



SWITCHING CHARACTERISTICS ($T_J = 25\text{ }^\circ\text{C}$ unless otherwise specified)						
PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNITS
Total gate charge (turn-on)	Q_G	$I_C = 10\text{ A}$ $V_{CC} = 600\text{ V}$ $V_{GE} = 15\text{ V}$	-	48	75	nC
Gate to emitter charge (turn-on)	Q_{GE}		-	8	15	
Gate to collector charge (turn-on)	Q_{GC}		-	22	33	
Turn-on switching loss	E_{ON}	$I_C = 10\text{ A}, V_{CC} = 600\text{ V}$ $V_{GE} = 15\text{ V}, R_G = 22\text{ }\Omega, L = 1\text{ mH}$ $T_J = 25\text{ }^\circ\text{C}$ ⁽¹⁾	-	0.84	1.26	mJ
Turn-off switching loss	E_{OFF}		-	0.36	0.54	
Total switching loss	E_{TOT}		-	1.20	1.81	
Turn-on switching loss	E_{ON}	$I_C = 10\text{ A}, V_{CC} = 600\text{ V}$ $V_{GE} = 15\text{ V}, R_G = 22\text{ }\Omega, L = 1\text{ mH}$ $T_J = 125\text{ }^\circ\text{C}$ ⁽¹⁾	-	1.14	1.71	
Turn-off switching loss	E_{OFF}		-	0.64	0.96	
Total switching loss	E_{TOT}		-	1.78	2.67	
Turn-on delay time	$t_{d(ON)}$	$I_C = 10\text{ A}, V_{CC} = 600\text{ V}$ $V_{GE} = 15\text{ V}, R_G = 22\text{ }\Omega, L = 1\text{ mH}$ $T_J = 125\text{ }^\circ\text{C}$	-	83	124	ns
Rise time	t_r		-	21	32	
Turn-off delay time	$t_{d(OFF)}$		-	115	172	
Fall time	t_f		-	279	420	
Input capacitance	C_{ies}	$V_{GE} = 0\text{ V}$ $V_{CC} = 30\text{ V}$ $f = 1\text{ MHz}$	-	750	1150	pF
Output capacitance	C_{oes}		-	190	290	
Reverse transfer capacitance	C_{res}		-	20	35	
Reverse bias safe operating area	RBSOA	$T_J = 150\text{ }^\circ\text{C}, I_C = 40\text{ A}$ $R_G = 22\text{ }\Omega, V_{GE} = 15\text{ V to }0\text{ V}$	Fullsquare			
Short circuit safe operating area	SCSOA	$T_J = 150\text{ }^\circ\text{C}$ $V_{CC} = 960\text{ V}, V_P = 1200\text{ V}$ $R_G = 22\text{ }\Omega, V_{GE} = 15\text{ V to }0\text{ V}$	10	-	-	μs
Diode peak reverse recovery current	I_{rr}	$T_J = 125\text{ }^\circ\text{C}$ $V_{CC} = 600\text{ V}, I_F = 10\text{ A}, L = 1\text{ mH}$ $V_{GE} = 15\text{ V}, R_G = 22\text{ }\Omega$	-	22	-	A

Note
⁽¹⁾ Energy losses include "tail" and diode reverse recovery

INVERTER

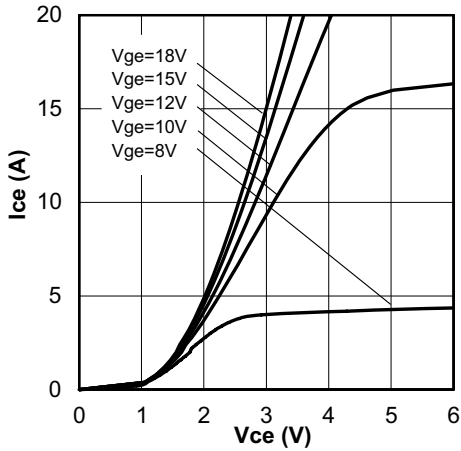


Fig. 1 - Typical IGBT Output Characteristics
 $T_J = 25\text{ }^\circ\text{C}$; $t_p = 80\text{ }\mu\text{s}$

