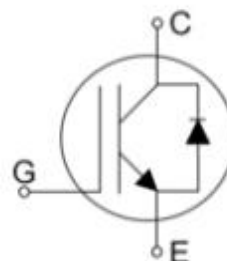


LEGP15N120AH

IGBT Discrete

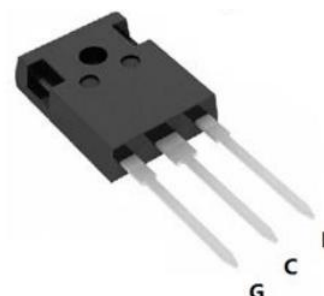
Features:

- 1200V/15A Trench Field Stop IGBT
- High breakdown voltage up to 1200V for improved reliability
- Trench-Stop Technology offering :
 - Low $V_{CE(sat)}$
 - Very tight parameter distribution
 - Short circuit withstand time – 10 μ s
 - High ruggedness, temperature stable
 - Easy parallel switching capability due to positive temperature coefficient in $V_{CE(sat)}$
- Enhanced avalanche capability



Applications:

- UPS
- Universal frequency conversion



Type	V_{CE}	I_C	$V_{CE(sat)}$ @ $I_C=15A$	Marking	Package
LEGP15N120AH	1200V	15A	1.8 V	GP15N120AH	TO-247-3L

Maximum Rated Values

Symbol	Parameter	Conditions	Ratings	Unit
V_{CES}	Collector-emitter voltage		1200	V
I_C	Continuous Collector Current	$T_C=25^{\circ}\text{C}$	30	A
		$T_C=100^{\circ}\text{C}$	15	A
I_F	Diode Forward current	$T_C=25^{\circ}\text{C}$	30	A
		$T_C=100^{\circ}\text{C}$	15	A
V_{GE}	Gate-Emitter Voltage		± 20	V
V_{GE}	Transient Gate-Emitter Voltage		± 30	V
I_{Cplus}	Pulsed collector current		60	A
I_{Fplus}	Diode Pulsed Current		60	A
T_{sc}	Short Circuit Withstand Time	Short Circuit Withstand Time	10	us
P_{tot}	Total Power Dissipation	$T_C=25^{\circ}\text{C}$	214	W
T_{vj}	Operating Junction Temperature	Operating Junction Temperature	-40...+175	$^{\circ}\text{C}$
T_{stg}	Storage Temperature	Storage Temperature	-55...+150	$^{\circ}\text{C}$
	Soldering temperature	wave soldering 1.6mm (0.063in.) from case for 10s	260	$^{\circ}\text{C}$
M	Mounting torque	M3 screw Maximum of mounting processes: 3	0.6	Nm

Thermal Resistance

Symbol	Parameter	Ratings	Unit
$R_{\theta(j-c)}$	IGBT thermal resistance, junction - case	0.7	K/W
$R_{\theta(j-c)}$	Diode thermal resistance, junction - case	1.2	K/W
$R_{\theta(j-a)}$	Thermal resistance, junction - ambient	40	K/W

