

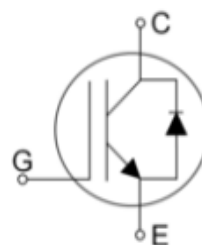
LEGP75N65AS

IGBT Discrete

Features:

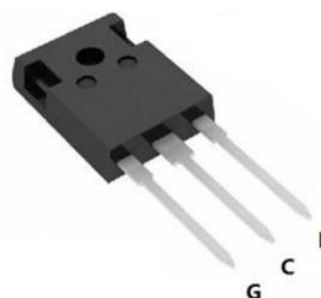
- 650V/75A Trench Field Stop IGBT
- High breakdown voltage up to 650V for improved reliability
- Trench-Stop Technology offering :
 - Low $V_{CE(sat)}$
 - High speed switching
 - High ruggedness, temperature stable
 - Easy parallel switching capability due to positive temperature coefficient in $V_{CE(sat)}$
- Enhanced avalanche capability

V_{CE}	650	V
I_C	75	A
$V_{CE(sat)} @ I_C=75A$	1.45	V



Applications:

- Uninterruptible Power Supplies
- PV Inverters
- Induction converters



TO-247

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

Symbol	Parameter	Conditions	Ratings	Unit
V_{CE}	Collector-emitter voltage		650	V
I_C	Continuous Collector Current	$T_C = 25^\circ\text{C}$	90	A
		$T_C = 100^\circ\text{C}$	75	A
I_F	Diode Forward current	$T_C = 25^\circ\text{C}$	90	A
		$T_C = 100^\circ\text{C}$	75	A
$I_{F, \text{pulse}}$	Diode pulsed current	$T_C = 25^\circ\text{C}$	300	A
V_{GES}	Continuous Gate-emitter voltage		± 20	V
V_{GES}	Transient Gate-emitter voltage	$T_P \leq 10\mu\text{s}, D < 0.01$	± 30	V
$I_{C, \text{pulse}}$	Pulsed Collector Current	$T_C = 25^\circ\text{C}$	300	A
P_{tot}	Power Dissipation	$T_C = 25^\circ\text{C}$	395	W
		$T_C = 100^\circ\text{C}$	198	W
T_j	Operating Junction Temperature		$-55 \dots +175$	$^\circ\text{C}$
T_{stg}	Storage Temperature		$-55 \dots +175$	$^\circ\text{C}$

Thermal Resistance

Symbol	Parameter	Ratings	Unit
$R_{\theta(j-c)}$	IGBT thermal resistance, junction - case	0.38	K/W
$R_{\theta(j-c)}$	Diode thermal resistance, junction - case	0.45	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	$V_{GE} = 0V, I_C = 0.5mA$	650	-	-	V
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$I_C = 75A, V_{GE} = 15V, T_j = 25^\circ\text{C}$	-	1.45	1.85	V
		$I_C = 75A, V_{GE} = 15V, T_j = 125^\circ\text{C}$	-	1.66	-	V
		$I_C = 75A, V_{GE} = 15V, T_j = 175^\circ\text{C}$	-	1.79	-	V
$V_{GE(th)}$	Gate Threshold Voltage	$I_C = 500\mu A, V_{CE} = V_{GE}$	3.5	4.5	5.5	V
I_{CES}	Collector-Emitter Cut-off Current	$V_{CE} = 650V, V_{GE} = 0V, T_j = 25^\circ\text{C}$	-		10	μA
I_{GES}	Gate-Emitter Leakage Current	$V_{CE} = 0V, V_{GE} = 20V$			100	nA
C_{ies}	Input Capacitance	$V_{GE} = 0V, V_{CE} = 25V,$ $f = 100kHz$	-	7428	-	pF
C_{oes}	Output Capacitance		-	241	-	pF
C_{res}	Reverse Transfer Capacitance		-	70	-	pF
$t_{d(on)}$	Turn-on Delay Time	$I_C = 75A, V_{CC} = 400V$ $V_{GE} = 15V$ $R_g = 10\Omega$ $T_j = 25^\circ\text{C}$	-	71	-	ns
t_r	Rise Time		-	118	-	ns
$t_{d(off)}$	Turn-off Delay Time		-	315	-	ns
t_f	Fall Time		-	88	-	ns
E_{on}	Turn-on Energy Loss		-	2.95	-	mJ
E_{off}	Turn-off Energy Loss		-	1.1	-	mJ
$t_{d(on)}$	Turn-on Delay Time	$I_C = 30A, V_{CC} = 400V$ $V_{GE} = 15V$ $R_g = 10\Omega$ $T_j = 25^\circ\text{C}$	-	58	-	ns
t_r	Rise Time		-	55	-	ns
$t_{d(off)}$	Turn-off Delay Time		-	355	-	ns
t_f	Fall Time		-	52	-	ns
E_{on}	Turn-on Energy Loss		-	0.83	-	mJ
E_{off}	Turn-off Energy Loss		-	0.3	-	mJ

