

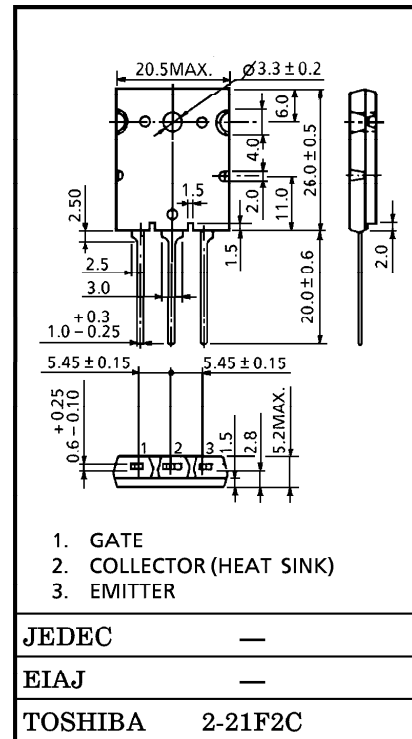
TOSHIBA INSULATED GATE BIPOLAR TRANSISTOR SILICON N CHANNEL MOS TYPE

# GT40M301

HIGH POWER SWITCHING APPLICATIONS

- The 3rd Generation
- FRD Included Between Emitter and Collector
- Enhancement-Mode
- High Speed IGBT :  $t_f = 0.25 \mu s$  (TYP.)  
FRD :  $t_{rr} = 0.7 \mu s$  (TYP.)
- Low Saturation Voltage :  $V_{CE(sat)} = 3.4V$  (MAX.)

Unit in mm

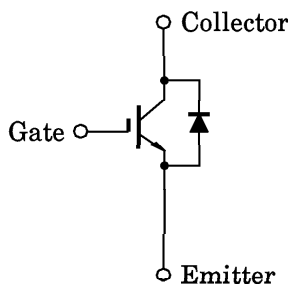


Weight : 9.75g

MAXIMUM RATINGS (Ta = 25°C)

CARACTERISTICS	SYMBOL	RATINGS	UNIT
Collector-Emitter Voltage	$V_{CES}$	900	V
Gate-Emitter Voltage	$V_{GES}$	$\pm 25$	V
Collector Current	DC	$I_C$	40
	1ms	$I_{CP}$	80
Emitter-Collector Forward Current	DC	$I_{ECF}$	15
	1ms	$I_{ECFP}$	120
Collector Power Dissipation (Tc = 25°C)	$P_C$	200	W
Junction Temperature	$T_j$	150	°C
Storage Temperature Range	$T_{stg}$	-55~150	°C
Screw Torque	—	0.8	N·m

EQUIVALENT CIRCUIT



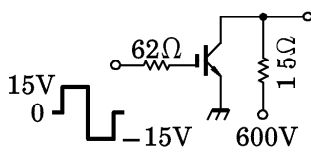
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ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Gate Leakage Current		$I_{GES}$	$V_{GE} = \pm 25V, V_{CE} = 0$	—	—	$\pm 500$	nA
Collector Cut-off Current		$I_{CES}$	$V_{CE} = 900V, V_{GE} = 0$	—	—	1.0	mA
Gate-Emitter Cut-off Voltage		$V_{GE(OFF)}$	$I_C = 40mA, V_{CE} = 5V$	3.0	—	6.0	V
Collector-Emitter Saturation Voltage		$V_{CE(sat)}(1)$	$I_C = 8A, V_{GE} = 15V$	—	1.7	2.4	V
Collector-Emitter Saturation Voltage		$V_{CE(sat)}(2)$	$I_C = 40A, V_{GE} = 15V$	—	2.1	3.4	V
Input Capacitance		$C_{ies}$	$V_{CE} = 30V, V_{GE} = 0$ $f = 1MHz$	—	2100	—	pF
Switching Time	Rise Time	$t_r$		—	0.30	0.60	$\mu s$
	Turn-on Time	$t_{on}$		—	0.40	0.70	
	Fall Time	$t_f$		—	0.25	0.40	
	Turn-off Time	$t_{off}$		—	0.60	1.00	
Emitter-Collector Forward Voltage		$V_{ECF}$	$I_{EC} = 15A, V_{GE} = 0$	—	1.5	2.0	V
Reverse Recovery Time		$t_{rr}$	$I_F = 15A, V_{GE} = 0,$ $di/dt = -20A/\mu s$	—	0.7	2.5	$\mu s$
Thermal Resistance		$R_{th(j-c)}$	IGBT	—	—	0.625	$^{\circ}C/W$
Thermal Resistance		$R_{th(j-c)}$	Diode	—	—	4.0	$^{\circ}C/W$

