

LEGP50N70CHF

IGBT Discrete

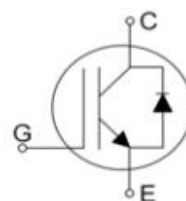
Features:

- 700V/50A Trench Field Stop IGBT
- High breakdown voltage up to 650V for improved reliability
- Trench-Stop Technology offering :
 - Low $V_{CE(sat)}$
 - High speed switching
 - High ruggedness, temperature stable
 - Easy parallel switching capability due to positive temperature coefficient in $V_{CE(sat)}$
- Enhanced avalanche capability

V_{CE}	700	V
I_C	50	A
$V_{CE(sat)} @ I_C=50A$	1.5	V

Applications:

- Uninterruptible Power Supplies
- Inverter
- Welding Converters
- PFC applications
- Converter with high switching frequency



TO-3P

Maximum Rated Values ($T_j = 25^\circ\text{C}$ unless otherwise specified)

Symbol	Parameter	Conditions	Ratings	Unit
V_{CE}	Collector-emitter voltage		700	V
I_C	Continuous Collector Current	$T_C = 25^\circ\text{C}$	80	A
		$T_C = 100^\circ\text{C}$	50	A
I_F	Diode Forward current	$T_C = 25^\circ\text{C}$	80	A
		$T_C = 100^\circ\text{C}$	50	A
V_{GE}	Continuous Gate-emitter voltage		± 20	V
V_{GE}	Transient Gate-emitter voltage		± 30	V
-	Turn off Safe Operating Area	$V_{CE} \leq 700\text{V}, T_j \leq 150^\circ\text{C}$	200	A
I_{CM}	Pulsed Collector Current	$V_{GE} = 15\text{V}, t_p$ limited by T_{jmax}	200	A
P_{tot}	Total Power Dissipation	$T_j = 25^\circ\text{C}$	280	W
T_j	Operating Junction Temperature		$-40 \dots +150$	$^\circ\text{C}$
T_{stg}	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	0.53	K/W
$R_{\theta(j-c)}$	Diode thermal resistance, junction - case	1.05	K/W
$R_{\theta(j-a)}$	Thermal resistance, junction - ambient	40	K/W

Characteristics Values of the IGBT ($T_j = 25^\circ\text{C}$ unless otherwise specified)

