

TOSHIBA INSULATED GATE BIPOLAR TRANSISTOR SILICON N CHANNEL IGBT

GT15Q301

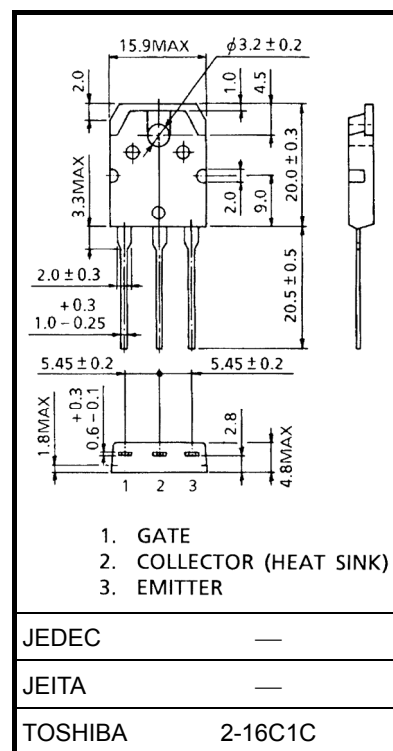
HIGH POWER SWITCHING APPLICATIONS
MOTOR CONTROL APPLICATIONS

Unit: mm

- Third-generation IGBT
- Enhancement mode type
- High speed : $t_f = 0.32 \mu s$ (Max.)
- Low saturation voltage : $V_{CE(sat)} = 2.7 V$ (Max.)
- FRD included between emitter and collector

ABSOLUTE MAXIMUM RATINGS ($T_a = 25^\circ C$)

CHARACTERISTIC		SYMBOL	RATING	UNIT
Collector-Emitter Voltage		V_{CES}	1200	V
Gate-Emitter Voltage		V_{GES}	± 20	V
Collector Current	DC	I_C	15	A
	1ms	I_{CP}	30	A
Emitter-Collector Forward Current	DC	I_F	15	A
	1ms	I_{FM}	30	A
Collector Power Dissipation ($T_c = 25^\circ C$)		P_C	170	W
Junction Temperature		T_J	150	$^\circ C$
Storage Temperature Range		T_{stg}	$-55 \sim 150$	$^\circ C$

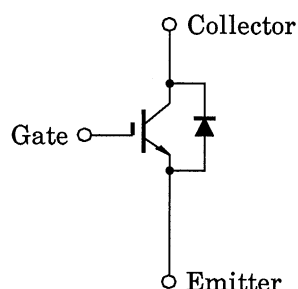


Weight: 4.6 g (typ.)

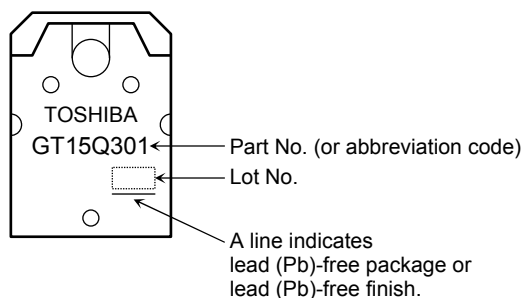
Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.) are within the absolute maximum ratings.

Please design the appropriate reliability upon reviewing the Toshiba Semiconductor Reliability Handbook ("Handling Precautions"/Derating Concept and Methods) and individual reliability data (i.e. reliability test report and estimated failure rate, etc).

