Field Stop Trench IGBT

650 V, 75 A, TO247

AFGHL75T65SQ

Using the novel field stop 4th generation IGBT technology, AFGHL75T65SQ offers the optimum performance with both low conduction and switching losses for high efficiency operations in various applications, which does not require reverse recovery specification.

- Maximum Junction Temperature: T_J = 175°C
- Positive Temperature Co−efficient for Easy Parallel Operating
- High Current Capability
- Low Saturation Voltage: $V_{CE(Sat)}$ = 1.6 V (Typ.) @ I_C = 75 A
- 100% of the Parts are Tested for I_{LM} (Note 2)
- Fast Switching
- Tight Parameter Distribution
- AEC−Q101 Qualified and PPAP Capable

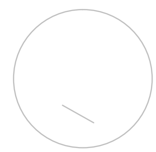
- Automotive
- On & Off Board Chargers
- DC−DC Converters
- PFC
- Industrial Inverter

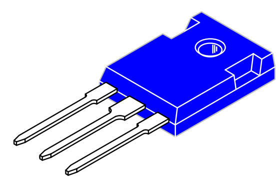
Collector−to−Emitter Voltage	V_{CES}	650	V
Gate−to−Emitter Voltage Transient Gate−to−Emitter Voltage	V_{GES}	±20 ±30	V
Collector Current (Note 1) @ T_C = 25°C @ T_C = 100°C	I_C	80 75	A
Pulsed Collector Current (Note 2)	I_{LM}	300	A
Pulsed Collector Current (Note 3)	I_{CM}	300	A
Maximum Power Dissipation @ T_C = 25°C @ T_C = 100°C	P_D	375 188	W
Operating Junction / Storage Temperature Range	T_J, T_{STG}	−55 to +175	°C
Maximum Lead Temp. for Soldering Purposes, 1/8″ from case for 10 seconds	T_L	265	°C

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

1. Value limited by bond wire
2. V_{CC} = 400 V, V_{GE} = 15 V, I_C = 300 A, R_G = 15 Ω, Inductive Load, 100% of the Parts are Tested.
3. Repetitive Rating: pulse width limited by max. Junction temperature

