

Dynamic Characteristic

Input capacitance	C_{iss}	$V_{CE}=25V,$	-	1100	-	pF
Output capacitance	C_{oss}	$V_{GE}=0V,$	-	100	-	
Reverse transfer capacitance	C_{rss}	$f=1MHz$	-	50	-	
Gate charge	Q_{Gate}	$V_{CC}=960V, I_C=15A$ $V_{GE}=15V$	-	85	-	nC
Internal emitter inductance measured 5mm (0.197 in.) from case	L_E		-	13	-	nH
Short circuit collector current ¹⁾	$I_{C(SC)}$	$V_{GE}=15V, t_{SC} \leq 10\mu s$ $V_{CC} = 600V,$ $T_j = 25^\circ C$	-	90	-	A

Switching Characteristic, Inductive Load, at $T_j=25^\circ C$

Parameter	Symbol	Conditions	Value			Unit
			min.	typ.	max.	

IGBT Characteristic

Turn-on delay time	$t_{d(on)}$	$T_j=25^\circ C,$ $V_{CC}=600V, I_C=15A,$ $V_{GE}=0/15V,$ $R_G=56\Omega,$ $L_\sigma^{2)}=180nH,$ $C_\sigma^{2)}=39pF$ Energy losses include "tail" and diode reverse recovery.	-	50	-	ns
Rise time	t_r		-	30	-	
Turn-off delay time	$t_{d(off)}$		-	520	-	
Fall time	t_f		-	60	-	mJ
Turn-on energy	E_{on}		-	1.3	-	
Turn-off energy	E_{off}		-	1.4	-	
Total switching energy	E_{ts}		-	2.7	-	

Anti-Parallel Diode Characteristic

Diode reverse recovery time	t_{rr}	$T_j=25^\circ C,$	-	140	-	ns
Diode reverse recovery charge	Q_{rr}	$V_R=600V, I_F=15A,$	-	1.9	-	μC
Diode peak reverse recovery current	I_{rrm}	$di_F/dt=600A/\mu s$	-	17	-	A
Diode peak rate of fall of reverse recovery current during t_b	di_{rr}/dt		-	230	-	$A/\mu s$

¹⁾ Allowed number of short circuits: <1000; time between short circuits: >1s.

²⁾ Leakage inductance L_σ and Stray capacity C_σ due to dynamic test circuit in Figure E.

Switching Characteristic, Inductive Load, at $T_j=150^\circ\text{C}$

Parameter	Symbol	Conditions	Value			Unit
			min.	typ.	max.	
IGBT Characteristic						
Turn-on delay time	$t_{d(\text{on})}$	$T_j=150^\circ\text{C}$, $V_{\text{CC}}=600\text{V}$, $I_{\text{C}}=15\text{A}$, $V_{\text{GE}}=0/15\text{V}$, $R_{\text{G}}=56\Omega$ $L_{\sigma}^{1)}=180\text{nH}$, $C_{\sigma}^{1)}=39\text{pF}$ Energy losses include "tail" and diode reverse recovery.	-	50	-	ns
Rise time	t_{r}		-	35	-	
Turn-off delay time	$t_{d(\text{off})}$		-	600	-	
Fall time	t_{f}		-	120	-	
Turn-on energy	E_{on}		-	2.0	-	mJ
Turn-off energy	E_{off}		-	2.1	-	
Total switching energy	E_{ts}		-	4.1	-	
Anti-Parallel Diode Characteristic						
Diode reverse recovery time	t_{rr}	$T_j=150^\circ\text{C}$ $V_{\text{R}}=600\text{V}$, $I_{\text{F}}=15\text{A}$, $di_{\text{F}}/dt=600\text{A}/\mu\text{s}$	-	330	-	ns
Diode reverse recovery charge	Q_{rr}		-	3.4	-	μC
Diode peak reverse recovery current	I_{rrm}		-	21	-	A
Diode peak rate of fall of reverse recovery current during t_{b}	di_{rr}/dt		-	190	-	$\text{A}/\mu\text{s}$

¹⁾ Leakage inductance L_{σ} and Stray capacity C_{σ} due to dynamic test circuit in Figure E.