LEGM75TD120E2H

IGBT Power Module

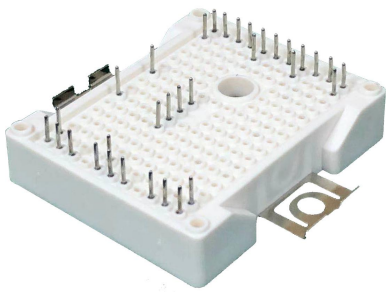
Features:

- V_{CE}=1200V I_C=75A
- Low $V_{CE(sat)}$
- V_{CEsat} with positive temperature coefficient
- Maximum junction temperature 150℃
- Isolation Type Package

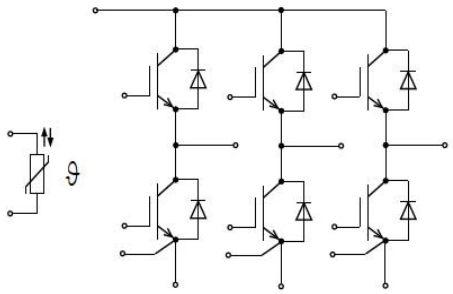
Applications:

- The inverter
- Motor control and drives

Package Type & Internal Circuit



E2



Internal Circuit

Maximum Rated Values (IGBT Inverter)

Symbol	Parameter	Conditions	Ratings	Unit
V_{CES}	Collector-emitter voltage	V_{EC}=0 V,I_C=1mA,T_{vj}=25℃	1200	V
I_C	Continuous Collector Current	T_C=100℃	75	A
I_{CRM}	Peak Collector Current	I_{CRM}=2I_C	150	A
V_{GES}	Gate-Emitter Voltage	T_{vj}=25℃	±30	V
P_{tot}	Total Power Dissipation	T_C=25℃,T_{vjmax}=150℃	350	W

Characteristics Values (IGBT Inverter)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	I_C=75 A, V_{GE}=15 V, T_{vj}=25 ℃		1.65		V
		I_C=75 A, V_{GE}=15 V, T_{vj}=125 ℃		1.80		V
$V_{GE(th)}$	Gate Threshold Voltage	I_C=5.0 mA,V_{CE}=V_{GE},T_{vj}= 25 ℃		5.8		V
I_{CES}	Collector-Emitter Cut-off Current	V_{CE}=1200 V, V_{GE}=0 V, T_{vj}=25 ℃			1.2	mA
I_{GES}	Gate-Emitter Leakage Current	V_{CE}=0 V, V_{GE}=15 V, T_{vj}=25 ℃			410	nA
$t_{d(on)}$	Turn-on Delay Time, Inductive Load	I_C= 75 A,V_{CE}= 600 V V_{GE} =±15 V R_{Gon} = 2 Ω T_{vj} = 25 ℃		110		ns
t_r	Rise Time, Inductive Load			35		ns
$t_{d(off)}$	Turn-off Delay Time, Inductive Load			270		ns
t_f	Fall Time, Inductive Load			170		ns
E_{on}	Turn-on Energy Loss per Pulse			1.9		mJ
E_{off}	Energy Loss per Pulse			4.8		mJ
$t_{d(on)}$	Turn-on Delay Time, Inductive Load	I_C = 75 A,V_{CE} = 600 V V_{GE} = ±15 V R_{Gon} = 2 Ω T_{vj}= 125 ℃		110		ns
t_r	Rise Time, Inductive Load			40		ns
$t_{d(off)}$	Turn-off Delay Time, Inductive Load			320		ns
t_f	Fall Time, Inductive Load			280		ns
E_{on}	Turn-on Energy Loss per Pulse			2.4		mJ
E_{off}	Energy Loss per Pulse			7.5		mJ
R_{thJC}	Thermal resistance, junction to case	per IGBT			0.35	K/W
$T_{vj\ op}$	Temperature under switching conditions		-40		125	℃
I_{SC}	SC data	V_{GE} ≤15 V, V_{CC} = 600 V V_{CEmax} = V_{CES} -L_{sCE} ·di/dt t_P ≤ 10 μs, T_{vj} = 125 ℃		400		A

