

Dynamic Characteristic

Input capacitance	C_{iss}	$V_{CE}=25V,$ $V_{GE}=0V,$ $f=1\text{ MHz}$	-	2360	-	pF
Output capacitance	C_{oss}		-	230	-	
Reverse transfer capacitance	C_{rss}		-	125	-	
Gate charge	Q_{Gate}	$V_{CC}=960V, I_C=40A$ $V_{GE}=15V$	-	192	-	nC
Internal emitter inductance measured 5mm (0.197 in.) from case	L_E		-	13	-	nH
Short circuit collector current ¹⁾	$I_{C(SC)}$	$V_{GE}=15V, t_{SC}\leq 10\mu s$ $V_{CC} = 600V,$ $T_{j,start} = 25^\circ C$ $T_{j,start} = 175^\circ C$	-	220 156	-	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	$t_{d(on)}$	$T_j=25^\circ C,$ $V_{CC}=600V, I_C=40A,$ $V_{GE}=0/15V,$ $R_G=12\Omega,$ $L_{\sigma}^{(2)}=80nH,$ $C_{\sigma}^{(2)}=67pF$ Energy losses include "tail" and diode reverse recovery.	-	33	-	ns
Rise time	t_r		-	28	-	
Turn-off delay time	$t_{d(off)}$		-	314	-	
Fall time	t_f		-	94	-	
Turn-on energy	E_{on}		-	3.2	-	mJ
Turn-off energy	E_{off}		-	2.05	-	
Total switching energy	E_{ts}		-	5.25	-	
Anti-Parallel Diode Characteristic						
Diode reverse recovery time	t_{rr}	$T_j=25^\circ C,$	-	285	-	ns
Diode reverse recovery charge	Q_{rr}	$V_R=600V, I_F=40A,$ $di_F/dt=950A/\mu s$	-	3.3	-	μC
Diode peak reverse recovery current	I_{rrm}		-	23	-	A
Diode peak rate of fall of reverse recovery current during t_b	di_{rr}/dt		-	350	-	$A/\mu s$

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 $T_j=175^\circ\text{C}$

Parameter	Symbol	Conditions	Value			Unit
			min.	typ.	max.	
IGBT Characteristic						
Turn-on delay time	$t_{d(\text{on})}$	$T_j=175^\circ\text{C}$ $V_{\text{CC}}=600\text{V}, I_{\text{C}}=40\text{A},$ $V_{\text{GE}}=0/15\text{V},$ $R_{\text{G}}=12\Omega,$ $L_{\sigma}^{1)}=180\text{nH},$ $C_{\sigma}^{1)}=67\text{pF}$ Energy losses include "tail" and diode reverse recovery.	-	32	-	ns
Rise time	t_r		-	28	-	
Turn-off delay time	$t_{d(\text{off})}$		-	405	-	
Fall time	t_f		-	195	-	
Turn-on energy	E_{on}		-	4.5	-	mJ
Turn-off energy	E_{off}		-	3.8	-	
Total switching energy	E_{ts}		-	8.3	-	
Anti-Parallel Diode Characteristic						
Diode reverse recovery time	t_{rr}	$T_j=175^\circ\text{C}$ $V_{\text{R}}=600\text{V}, I_{\text{F}}=40\text{A},$ $di_{\text{F}}/dt=950\text{A}/\mu\text{s}$	-	480	-	ns
Diode reverse recovery charge	Q_{rr}		-	6.6	-	μC
Diode peak reverse recovery current	I_{rrm}		-	31	-	A
Diode peak rate of fall of reverse recovery current during t_b	di_{rr}/dt		-	200		$\text{A}/\mu\text{s}$

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