Maximum Ratings

For optimum lifetime and reliability, Infineon recommends operating conditions that do not exceed 80% of the maximum ratings stated in this datasheet.

Parameter	Symbol	Value	Unit
Collector-emitter voltage, $T_{vj} \geq 25°C$	V_{CE}	650	V
DC collector current, limited by T_{vjmax} T_C = 25°C value limited by bondwire T_C = 100°C	I_C	 120.0 75.0	A
Pulsed collector current, t_p limited by T_{vjmax} [1)]	I_{Cpuls}	300.0	A
Turn off safe operating area $V_{CE} \leq 650V$, $T_{vj} \leq 175°C$, t_p = 1µs [1)]	-	300.0	A
Gate-emitter voltage Transient Gate-emitter voltage ($t_p \leq 10µs$, $D < 0.010$)	V_{GE}	±20 ±30	V
Power dissipation T_C = 25°C Power dissipation T_C = 100°C	P_{tot}	395.0 198.0	W
Operating junction temperature	T_{vj}	-40...+175	°C
Storage temperature	T_{stg}	-55...+150	°C
Soldering temperature, wave soldering 1.6mm (0.063in.) from case for 10s		260	°C
Mounting torque, M3 screw, PG-TO247-pin123 Maximum of mounting processes: 3	M	0.6	Nm

Thermal Resistance

Parameter	Symbol	Conditions	Value			Unit
			min.	typ.	max.	
R_{th} Characteristics						
IGBT thermal resistance, junction - case	$R_{th(j-C)}$		-	-	0.38	K/W
Thermal resistance junction - ambient	$R_{th(j-a)}$		-	-	40	K/W

Electrical Characteristic, at T_{vj} = 25°C, unless otherwise specified

Parameter	Symbol	Conditions	Value			Unit
			min.	typ.	max.	
Static Characteristic						
Collector-emitter breakdown voltage	$V_{(BR)CES}$	V_{GE} = 0V, I_C = 0.20mA	650	-	-	V
Collector-emitter saturation voltage	V_{CEsat}	V_{GE} = 15.0V, I_C = 75.0A T_{vj} = 25°C T_{vj} = 125°C T_{vj} = 175°C	 - - -	 1.65 1.85 1.95	 2.10 - -	V
Gate-emitter threshold voltage	$V_{GE(th)}$	I_C = 0.75mA, V_{CE} = V_{GE}	3.2	4.0	4.8	V
Zero gate voltage collector current	I_{CES}	V_{CE} = 650V, V_{GE} = 0V T_{vj} = 25°C T_{vj} = 175°C	 - -	 0 800	 75 -	µA
Gate-emitter leakage current	I_{GES}	V_{CE} = 0V, V_{GE} = 20V	-	-	100	nA
Transconductance	g_{fs}	V_{CE} = 20V, I_C = 75.0A	-	104.0	-	S

[1)] Defined by design. Not subject to production test.

Electrical Characteristic, at T_{vj} = 25°C, unless otherwise specified

Parameter	Symbol	Conditions	Value			Unit
			min.	typ.	max.	
Dynamic Characteristic						
Input capacitance	C_{ies}	V_{CE} = 25V, V_{GE} = 0V, f = 1MHz	-	3800	-	pF
Output capacitance	C_{oes}		-	80	-	
Reverse transfer capacitance	C_{res}		-	17	-	
Gate charge	Q_G	V_{CC} = 520V, I_C = 75.0A, V_{GE} = 15V	-	160.0	-	nC
Internal emitter inductance measured 5mm (0.197 in.) from case	L_E		-	13.0	-	nH

Switching Characteristic, Inductive Load

Parameter	Symbol	Conditions	Value			Unit
			min.	typ.	max.	
IGBT Characteristic, at T_{vj} = 25°C						
Turn-on delay time	$t_{d(on)}$	T_{vj} = 25°C, V_{CC} = 400V, I_C = 75.0A, V_{GE} = 0.0/15.0V, $R_{G(on)}$ = 8.0Ω, $R_{G(off)}$ = 8.0Ω, Lσ = 30nH, Cσ = 25pF Lσ, Cσ from Fig. E Energy losses include “tail” and diode reverse recovery. Diode from IKW75N65EH5.	-	28	-	ns
Rise time	t_r		-	33	-	ns
Turn-off delay time	$t_{d(off)}$		-	174	-	ns
Fall time	t_f		-	41	-	ns
Turn-on energy	E_{on}		-	2.25	-	mJ
Turn-off energy	E_{off}		-	0.95	-	mJ
Total switching energy	E_{ts}		-	3.20	-	mJ
Turn-on delay time	$t_{d(on)}$	T_{vj} = 25°C, V_{CC} = 400V, I_C = 37.5A, V_{GE} = 0.0/15.0V, $R_{G(on)}$ = 8.0Ω, $R_{G(off)}$ = 8.0Ω, Lσ = 30nH, Cσ = 25pF Lσ, Cσ from Fig. E Energy losses include “tail” and diode reverse recovery. Diode from IKW75N65EH5.	-	25	-	ns
Rise time	t_r		-	14	-	ns
Turn-off delay time	$t_{d(off)}$		-	178	-	ns
Fall time	t_f		-	18	-	ns
Turn-on energy	E_{on}		-	0.90	-	mJ
Turn-off energy	E_{off}		-	0.30	-	mJ
Total switching energy	E_{ts}		-	1.20	-	mJ