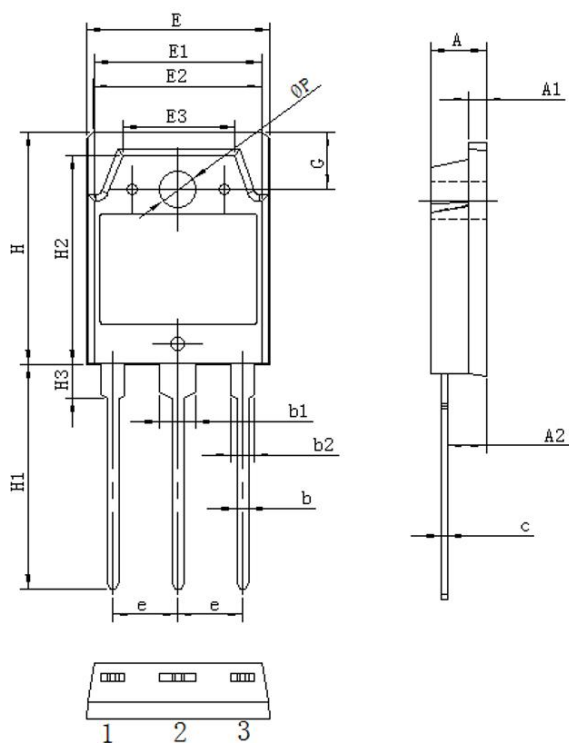
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{CES}	Collector-Emitter Breakdown Voltage	$V_{GE} = 0V, I_C = 250\mu A$	700	-	-	V
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$I_C = 50A, V_{GE} = 15V, T_j = 25^\circ\text{C}$	-	1.5	1.85	V
		$I_C = 50A, V_{GE} = 15V, T_j = 150^\circ\text{C}$	-	1.67	-	V
$V_{GE(th)}$	Gate Threshold Voltage	$I_C = 250\mu A, V_{CE} = V_{GE}$	5.2	6.0	6.5	V
I_{CES}	Collector-Emitter Cut-off Current	$V_{CE} = 700V, V_{GE} = 0V, T_j = 25^\circ\text{C}$	-	0.1	40	μA
		$V_{CE} = 700V, V_{GE} = 0V, T_j = 150^\circ\text{C}$	-	-	10	mA
I_{GES}	Gate-Emitter Leakage Current	$V_{CE} = 0V, V_{GE} = \pm 20V$			100	nA
g_{fs}	Transconductance	$I_C = 50A, V_{CE} = 20V$	-	52	-	S
C_{ies}	Input Capacitance	$V_{GE} = 0V, V_{CE} = 30V,$ $f = 1MHz$	-	3800	-	pF
C_{oes}	Output Capacitance		-	130	-	pF
C_{res}	Reverse Transfer Capacitance		-	70	-	pF
Q_G	Gate Charge	$V_{CC} = 520V, I_C = 50A,$ $V_{GE} = 15V$	-	158	-	nC
$t_{d(on)}$	Turn-on Delay Time	$I_C = 50A, V_{CC} = 400V$ $V_{GE} = 0/15V$ $R_g = 12\Omega$ $T_j = 25^\circ\text{C}$	-	32	-	ns
t_r	Rise Time		-	47	-	ns
$t_{d(off)}$	Turn-off Delay Time		-	89	-	ns
t_f	Fall Time		-	45	-	ns
E_{on}	Turn-on Energy Loss		-	2.2	-	mJ
E_{off}	Turn-off Energy Loss		-	0.89	-	mJ
$t_{d(on)}$	Turn-on Delay Time	$I_C = 50A, V_{CC} = 400V$ $V_{GE} = 0/15V$ $R_g = 12\Omega$ $T_j = 150^\circ\text{C}$	-	35	-	ns
t_r	Rise Time		-	51	-	ns
$t_{d(off)}$	Turn-off Delay Time		-	96	-	ns
t_f	Fall Time		-	53	-	ns
E_{on}	Turn-on Energy Loss		-	2.5	-	mJ
E_{off}	Turn-off Energy Loss		-	2.99	-	mJ

Characteristics Values of the Diode ($T_j = 25^\circ\text{C}$ unless otherwise specified)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
V_F	Forward Voltage	$I_F=50\text{ A}$	-	1.55	-	V
t_{rr}	Reverse Recovery time	$I_F=50\text{ A}, V_R=300\text{ V}$ $di/dt = 600\text{ A}/\mu\text{s}$ $T_j = 25^\circ\text{C}$	-	155	-	ns
I_{rr}	Reverse Recovery Current		-	17	-	A
Q_{rr}	Reverse Recovery Charge		-	1.67	-	μC
E_{rec}	Reverse Recovery Energy			0.33		mJ
t_{rr}	Reverse Recovery time	$I_F=50\text{ A}, V_R=300\text{ V}$ $di/dt = 600\text{ A}/\mu\text{s}$ $T_j = 150^\circ\text{C}$	-	155	-	ns
I_{rr}	Reverse Recovery Current		-	17	-	A
Q_{rr}	Reverse Recovery Charge		-	1.67	-	μC
E_{rec}	Reverse Recovery Energy			0.79		mJ

Package Dimensions

TO-3P



Symbol	单位 mm		
	Min	Nom	Max
A	4.60	4.80	5.00
A1	1.3	1.5	1.7
A2	1.20	1.40	1.60
b	0.80	1.0	1.20
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	15.6	16.0
E1	13.2	13.4	13.6
E2	13.1	13.3	13.5
E3	9.1	9.3	9.5
H	19.8	20.0	20.2
H1	20.1	20.3	20.5
H2	18.5	18.7	18.9
H3	3.2	3.5	3.8
G	4.8	5.0	5.2
ΦP	3.00	3.20	3.40

DISCLAIMER

ALL PRODUCT, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE
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