Gate Charge Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
Q_g	Total gate Charge	$I_C = 75A, V_{CC} = 520V, V_{GE} = 15V$	-	218	-	nC
Q_{ge}	Gate – emitter Charge		-	110	-	nC
Q_{gc}	Gate – collector Charge		-	58	-	nC

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

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
V_F	Diode Forward Voltage	$V_{GE}=0V, I_F=75A, T_j=25^\circ\text{C}$	-	1.68	1.9	V
		$V_{GE}=0V, I_F=75A, T_j=125^\circ\text{C}$	-	1.56	-	V
		$V_{GE}=0V, I_F=75A, T_j=175^\circ\text{C}$	-	1.46	-	V
t_{rr}	Reverse Recovery time	$I_F=75A, V_R=400V$ $di/dt = 500A/\mu s$	-	98	-	ns
I_{rrm}	Peak Reverse Recovery Current		-	16	-	A
Q_{rr}	Reverse Recovery Charge		-	920	-	nC

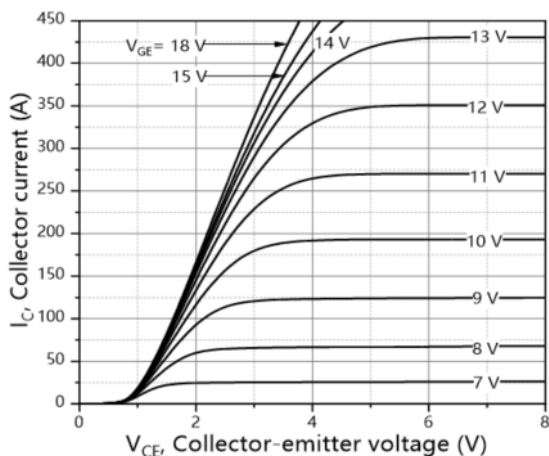


Figure 1. Typical output characteristics
($T_{vj}=25^{\circ}\text{C}$)

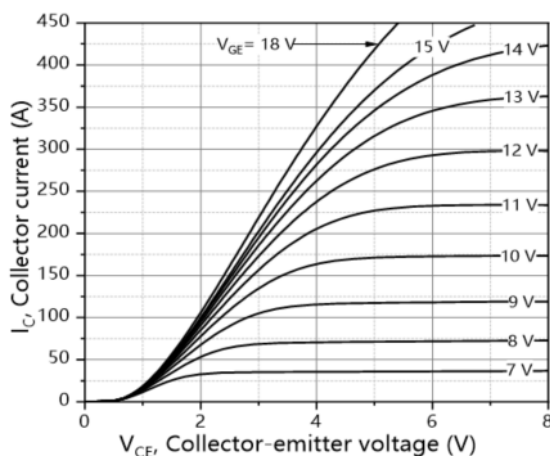


Figure 2. Typical output characteristics
($T_{vj}=150^{\circ}\text{C}$)

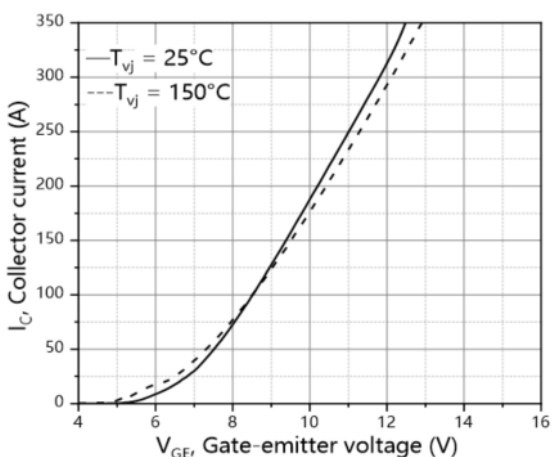


Figure 3. Typical transfer characteristics
($V_{CE}=20\text{V}$)

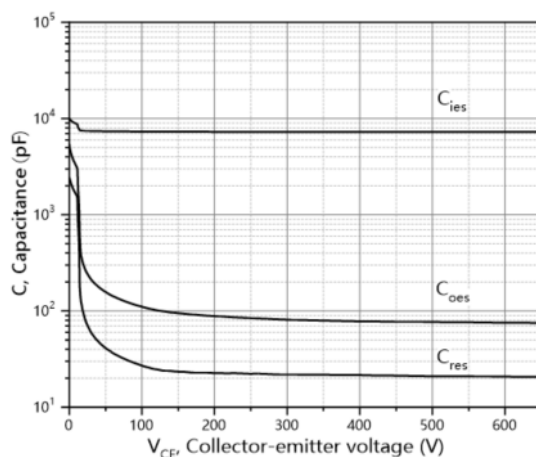


Figure 4. Typical capacitance
($V_{GE}=0\text{V}$, $f=100\text{ kHz}$)

