TOSHIBA Insulated Gate Bipolar Transistor Silicon N Channel IGBT

# GT60M322

Voltage Resonance Inverter Switching Application Current Resonance Inverter Switching Application

• Enhancement mode type

• High speed :  $t_f = 0.15 \mu s$  (typ.) (IC = 60 A)

• Low saturation voltage  $: V_{CE (sat)} = 2.3 \text{ V (typ.) (IC} = 60 \text{ A)}$ 

• FRD included between emitter and collector

• TO-3P(LH) (Toshiba package name)

#### Maximum Ratings (Ta = 25°C)

Characteristics		Symbol	Rating	Unit	
Collector-emitter voltage		V <sub>CES</sub>	950	V	
Gate-emitter voltage		V <sub>GES</sub>	±25	V	
Collector current	DC	IC	60	А	
	1ms	I <sub>CP</sub>	120		
Diode forward current	DC	IF	25	А	
	Pulsed	I <sub>FP</sub>	50		
Collector power dissipation	@ Tc = 100°C	D-	76	W	
	@ Tc = 25°C	P <sub>C</sub>	190		
Junction temperature		Tj	150	°C	
Storage temperature range		T <sub>stg</sub>	−55 to 150	°C	

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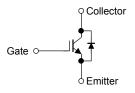
Weight: 9.75 g (typ.)

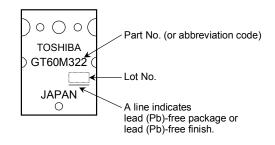
#### **Thermal Characteristics**

Characteristics	Symbol	Max	Unit	
Thermal resistance (IGBT)	R <sub>th (j-c)</sub>	0.66	°C/W	
Thermal resistance (diode)	R <sub>th (j-c)</sub>	1.38	°C/W	

#### **Equivalent Circuit**

### Marking

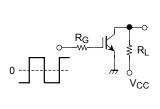


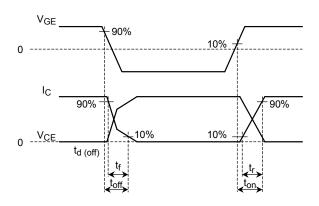


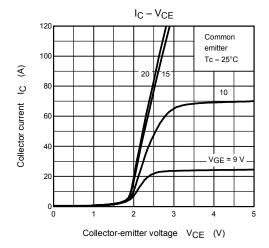
## Electrical Characteristics (Ta = 25°C)

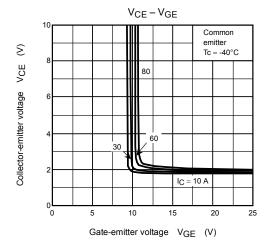
Chara	acteristics	Symbol	Test Condition	Min	Тур.	Max	Unit
Gate leakage cur	rent	I <sub>GES</sub>	V <sub>GE</sub> = ±25 V, V <sub>CE</sub> = 0	_	_	±500	nA
Collector cut-off current		I <sub>CES</sub>	V <sub>CE</sub> = 950 V, V <sub>GE</sub> = 0	_	_	1.0	mA
Gate-emitter cut-	off voltage	V <sub>GE</sub> (OFF)	I <sub>C</sub> = 60 mA, V <sub>CE</sub> = 5 V	6.0	_	9.0	V
Collector-emitter saturation voltage		V <sub>CE (sat)</sub>	I <sub>C</sub> = 60 A, V <sub>GE</sub> = 15 V	_	2.3	2.7	V
Input capacitance		C <sub>ies</sub>	V <sub>CE</sub> = 10 V, V <sub>GE</sub> = 0, f = 1 MHz	_	6800	_	pF
Switching time	Rise time	t <sub>r</sub>	Resistive Load	_	0.42	_	μs
	Turn-on time	t <sub>on</sub>	V <sub>CC</sub> = 600 V, I <sub>C</sub> = 60 A	_	0.62	_	
	Fall time	t <sub>f</sub>	$V_{GG}$ = ±15 V, $R_G$ = 30 $\Omega$	_	0.15	0.21	
	Turn-off time	t <sub>off</sub>	(Note 1)	_	0.39	-	
Diode forward voltage V <sub>F</sub>		V <sub>F</sub>	I <sub>F</sub> = 25 A, V <sub>GE</sub> = 0	_	_	3.0	V
Reverse recovery time t <sub>rr</sub>		t <sub>rr</sub>	I <sub>F</sub> = 25 A, di/dt = -200 A/μs	_	_	0.35	μs