Characteristics Values of the IGBT

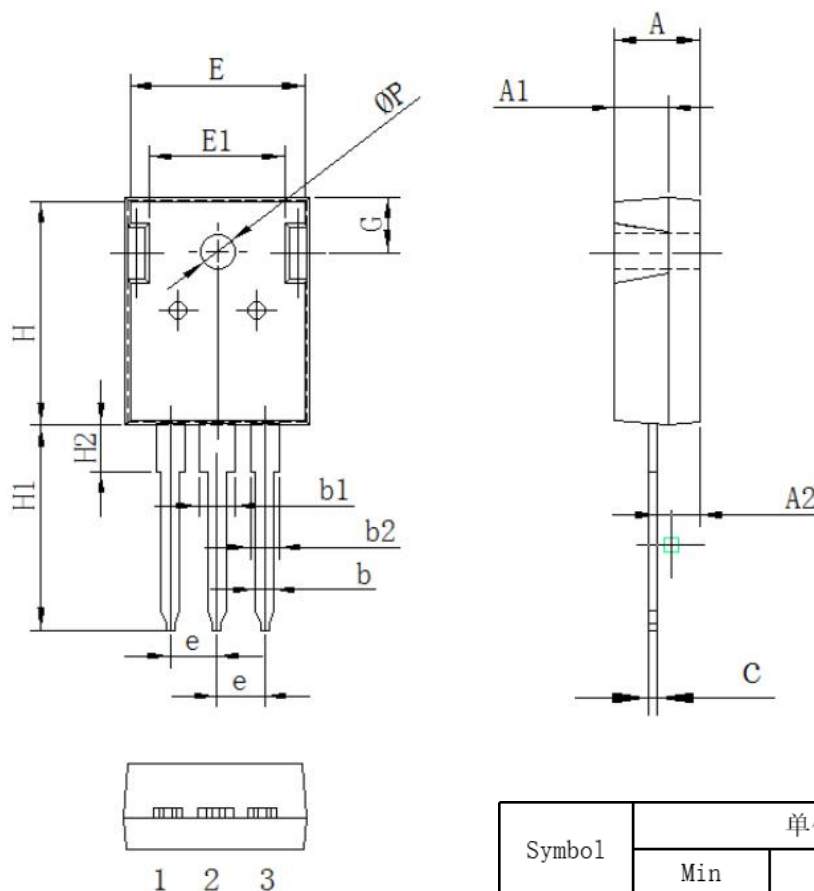
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{CES}	Collector-Emitter Breakdown Voltage	$V_{GE} = 0V, I_C = 0.25mA$	1200			V
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$I_C=15A, V_{GE}=15V, T_{vj}=25^{\circ}C$		1.8	2.2	V
		$I_C=15A, V_{GE}=15V, T_{vj}=150^{\circ}C$		2.2		V
		$I_C=15A, V_{GE}=15V, T_{vj}=175^{\circ}C$		2.3		V
$V_{GE(th)}$	Gate Threshold Voltage	$I_C=1.0mA, V_{CE}=V_{GE}$	5.0	5.8	6.5	V
I_{CES}	Collector-Emitter Cut-off Current	$V_{CE}=1200V, V_{GE}=0V, T_{vj}=25^{\circ}C$			0.1	mA
		$V_{CE}=1200V, V_{GE}=0V, T_{vj}=175^{\circ}C$			4.0	mA
I_{GES}	Gate-Emitter Leakage Current	$V_{CE}=0V, V_{GE}=20V, T_{vj}=25^{\circ}C$			250	nA
g_{FS}	Transconductance	$V_{CE}=20V, I_C=15A$		10		S
C_{ies}	Input Capacitance	$f = 1MHz, T_{vj} = 25^{\circ}C,$ $V_{CE} = 25V, V_{GE} = 0V$		1185		pF
C_{oes}	Output Capacitance			81		pF
C_{res}	Reverse Transfer Capacitance			35		pF
Q_G	Gate charge	$V_{CC}=600V, I_C=15A, V_{GE}=15V$		94		nC
$t_{d(on)}$	Turn-on Delay Time	$I_C=15A, V_{CE}=600V$ $V_{GE}=\pm 15V$ $R_G=10\Omega$ $T_{vj}=25^{\circ}C$		56		ns
t_r	Rise Time, Inductive Load			65		ns
$t_{d(off)}$	Turn-off Delay Time, Inductive Load			226		ns
t_f	Fall Time, Inductive Load			156		ns
E_{on}	Turn-on Energy Loss per Pulse			1.17		mJ
E_{off}	Turn-off Energy Loss			0.95		mJ
$t_{d(on)}$	Turn-on Delay Time	$I_C=15A, V_{CE}=600V$ $V_{GE}=\pm 15V$ $R_G=10\Omega$ $T_{vj}=125^{\circ}C$		48		ns
t_r	Rise Time, Inductive Load			63		ns
$t_{d(off)}$	Turn-off Delay Time, Inductive Load			312		ns
t_f	Fall Time, Inductive Load			266		ns
E_{on}	Turn-on Energy Loss per Pulse			1.28		mJ
E_{off}	Turn-off Energy Loss			1.55		mJ
I_{SC}	Short circuit collector current	$V_{GE}=15V, V_{CC}\leq 600V,$ $t_{SC}\leq 10\mu s, T_{vj}=175^{\circ}C$		60		A

Characteristics Values of the Diode

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
V_F	Forward Voltage	$I_F=15\text{ A}, T_{vj}=25\text{ }^{\circ}\text{C}$		2.0		V
		$I_F=15\text{ A}, T_{vj}=150\text{ }^{\circ}\text{C}$		1.6		V
		$I_F=15\text{ A}, T_{vj}=175\text{ }^{\circ}\text{C}$		1.5		V
t_{rr}	Reverse Recovery time	$I_F=15\text{ A}, V_R=600\text{ V}$ $-di/dt=170\text{ A/us}$ $T_{vj}=25\text{ }^{\circ}\text{C}$		153		ns
Q_r	Recovered Charge			0.44		μC
I_{rrm}	Diode peak reverse recovery current			6.2		A
t_{rr}	Reverse Recovery time	$I_F=15\text{ A}, V_R=600\text{ V}$ $-di/dt=170\text{ A/us}$ $T_{vj}=175\text{ }^{\circ}\text{C}$		400		ns
Q_r	Recovered Charge			2.3		μC
I_{rrm}	Diode peak reverse recovery current			14		A

Package Dimensions

TO-247-3L



Symbol	单位 mm		
	Min	Nom	Max
A	4.8	5.00	5.20
A1	3.3	3.5	3.7
A2	2.20	2.40	2.60
b	1.00	1.2	1.40
b1	2.90	3.10	3.30
b2	1.90	2.10	2.30
c	0.50	0.60	0.70
e	5.25	5.45	5.65
E	15.2	15.7	16.2
E1	10.2	10.7	11.2
H	20.8	21	21.2
H1	19.5	20.0	20.5
H2	4.00	4.20	4.40
G	5.60	5.80	6.00
ΦP	3.30	3.50	3.70

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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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