovery Energy			0.65		mJ
I_{rr}	Peak reverse recovery current	I_F=25A,V_R=600 V -di/dt=950A/us T_{vj}=175 ℃		37.6		A
Q_r	Recovered Charge			4.95		uC
E_{rec}	Reverse Recovery Energy			1.89		mJ
R_{thJH}	Junction-radiator thermal resistance	per Diode		1.96		K/W
$T_{vj\ op}$	Temperature under switching conditions		-40		175	℃

Maximum Rated Values (Diode Rectifier)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
V_{RRM}	Repetitive peak reverse voltage	T_{vj}=25 ℃		1600		V
I_{FRMSM}	Maximum RMS forward current per chip	T_c=100 ℃		25		A
I_{RMSM}	Maximum RMS current at rectifier chip	T_c=100 ℃		25		A
I_{FSM}	Surge forward current	t_p=10ms T_{vj}=25 ℃		300		A
I^2t	I²t-value			450		A^2S
I_{FSM}	Surge forward current	t_p=10ms T_{vj}=150 ℃		245		A
I^2t	I²t-value			300		A^2S

Characteristic Values (Diode Rectifier)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
V_F	Forward voltage	T_{vj}=150 ℃ I_F=10A		0.8		V
I_R	Reverse current	T_{vj}=150 ℃ V_R=1600V		1.0		mA
R_{thJH}	Junction-radiator thermal resistance	per diode		1.5		K/W
T_{vjop}	Temperature under switching conditions		-40		150	℃

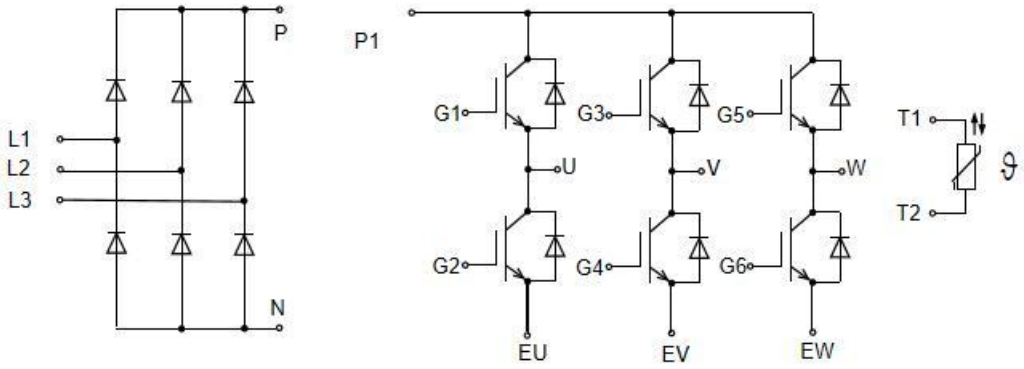
NTC-Thermistor (Characteristic Values)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
R_{25}	Rated resistance	T_c=25 ℃		5		KΩ
ΔR/R	Deviation of R100	T_c=100 ℃	-5		5	%
P_{25}	Power dissipation	T_c=25 ℃		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

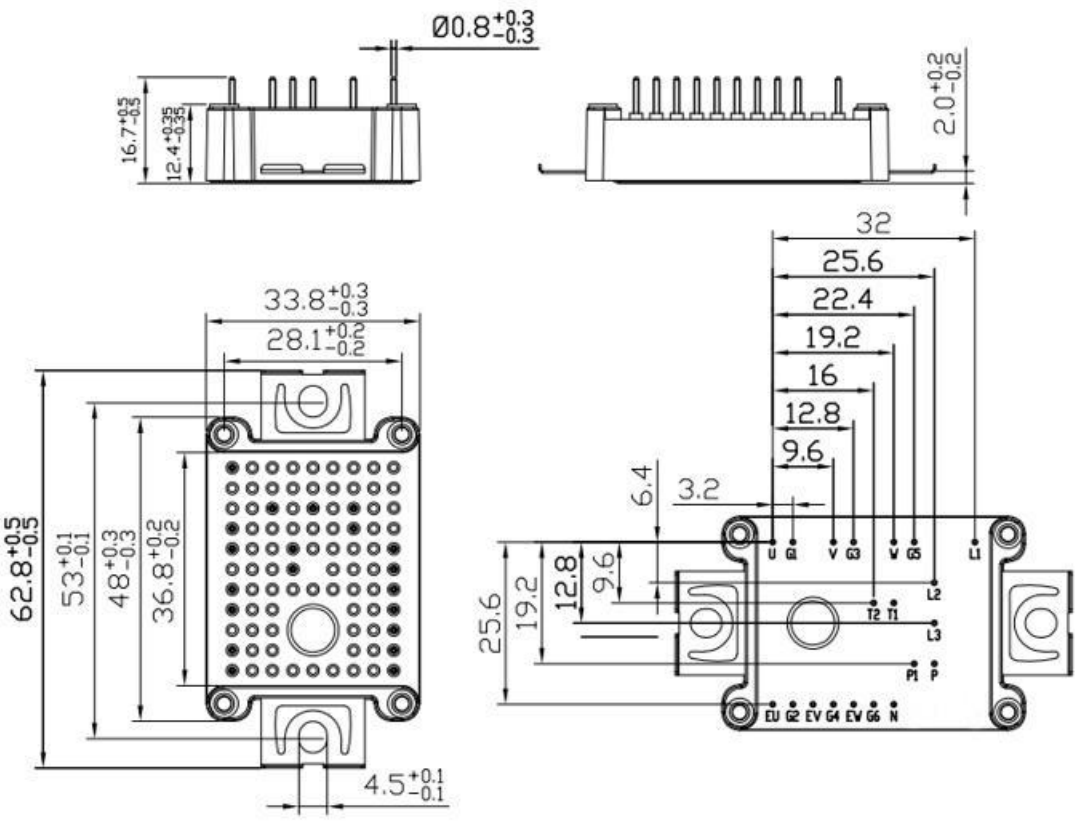
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
V_{isol}	Isolation voltage	t=1min,f=50Hz	2500			V
T_{stg}	Storage Temperature		-40		125	℃
F	Mountig Force per Clamp		20		50	N
G	Weight of Module			25		g

Circuit Diagram



Package Dimensions

(Dimensions in Millimeters)



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