TENTATIVE TOSHIBA INSULATED GATE BIPOLAR TRANSISTOR SILICON N CHANNEL IGBT

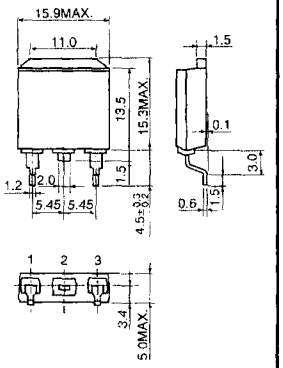
GT10Q311

HIGH POWER SWITCHING APPLICATIONS

MOTOR CONTROL APPLICATIONS

- The 3rd Generation
- Enhancement-Mode
- High Speed : $t_f = 0.40\mu s$ (Max.)
- Low Saturation Voltage : $V_{CE\,(sat)} = 3.5V$ (Max.)
- FRD included between Emitter and Collector

Unit in mm



1. GATE
2. COLLECTOR (HEAT SINK)
3. EMITTER

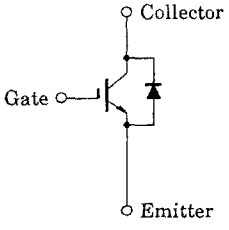
JEDEC	—
EIAJ	—
TOSHIBA	2-16H1A

Weight : 3.65g

MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	RATING	UNIT
Collector-Emitter Voltage		V_{CES}	1200	V
Gate-Emitter Voltage		V_{GES}	±20	V
Collector Current	DC	I_C	10	A
	1ms	I_{CP}	20	A
Emitter-Collector Forward Current	DC	I_F	10	A
	1ms	I_{FM}	20	A
Collector Power Dissipation (Tc = 25°C)		P_C	130	W
Junction Temperature		T_j	150	°C
Storage Temperature Range		T_{stg}	−55~150	°C

EQUIVALENT CIRCUIT



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ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Gate Leakage Current		I_{GES}	$V_{GE} = \pm 20V$, $V_{CE} = 0$	—	—	±500	nA
Collector Cut-Off Current		I_{CES}	$V_{CE} = 1200V$, $V_{GE} = 0$	—	—	1.0	mA
Gate-Emitter Cut-Off Voltage		$V_{GE\ (OFF)}$	$I_C = 1mA$, $V_{CE} = 5V$	5.0	—	8.0	V
Collector-Emitter Saturation Voltage		$V_{CE\ (sat)}$	$I_C = 10A$, $V_{GE} = 15V$	—	2.7	3.5	V
Input Capacitance		C_{ies}	$V_{CE} = 10V$, $V_{GE} = 0$, f = 1MHz	—	1800	—	pF
Switching Time	Rise Time	t_r	Inductive Load	—	0.30	—	μs
	Turn-On Time	t_{on}	$V_{CC} = 600V$, $I_C = 10A$	—	0.40	—	
	Fall Time	t_f	$V_{GE} = \pm 15V$, $R_G = 120\Omega$	—	0.20	0.40	
	Turn-Off Time	t_{off}	(Note)	—	0.70	—	
Peak Forward Voltage		V_F	$I_F = 10A$, $V_{GE} = 0$	—	—	3.0	V
Reverse Recovery Time		t_{rr}	$I_F = 10A$, $di/dt = -100A/\mu s$	—	—	300	ns
Thermal Resistance (IGBT)		$R_{th\ (j-c)}$	—	—	—	0.96	°C/W
Thermal Resistance (Diode)		$R_{th\ (j-c)}$	—	—	—	3.68	°C/W

(Note) Switching time measurement circuit and input/output waveforms