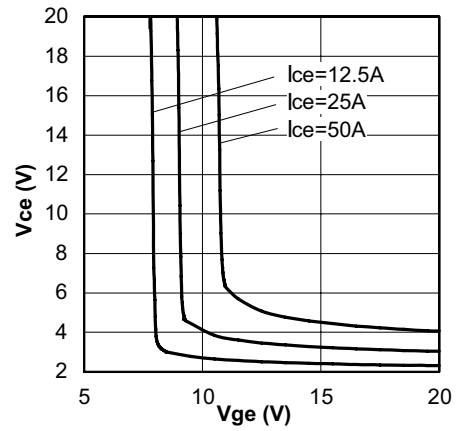


Fig. 4 - Typical V_{CE} vs. V_{GE}
 $T_J = 125\text{ }^\circ\text{C}$

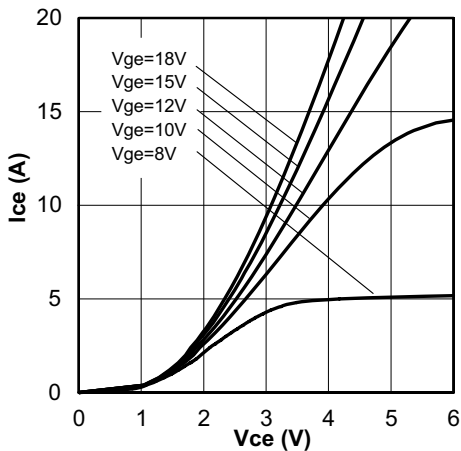


Fig. 2 - Typical IGBT Output Characteristics
 $T_J = 125\text{ }^\circ\text{C}$; $t_p = 80\text{ }\mu\text{s}$

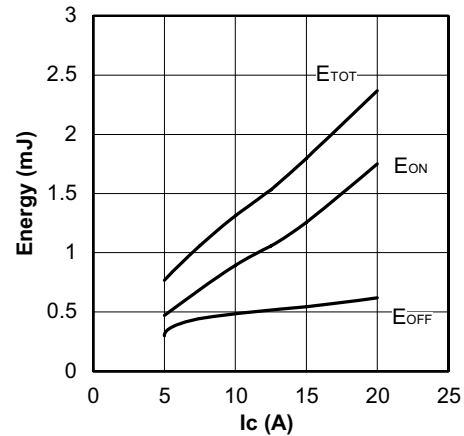


Fig. 5 - Typical Energy Loss vs. I_C
 $T_J = 125\text{ }^\circ\text{C}$; $L = 1\text{ mH}$; $V_{CE} = 600\text{ V}$
 $R_G = 22\text{ }\Omega$; $V_{GE} = 15\text{ V}$

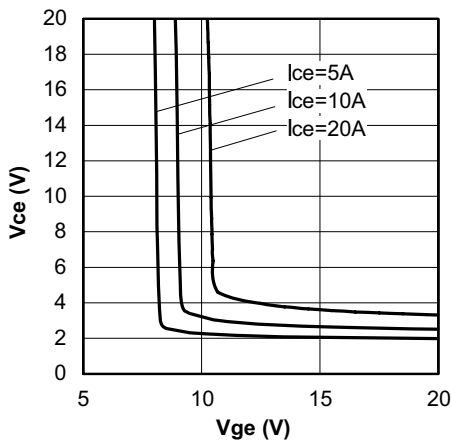


Fig. 3 - Typical V_{CE} vs. V_{GE}
 $T_J = 25\text{ }^\circ\text{C}$

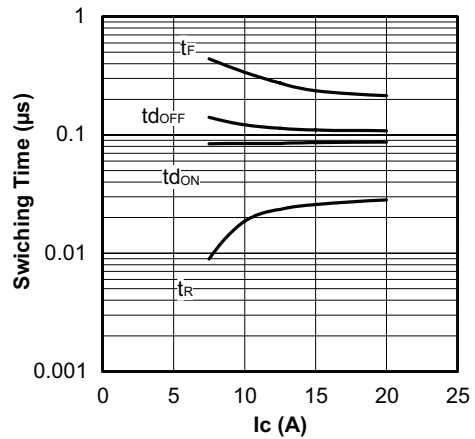


Fig. 6 - Typical Switching Time vs. I_C
 $T_J = 125\text{ }^\circ\text{C}$; $L = 1\text{ mH}$; $V_{CE} = 600\text{ V}$
 $R_G = 22\text{ }\Omega$; $V_{GE} = 15\text{ V}$