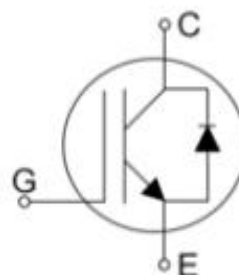


LEGP15N65AH

IGBT Discrete

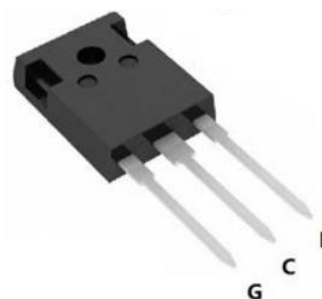
Features:

- 650V/15A Trench Field Stop IGBT
- High breakdown voltage up to 650V for improved reliability
- Trench-Stop Technology offering :
 - Low $V_{CE(sat)}$
 - High speed switching
 - Low switching losses
 - High ruggedness, temperature stable
 - Easy parallel switching capability due to positive temperature coefficient in $V_{CE(sat)}$
- Converter with high switching frequency



Applications:

- Soft switching applications
- Air conditioning
- Motor drive inverter



Type	V_{CE}	I_C	$V_{CE(sat)}$ @ $I_C=15A$	Marking	Package
LEGP15N65AH	650V	15A	1.43 V	GP15N65AH	TO-247-3L

Maximum Rated Values

Symbol	Parameter	Conditions	Ratings	Unit
V_{CES}	Collector-emitter voltage	$T_{vj}=25^{\circ}\text{C}$	650	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	$T_C=25^{\circ}\text{C}$	16	A
		$T_C=100^{\circ}\text{C}$	8	A
V_{GE}	Gate-Emitter Voltage		± 20	V
V_{GE}	Transient Gate-Emitter Voltage		± 30	V
I_{CRM}	Pulsed Collector Current		60	A
I_{Fplus}	Diode Pulsed Current		32	A
T_{sc}	Short Circuit Withstand Time	$V_{GE}=15\text{V}, V_{CE}=400\text{V}$	5	μs
P_{tot}	Total Power Dissipation	$T_C=25^{\circ}\text{C}$	166	W
T_{vj}	Operating Junction Temperature	Operating Junction Temperature	$-55\dots+175$	$^{\circ}\text{C}$
T_{stg}	Storage Temperature	Storage Temperature	$-55\dots+150$	$^{\circ}\text{C}$
	Soldering temperature	wave soldering 1.6mm (0.063in.) from case for 10s	260	$^{\circ}\text{C}$

Thermal Resistance

Symbol	Parameter	Ratings	Unit
$R_{\theta(j-c)}$	IGBT thermal resistance, junction - case	0.9	K/W
$R_{\theta(j-a)}$	Thermal resistance, junction - ambient	40	K/W