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	T_C=100 ℃		75		A
I_{FRM}	Repetitive Peak Forward Current	t_P=1 ms		150		A
I^2t	I^2t Value	V_R=0 V, t_P=10 ms, T_{vj}=125 ℃		1200		A^2s

Characteristic Values (Diode Inverter)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
V_F	Forward Voltage	I_F=75 A, V_{CE}=0 V, T_{vj}=25 ℃		1.65		V
		I_F=75 A, V_{CE}=0 V, T_{vj}=125 ℃		1.75		V
t_{rr}	Reverse Recovery time	I_F= 75 A,V_R= 600 V -di/dt = 2000A/us T_{vj} = 25 ℃		100		ns
Q_r	Recovered Charge			15.6		uC
E_{rec}	Reverse Recovery Energy			0.5		mJ
t_{rr}	Reverse Recovery time	I_F= 75A,V_R= 600 V -di/dt = 2000A/us T_{vj} = 125 ℃		120		ns
Q_r	Recovered Charge			23.4		uC
E_{rec}	Reverse Recovery Energy			1.3		mJ
R_{thJC}	Thermal resistance, junction to case	per Diode			0.65	K/W
$T_{vj\ op}$	Temperature under switching conditions		-40		125	℃

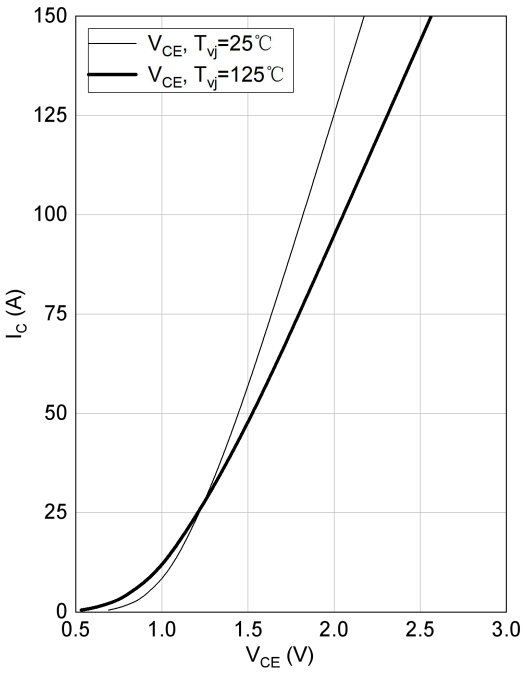
NTC-Thermistor (Characteristic Values)

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

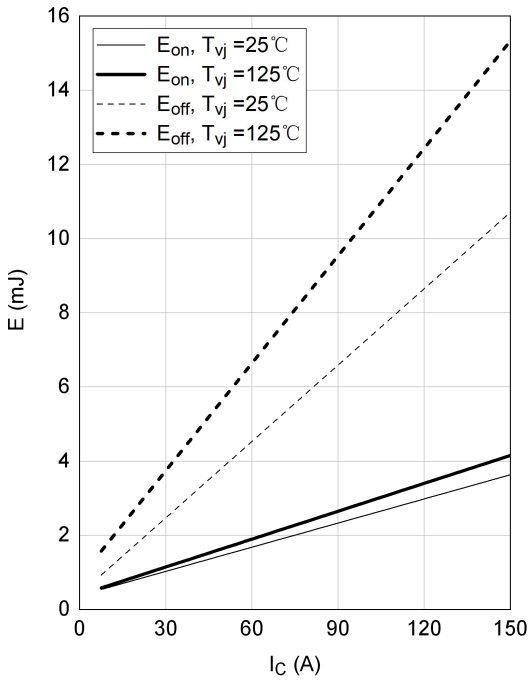
Module Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
V_{isol}	Isolation voltage	t=1min,f=50Hz	2500			V
T_{stg}	Storage Temperature		-40		150	℃
F	Mountig Force per Clamp		40		80	N
G	Weight of Module			40		g

