

Sixth generation, high speed soft switching series

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, $T_{vj} \geq 25^{\circ}\text{C}$	V_{CE}	1200	V
DC collector current, limited by T_{vjmax} $T_c = 25^{\circ}\text{C}$ $T_c = 100^{\circ}\text{C}$	I_C	30.0 15.0	A
Pulsed collector current, t_p limited by T_{vjmax}	I_{Cpuls}	60.0	A
Turn off safe operating area $V_{CE} \leq 1200\text{V}$, $T_{vj} \leq 175^{\circ}\text{C}$	-	60.0	A
Diode forward current, limited by T_{vjmax} $T_c = 25^{\circ}\text{C}$ $T_c = 100^{\circ}\text{C}$	I_F	15.0 7.5	A
Diode pulsed current, t_p limited by T_{vjmax}	I_{Fpuls}	60.0	A
Gate-emitter voltage Transient Gate-emitter voltage ($t_p \leq 0.5\mu\text{s}$, $D < 0.001$)	V_{GE}	± 20 25	V
Short circuit withstand time $V_{GE} = 15.0\text{V}$, $V_{CC} \leq 500\text{V}$ Allowed number of short circuits < 1000 Time between short circuits: $\geq 1.0\text{s}$ $T_{vj} = 150^{\circ}\text{C}$	t_{SC}	3	μs
Power dissipation $T_c = 25^{\circ}\text{C}$ Power dissipation $T_c = 100^{\circ}\text{C}$	P_{tot}	200.0 100.0	W
Operating junction temperature	T_{vj}	-40...+175	$^{\circ}\text{C}$
Storage temperature	T_{stg}	-55...+150	$^{\circ}\text{C}$
Soldering temperature, wave soldering 1.6mm (0.063in.) from case for 10s		260	$^{\circ}\text{C}$
Mounting torque, M3 screw 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	$R_{th(j-c)}$		-	-	0.74	K/W
Diode thermal resistance, junction - case	$R_{th(j-c)}$		-	-	2.40	K/W
Thermal resistance junction - ambient	$R_{th(j-a)}$		-	-	40	K/W

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Electrical Characteristic, at $T_{vj} = 25^{\circ}\text{C}$, unless otherwise specified

Parameter	Symbol	Conditions	Value			Unit
			min.	typ.	max.	
Static Characteristic						
Collector-emitter saturation voltage	V_{CEsat}	$V_{GE} = 15.0\text{V}$, $I_C = 15.0\text{A}$ $T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$ $T_{vj} = 175^{\circ}\text{C}$	- - -	1.90 2.20 2.35	2.30 - -	V
Diode forward voltage	V_F	$V_{GE} = 0\text{V}$, $I_F = 7.5\text{A}$ $T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 175^{\circ}\text{C}$	- -	2.00 2.00	2.40 -	V
Diode forward voltage	V_F	$V_{GE} = 0\text{V}$, $I_F = 15.0\text{A}$ $T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 175^{\circ}\text{C}$	- -	2.65 2.75	3.20 -	V
Gate-emitter threshold voltage	$V_{GE(th)}$	$I_C = 0.50\text{mA}$, $V_{CE} = V_{GE}$	5.1	5.7	6.3	V
Zero gate voltage collector current	I_{CES}	$V_{CE} = 1200\text{V}$, $V_{GE} = 0\text{V}$ $T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 175^{\circ}\text{C}$	- -	- 450	250 -	μA
Gate-emitter leakage current	I_{GES}	$V_{CE} = 0\text{V}$, $V_{GE} = 20\text{V}$	-	-	600	nA
Transconductance	g_{fs}	$V_{CE} = 20\text{V}$, $I_C = 15.0\text{A}$	-	10.0	-	S

Electrical Characteristic, at $T_{vj} = 25^{\circ}\text{C}$, unless otherwise specified

Parameter	Symbol	Conditions	Value			Unit
			min.	typ.	max.	
Dynamic Characteristic						
Input capacitance	C_{ies}	$V_{CE} = 25\text{V}$, $V_{GE} = 0\text{V}$, $f = 1\text{MHz}$	-	860	-	pF
Output capacitance	C_{oes}		-	60	-	
Reverse transfer capacitance	C_{res}		-	40	-	
Gate charge	Q_G	$V_{CC} = 960\text{V}$, $I_C = 15.0\text{A}$, $V_{GE} = 15\text{V}$	-	92.0	-	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 $T_{vj} = 25^{\circ}\text{C}$						
Turn-on delay time	$t_{d(on)}$	$T_{vj} = 25^{\circ}\text{C}$, $V_{CC} = 600\text{V}$, $I_C = 15.0\text{A}$, $V_{GE} = 0.0/15.0\text{V}$, $R_{G(on)} = 22.0\Omega$, $R_{G(off)} = 22.0\Omega$, $L\sigma = 95\text{nH}$, $C\sigma = 67\text{pF}$ $L\sigma$, $C\sigma$ from Fig. E Energy losses include "tail" and diode reverse recovery.	-	18	-	ns
Rise time	t_r		-	29	-	ns
Turn-off delay time	$t_{d(off)}$		-	240	-	ns
Fall time	t_f		-	25	-	ns
Turn-on energy	E_{on}		-	0.70	-	mJ
Turn-off energy	E_{off}		-	0.55	-	mJ
Total switching energy	E_{ts}		-	1.25	-	mJ