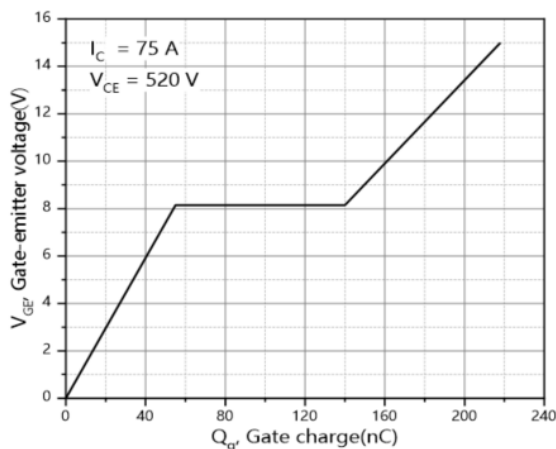


Figure 5. Typical gate charge

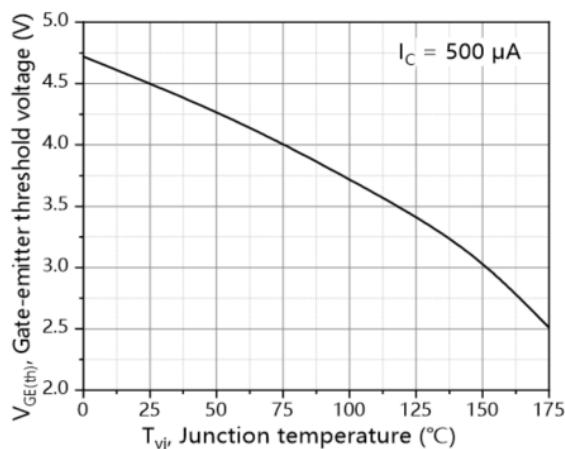


Figure 6. Gate-emitter threshold voltage

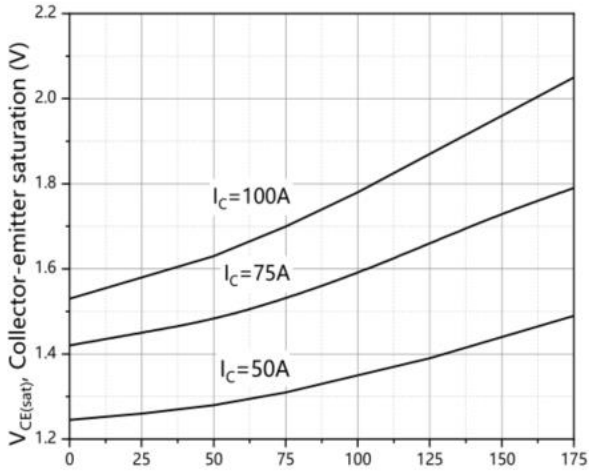


Figure 7. Typical collector-emitter voltage

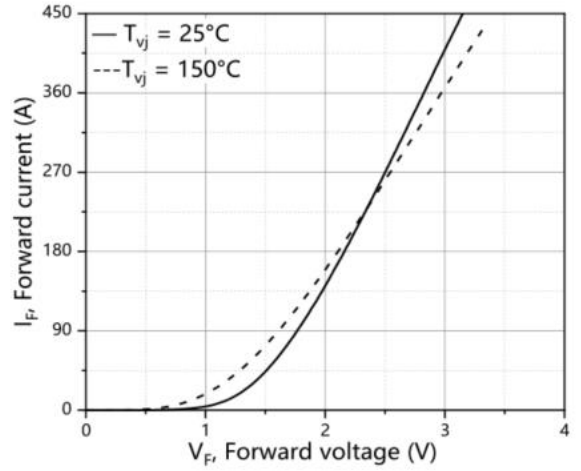


Figure 8. Forward characteristic of diode

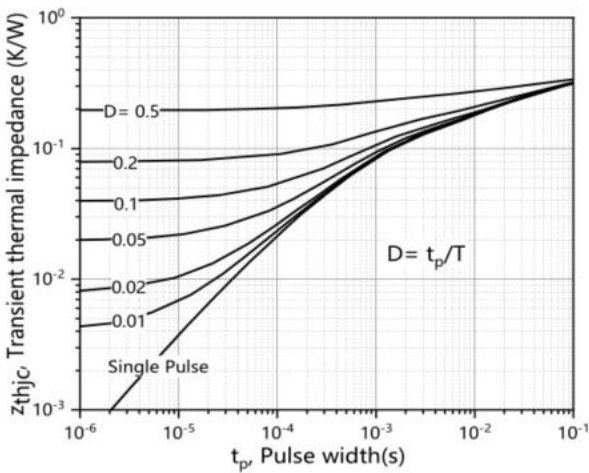


Figure 9. IGBT transient thermal impedance

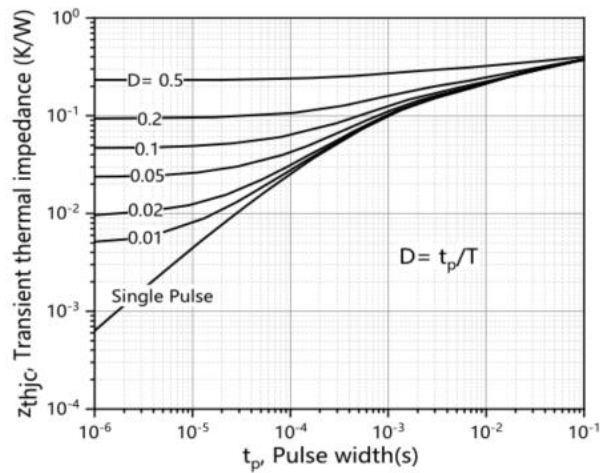
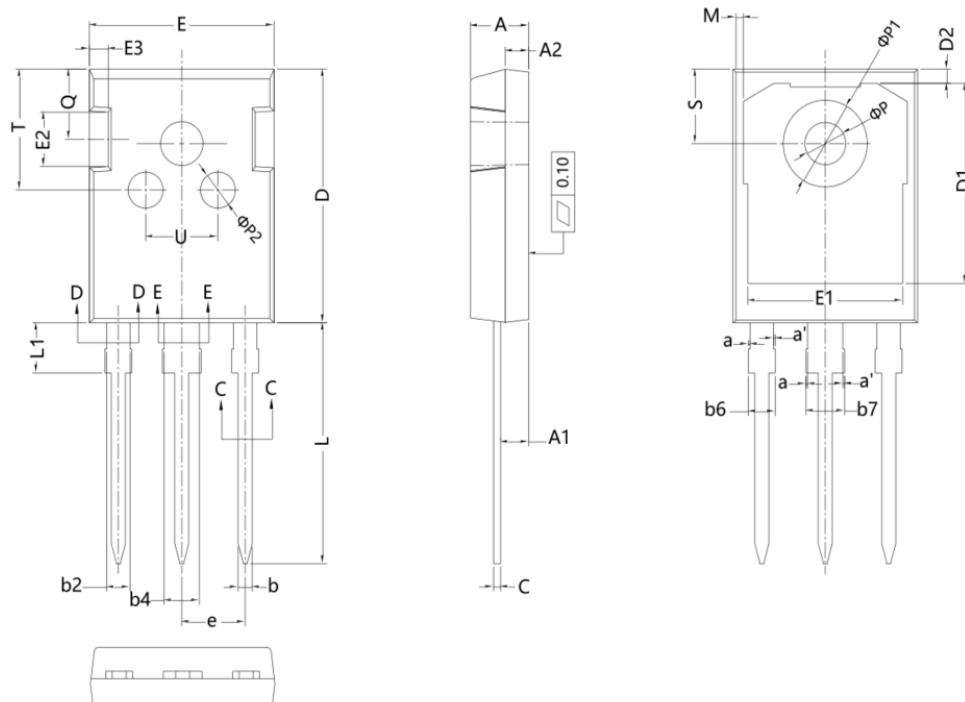


Figure 10. Diode transient thermal impedance

Package Dimensions



Symbol	mm		
	Min	Nom	Max
A	4.90	5.00	5.10
A1	2.31	2.41	2.51
A2	1.90	2.00	2.10
a	0.00	-	0.15
a'	0.00	-	0.15
b	1.16	-	1.26
b2	1.96	-	2.06
b4	2.96	-	3.06
b6	-	-	2.25
b7	-	-	3.25
c	0.59	-	0.66
D	20.90	21.00	21.10
D1	16.25	16.55	16.85
D2	1.05	1.17	1.35
E	15.70	15.80	15.90
E1	13.10	13.30	13.50
E2	4.40	4.50	4.60
E3	1.50	1.60	1.70
e	5.436 BSC		
L	19.80	19.92	20.10
L1	-	-	4.30
M	0.35	-	0.95
P	3.40	3.50	3.60
P1	7.00	-	7.40
P2	2.40	2.5	2.6
Q	5.60	-	6.0
S	6.05	6.15	6.25
T	9.8	-	10.20
U	6.00	-	6.40

Version 1: TO247-J package outline dimension

DISCLAIMER

ALL PRODUCT, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE
TO IMPROVE RELIABILITY, FUNCTION OR DESIGN OR OTHERWISE