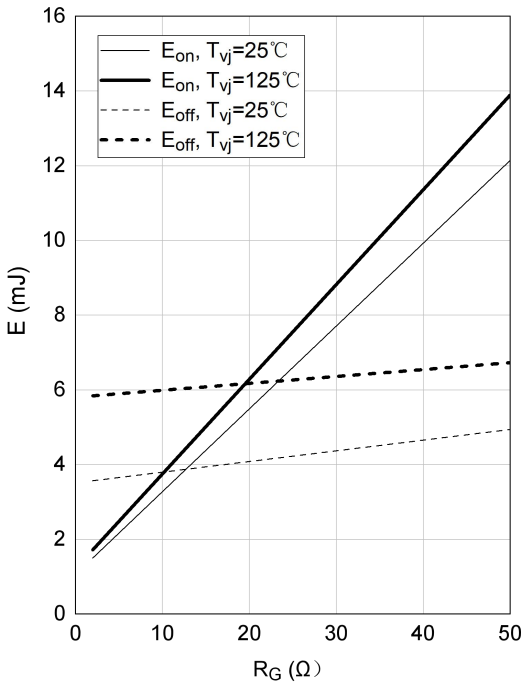
Output characteristic of IGBT,Inverter(typical)
$I_C = f(V_{CE})$
V_{GE} = 15V



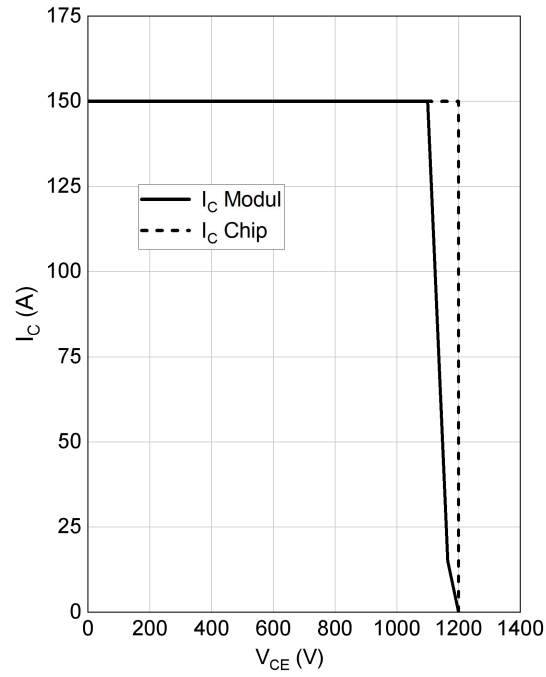
Switching losses IGBT,Inverter(typical)
$E_{on} = f(I_C)$, $E_{off} = f(I_C)$
V_{GE}= ±15V, R_{Gon} = 2Ω, R_{Goff} = 2Ω, V_{CE} = 600V



Switching losses IGBT,Inverter(typical)
$E_{on} = f(R_G)$, $E_{off} = f(R_G)$
V_{GE} = ±15V, I_C = 75A , V_{CE} = 600V

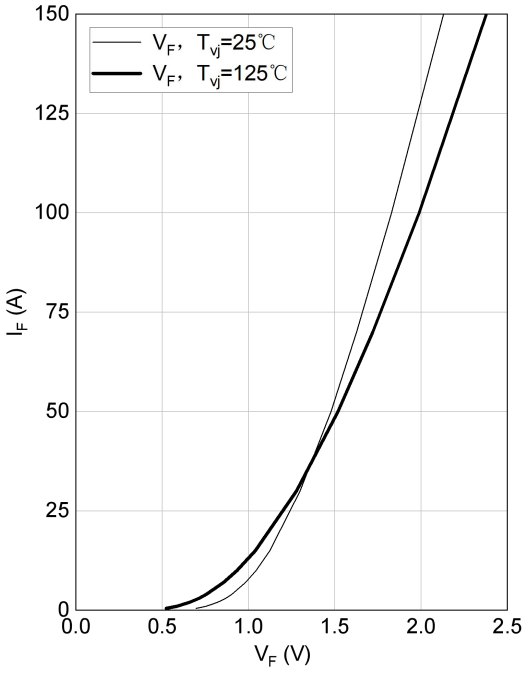


RBSOA IGBT,Inverter (typical)
$I_C = f(V_{CE})$
V_{GE} = ±15V, R_{Goff} = 50Ω, T_{vj} =125 ℃



