

ELECTRICAL CHARACTERISTICS ($T_j = 25\text{ }^\circ\text{C}$)

Symbol	Item	Conditions	Min.	Typ.	Max.	Units	
I_{CES}	Collector cutoff current	$V_{CE}=V_{CES}, V_{GE}=0V$	—	—	1	mA	
$V_{GE(th)}$	Gate-emitter threshold voltage	$I_C=60mA, V_{CE}=10V$	5	6	7.5	V	A
I_{GES}	Gate leakage current	$V_{GE}=V_{GES}, V_{CE}=0V$	—	—	0.5	μA	
$V_{CE(sat)}$	Collector to emitter saturation voltage	$T_j=25\text{ }^\circ\text{C}$ $I_C=600A$	—	1.7	2.2	V	
		$T_j=125\text{ }^\circ\text{C}$ $V_{GE}=15V$	—	1.7	—		
C_{ies}	Input capacitance	$V_{CE}=10V$ $V_{GE}=0V$	—	—	90	nF	
C_{oes}	Output capacitance		—	—	11		
C_{res}	Reverse transfer capacitance		—	—	3.6		
Q_G	Total gate charge	$V_{CC}=300V, I_C=600A, V_{GE}=15V$	—	2400	—	nC	
$t_{d(on)}$	Turn-on delay time	$V_{CC}=300V, I_C=600A$ $V_{GE1}=V_{GE2}=15V$ $R_G=4.2\Omega$, Inductive load switching operation	—	—	500	ns	A
t_r	Turn-on rise time		—	—	300		
$t_{d(off)}$	Turn-off delay time		—	—	750		A
t_f	Turn-off fall time		—	—	300		
t_{rr} ①	Reverse recovery time		$I_E=600A$	—	—		250
Q_{rr} ①	Reverse recovery charge		—	8.7	—	μC	A
V_{EC} ①	Emitter-collector voltage	$I_E=600A, V_{GE}=0V$	—	—	2.6	V	
$R_{th(j-c)Q}$	Thermal resistance*	IGBT part (1/2 module)	—	—	0.11	$^\circ\text{C/W}$	A
$R_{th(j-c)R}$		FWDi part(1/2 module)	—	—	0.18		
$R_{th(c-f)}$	Contact thermal resistance	Case to fin, Thermal compound Applied (1/2module) *2	—	0.02	—		
$R_{th(j-c')Q}$	Thermal resistance	Tc measured point is just under the chips	—	—	0.046^{*3}		
R_G	External gate resistance		1.0	—	10	Ω	A

*1: Tc measured point is shown in page OUTLINE DRAWING.

*2: Typical value is measured by using Shin-etsu Silicone "G-746".

*3: If you use this value, $R_{th(f-a)}$ should be measured just under the chips.

- ① $I_E, V_{EC}, t_{rr}, Q_{rr}$ & di/dt represent characteristics of the anti-parallel, emitter to collector free-wheel diode (FWDi).
- ② Pulse width and repetition rate should be such that the device junction temp. (T_j) dose not exceed T_{jmax} rating.
- ③ Junction temperature (T_j) should not increase beyond 150°C .
- ④ Pulse width and repetition rate should be such as to cause negligible temperature rise.

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