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} [1)] $T_c = 25°C$ $T_c = 100°C$	I_C	 34.0 21.0	A
Pulsed collector current, t_p limited by T_{vjmax}	I_{Cpuls}	57.5	A
Turn off safe operating area $V_{CE} \leq 650V$, $T_{vj} \leq 175°C$	-	57.5	A
Diode forward current, limited by T_{vjmax} [1)] $T_c = 25°C$ $T_c = 100°C$	I_F	 24.0 14.0	A
Diode pulsed current, t_p limited by T_{vjmax}	I_{Fpuls}	57.5	A
Gate-emitter voltage Transient Gate-emitter voltage ($t_p \leq 10µs$, $D < 0.010$)	V_{GE}	±20 ±30	V
Short circuit withstand time $V_{GE} = 15.0V$, $V_{CC} \leq 360V$ Allowed number of short circuits < 1000 Time between short circuits: ≥ 1.0s $T_{vj} = 150°C$	t_{SC}	 3	µs
Power dissipation $T_c = 25°C$ Power dissipation $T_c = 100°C$	P_{tot}	35.3 17.6	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, M2.5 screw Maximum of mounting processes: 3	M	0.5	Nm
Isolation voltage RMS, $f = 50/60Hz$, $t = 1min$	V_{isol}	2500	V

Thermal Resistance

Parameter	Symbol	Conditions	Value			Unit
			min.	typ.	max.	
R_{th} Characteristics						
IGBT thermal resistance, junction - case	$R_{th(j-c)}$		-	-	4.30	K/W
Diode thermal resistance, junction - case	$R_{th(j-c)}$		-	-	5.80	K/W
Thermal resistance junction - ambient	$R_{th(j-a)}$		-	-	65	K/W

[1)] Limited by maximum junction temperature. Applicable for TO220 standard package.

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

Parameter	Symbol	Conditions	Value			Unit
			min.	typ.	max.	
Static Characteristic						
Collector-emitter breakdown voltage[1)]	$V_{(BR)CES}$	V_{GE} = 0V, I_C = 0.10mA	650	-	-	V
Collector-emitter saturation voltage	V_{CEsat}	V_{GE} = 15.0V, I_C = 11.5A T_{vj} = 25°C T_{vj} = 125°C T_{vj} = 150°C	 - - -	 1.50 1.65 1.75	 1.90 - -	V
Diode forward voltage	V_F	V_{GE} = 0V, I_F = 11.5A T_{vj} = 25°C T_{vj} = 125°C T_{vj} = 150°C	 - - -	 1.50 1.48 1.43	 1.95 - -	V
Gate-emitter threshold voltage	$V_{GE(th)}$	I_C = 0.20mA, V_{CE} = V_{GE}	4.8	5.6	6.4	V
Zero gate voltage collector current	I_{CES}	V_{CE} = 650V, V_{GE} = 0V T_{vj} = 25°C T_{vj} = 150°C	 - -	 - 450	 30 -	µA
Gate-emitter leakage current	I_{GES}	V_{CE} = 0V, V_{GE} = 20V	-	-	100	nA
Transconductance	g_{fs}	V_{CE} = 20V, I_C = 11.5A	-	11.6	-	S

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	-	1020	-	pF
Output capacitance	C_{oes}		-	50	-	
Reverse transfer capacitance	C_{res}		-	20	-	
Gate charge	Q_G	V_{CC} = 520V, I_C = 11.5A, V_{GE} = 15V	-	37.0	-	nC
Internal emitter inductance measured 5mm (0.197 in.) from case	L_E		-	7.0	-	nH
Short circuit collector current Max. 1000 short circuits Time between short circuits: ≥ 1.0s	$I_{C(SC)}$	V_{GE} = 15.0V, V_{CC} ≤ 360V, t_{SC} ≤ 3µs T_{vj} = 150°C	-	120	-	A

[1)] Measured with filter network.