Characteristics Values of the IGBT

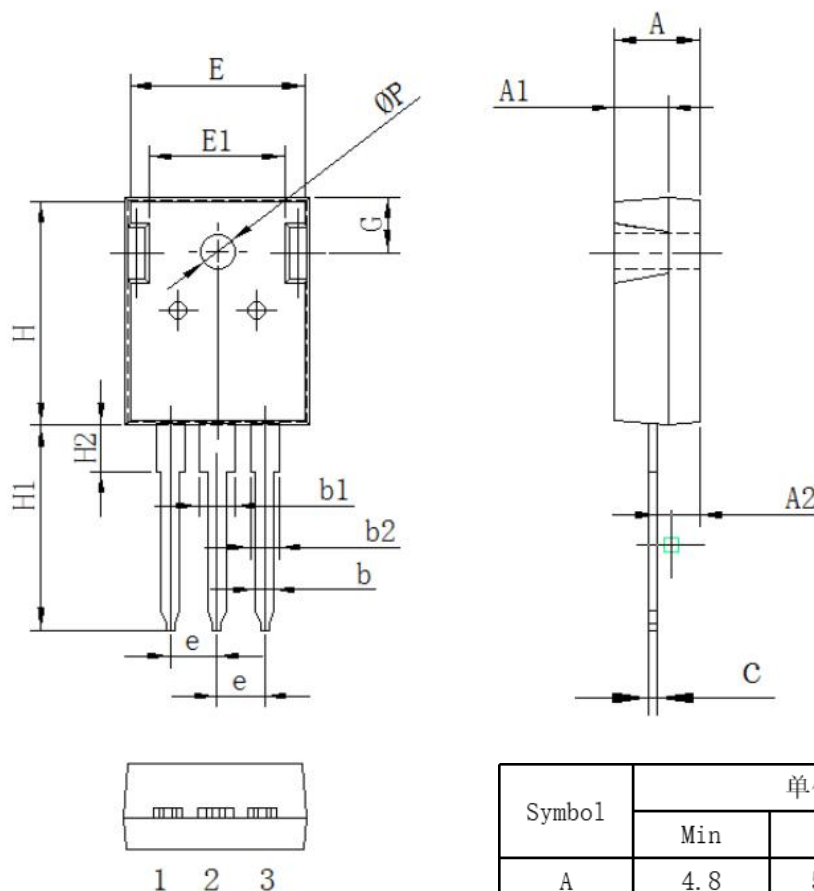
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{CES}	Collector-Emitter Breakdown Voltage	$V_{GE} = 0V, I_C = 0.25mA$	650			V
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$I_C=15A, V_{GE}=15V, T_{vj}=25^{\circ}C$		1.43		V
		$I_C=15A, V_{GE}=15V, T_{vj}=150^{\circ}C$		1.62		V
$V_{GE(th)}$	Gate Threshold Voltage	$I_C = 0.25mA, V_{CE}=V_{GE}$	5.0	5.64	6.5	V
I_{CES}	Collector-Emitter Cut-off Current	$V_{CE}=650V, V_{GE}=0V, T_{vj}=25^{\circ}C$			1	mA
I_{GES}	Gate-Emitter Leakage Current	$V_{CE}=0V, V_{GE}=20V, T_{vj}=25^{\circ}C$			100	nA
$t_{d(on)}$	Turn-on Delay Time	$I_C=15A, V_{CE}=300V$ $V_{GE}=\pm 15V$ $R_G=30\Omega$ $T_{vj}=25^{\circ}C$		28		ns
t_r	Rise Time, Inductive Load			27		ns
$t_{d(off)}$	Turn-off Delay Time, Inductive Load			106		ns
t_f	Fall Time, Inductive Load			97		ns
E_{on}	Turn-on Energy Loss per Pulse			0.41		mJ
E_{off}	Turn-off Energy Loss			0.13		mJ
$t_{d(on)}$	Turn-on Delay Time	$I_C=15A, V_{CE}=300V$ $V_{GE}=\pm 15V$ $R_G=30\Omega$ $T_{vj}=150^{\circ}C$		29		ns
t_r	Rise Time, Inductive Load			26		ns
$t_{d(off)}$	Turn-off Delay Time, Inductive Load			112		ns
t_f	Fall Time, Inductive Load			123		ns
E_{on}	Turn-on Energy Loss per Pulse			0.56		mJ
E_{off}	Turn-off Energy Loss			0.19		mJ
I_{SC}	Short circuit collector current	$V_{GE}=15V, t_{sc}\leq 5\mu s$ $V_{CC}=300V, T_j=25^{\circ}C$		60		A

Characteristics Values of the Diode

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
V_F	Forward Voltage	$I_F=8\text{ A}, T_{vj}=25\text{ }^{\circ}\text{C}$		1.22		V
		$I_F=8\text{ A}, T_{vj}=150\text{ }^{\circ}\text{C}$		1.09		V
I_{rr}	Reverse Recovery Current	$I_C=8\text{ A}, V_{CE}=300\text{ V}$ $di/dt=350\text{ A}/\mu\text{s}, T_{vj}=25\text{ }^{\circ}\text{C}$		9.7		A
Q_r	Recovered Charge			0.41		μC
E_{rec}	Reverse Recovery Energy			0.07		mJ
I_{rr}	Reverse Recovery Current	$I_C=8\text{ A}, V_{CE}=300\text{ V}$ $di/dt=350\text{ A}/\mu\text{s}, T_{vj}=150\text{ }^{\circ}\text{C}$		14.9		A
Q_r	Recovered Charge			0.85		μC
E_{rec}	Reverse Recovery Energy			0.13		mJ

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	600
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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