Forward characteristic of Diode, Inverter (typical)

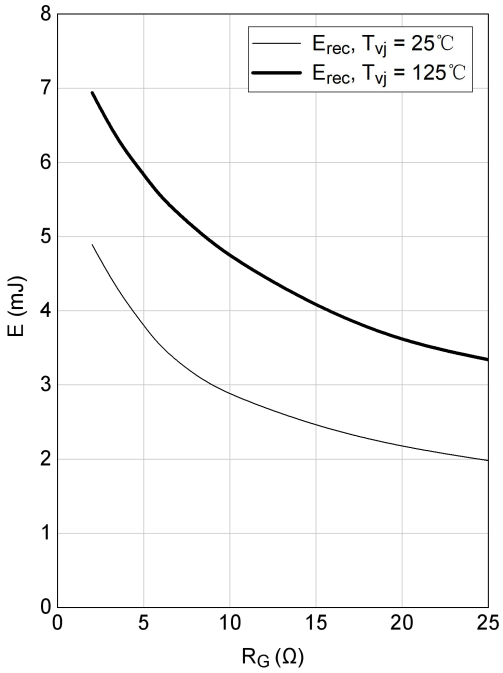
$I_F = f(V_F)$



Switching losses Diode, Inverter (typical)

$E_{rec} = f(R_G)$

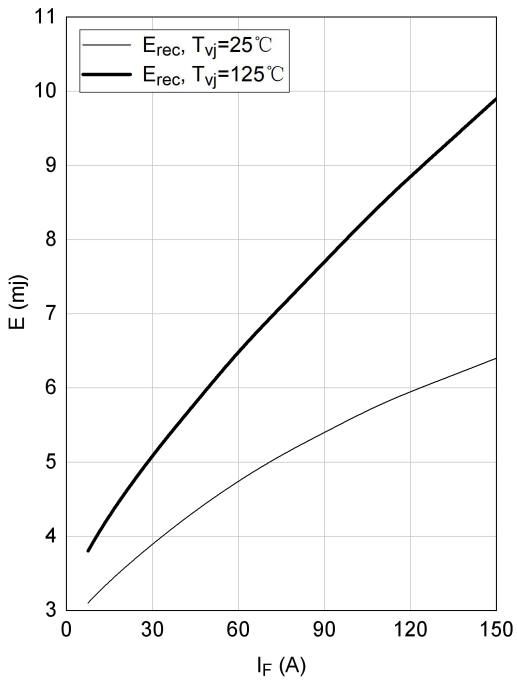
I_F = 75 A, V_{CE} = 600 V



Switching losses Diode, Inverter (typical)