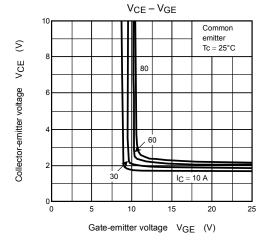
Note 1: Switching time measurement circuit and input/output waveforms

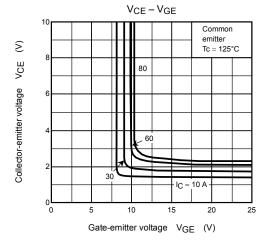


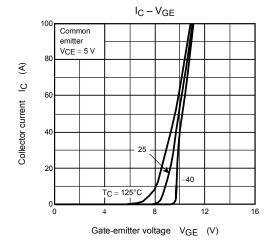


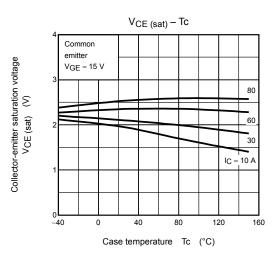


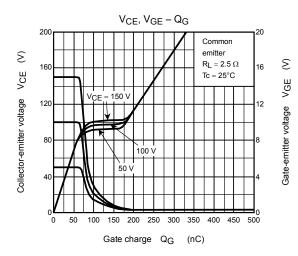


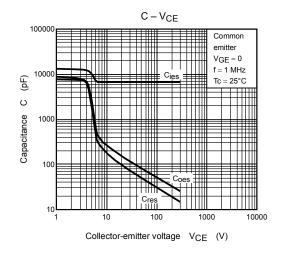


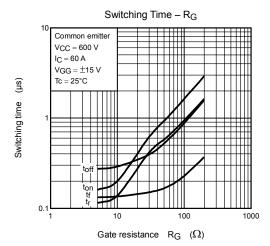


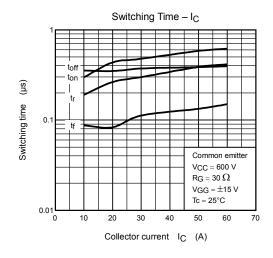


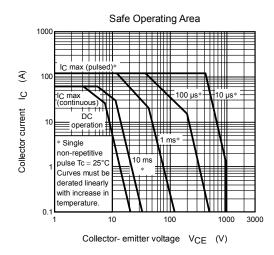


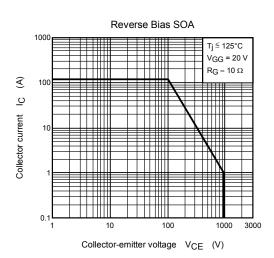


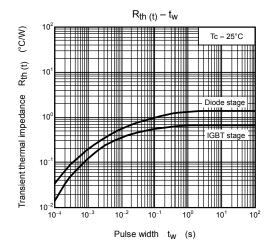


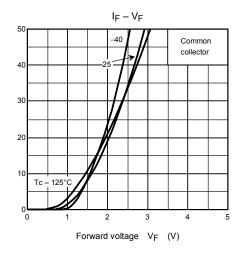


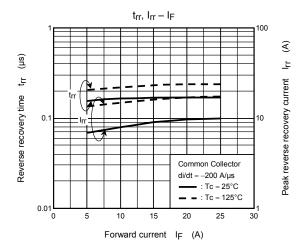












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