AFGHL75T65SQ	TO−247−3L	30 Units / Rail

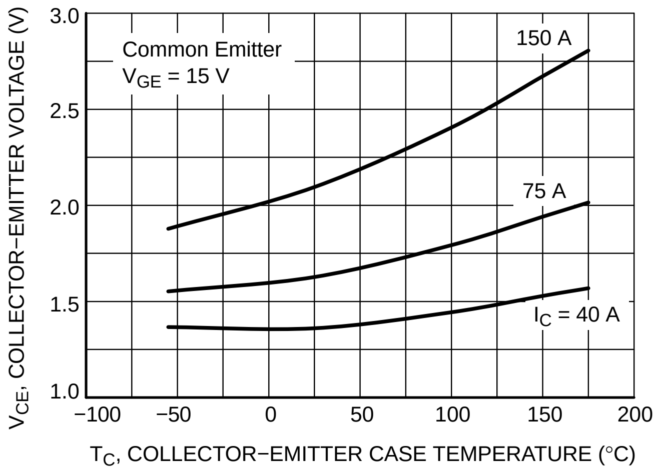


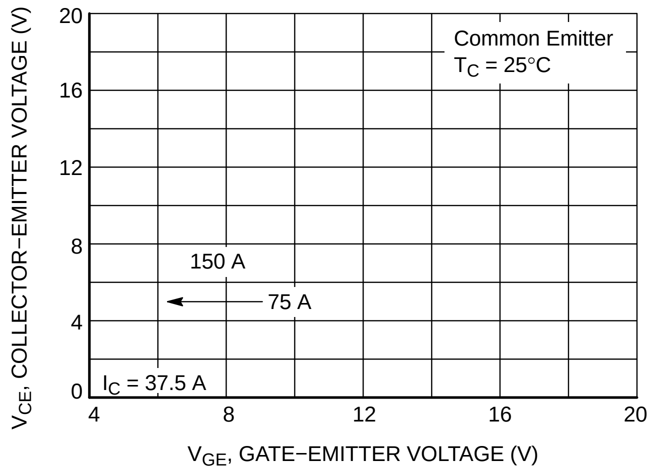


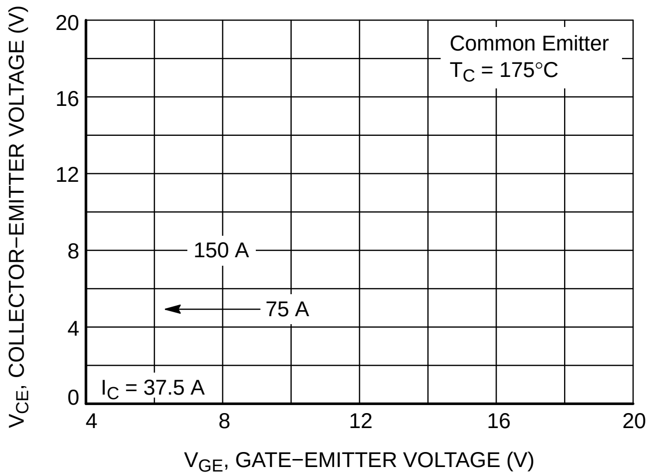
Thermal resistance junction−to−case, for IGBT	$R_{\theta JC}$	0.4	°C/W
Thermal resistance junction−to−ambient	$R_{\theta JA}$	40	°C/W

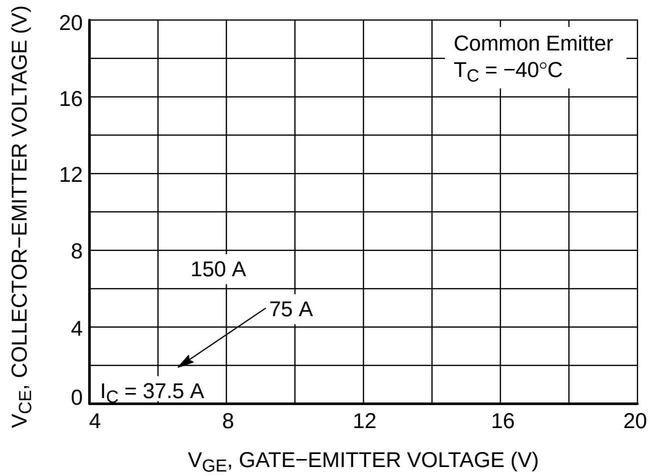
(T_J = 25°C unless otherwise noted)

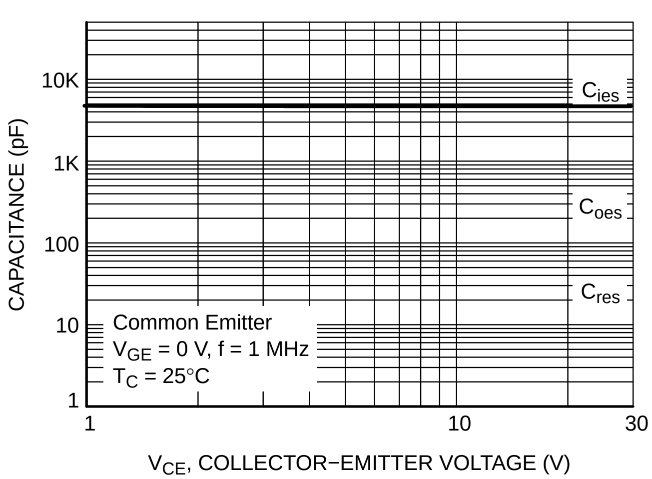
Collector−emitter breakdown voltage, gate−emitter short−circuited	V_{GE} = 0 V, I_C = 1 mA	BV_{CES}	650	−	−	V
Temperature Coefficient of Breakdown Voltage	V_{GE} = 0 V, I_C = 1 mA	$\frac{\Delta BV_{CES}}{\Delta T_J}$	−	0.6	−	V/°C
Collector−emitter cut−off current, gate−emitter short−circuited	V_{GE} = 0 V, V_{CE} = 650 V	I_{CES}	−	−	250	μA