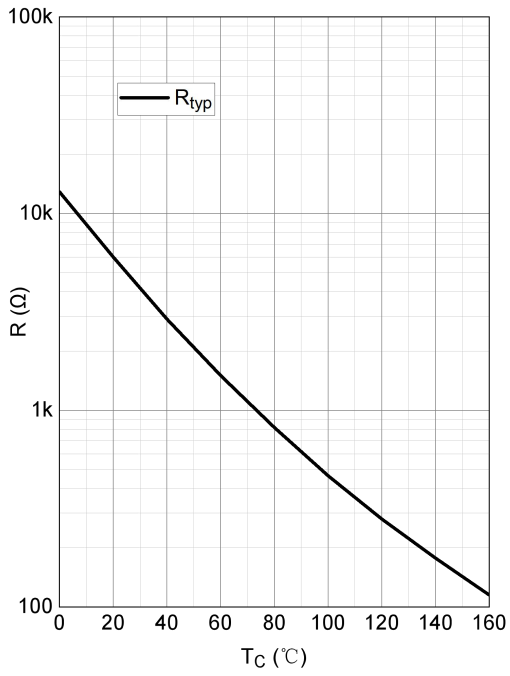
$E_{rec} = f(I_F)$

R_{Gon} = 2Ω, V_{CE} = 600 V

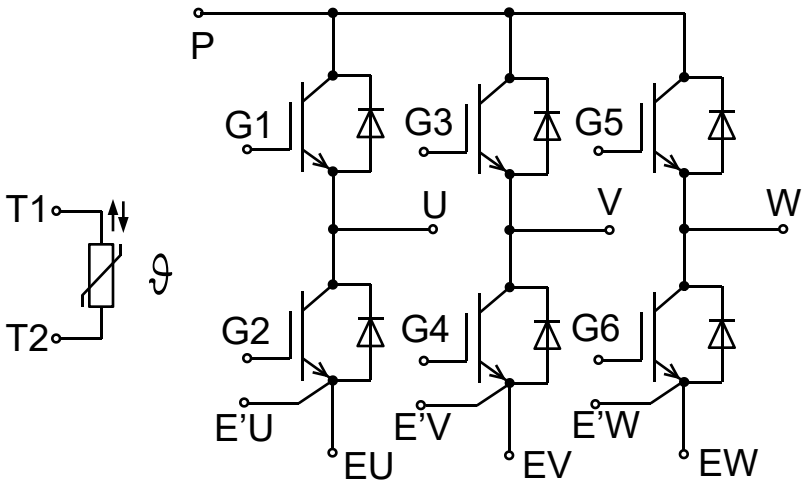


NTC-Thermistor-temperature characteristic (typical)

R = f (T)

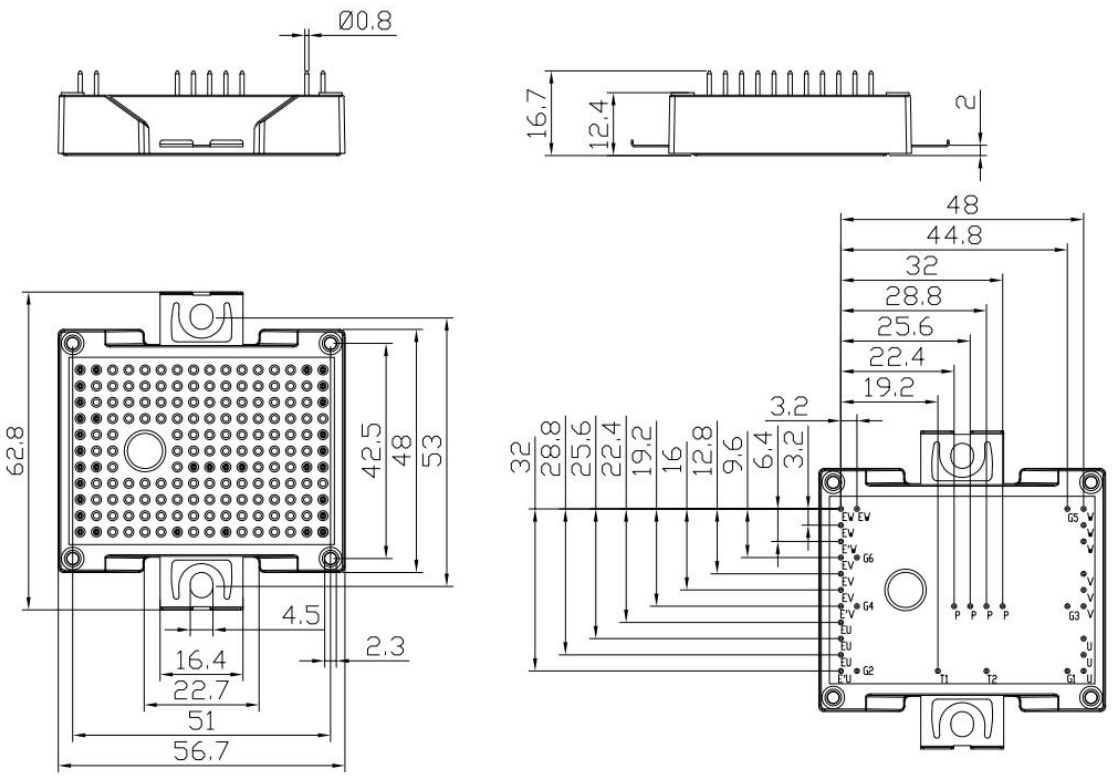


Circuit Diagram



Package Dimensions

(Dimensions in Millimeters)



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