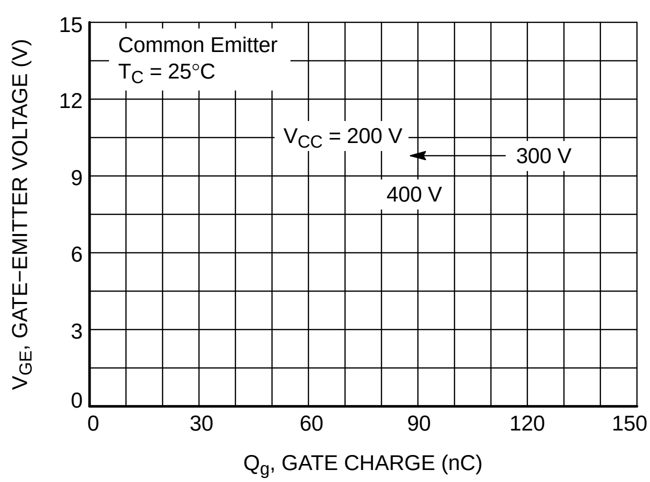

Common Emitter
V_{GE} = 15 V
150 A
75 A
I_C = 40 A
3.0
2.5
2.0
1.5
1.0
−100
−50
0
50
100
150
200
V_{CE}, COLLECTOR−EMITTER VOLTAGE (V)
T_C, COLLECTOR−EMITTER CASE TEMPERATURE (°C)

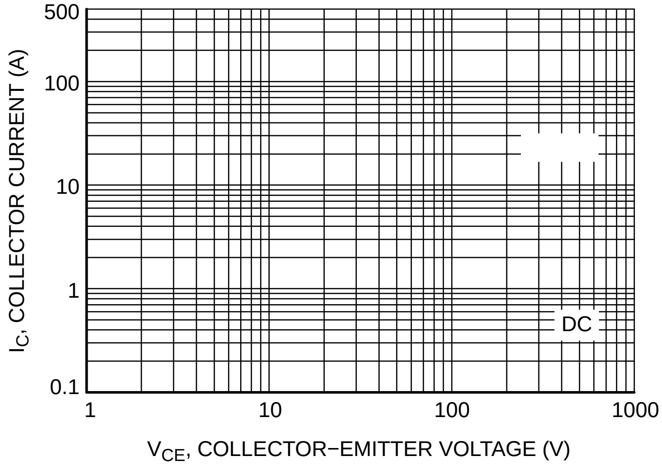

Common Emitter
T_C = 25°C
150 A
75 A
I_C = 37.5 A
20
16
12
8
4
0
4
8
12
16
20
V_{CE}, COLLECTOR−EMITTER VOLTAGE (V)
V_{GE}, GATE−EMITTER VOLTAGE (V)


Common Emitter
T_C = 175°C
150 A
75 A
I_C = 37.5 A
20
16
12
8
4
0
4
8
12
16
20
V_{CE}, COLLECTOR−EMITTER VOLTAGE (V)
V_{GE}, GATE−EMITTER VOLTAGE (V)


Common Emitter
T_C = −40°C
150 A
75 A
I_C = 37.5 A
20
16
12
8
4
0
4
8
12
16
20
V_{CE}, COLLECTOR−EMITTER VOLTAGE (V)
V_{GE}, GATE−EMITTER VOLTAGE (V)


C_{ies}
C_{oes}
C_{res}
Common Emitter
V_{GE} = 0 V, f = 1 MHz
T_C = 25°C
10K
1K
100
10
1
1
10
30
CAPACITANCE (pF)
V_{CE}, COLLECTOR−EMITTER VOLTAGE (V)


Common Emitter
T_C = 25°C
V_{CC} = 200 V
300 V
400 V
15
12
9
6
3
0
0
30
60
90
120
150
V_{GE}, GATE−EMITTER VOLTAGE (V)
Q_g, GATE CHARGE (nC)



500
100
10
1
0.1
1
10
100
1000
DC
I_C, COLLECTOR CURRENT (A)
V_{CE}, COLLECTOR−EMITTER VOLTAGE (V)