EQUIVALENT CIRCUIT



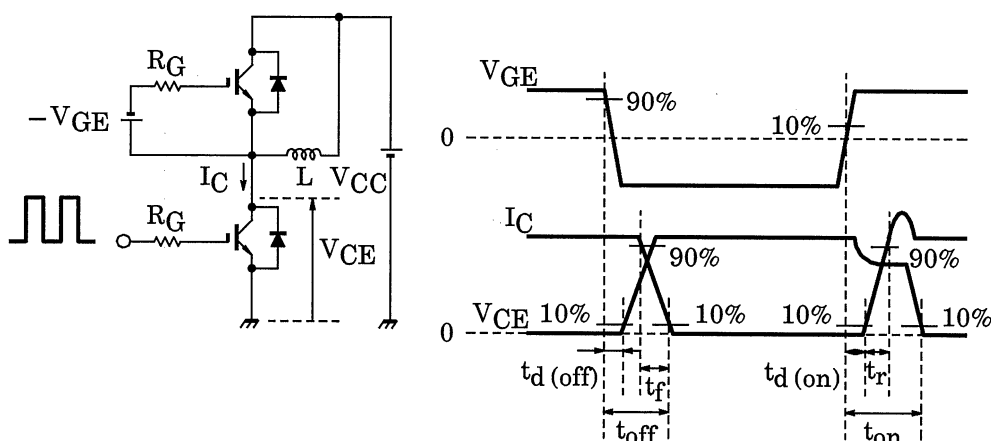
MARKING

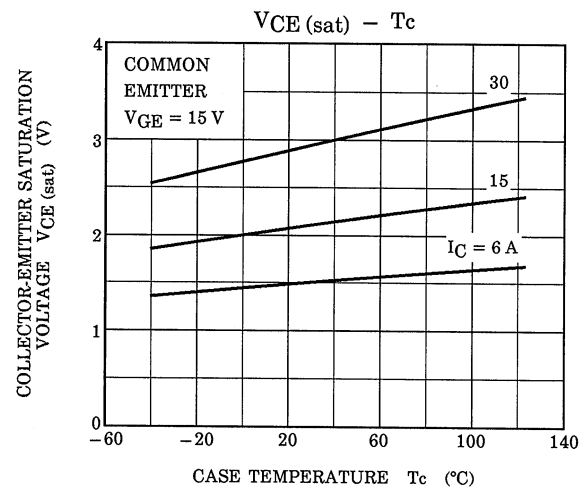
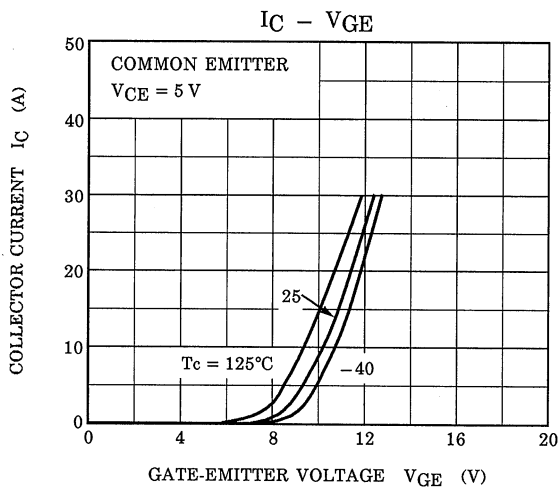
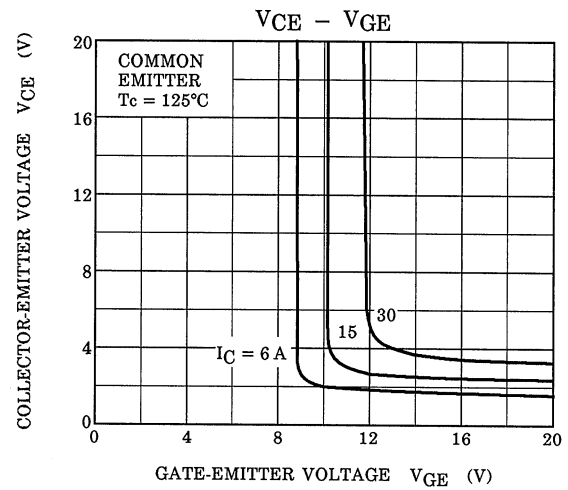
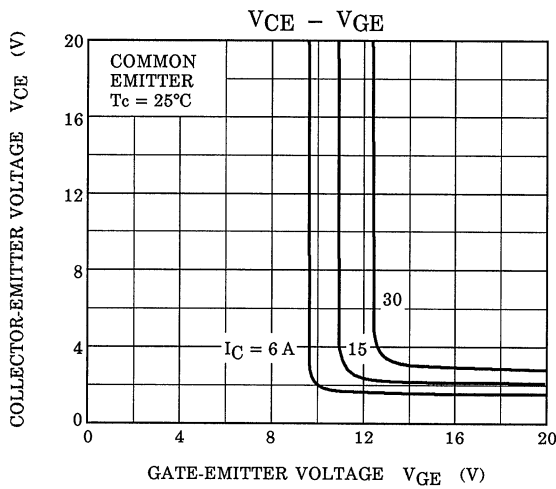
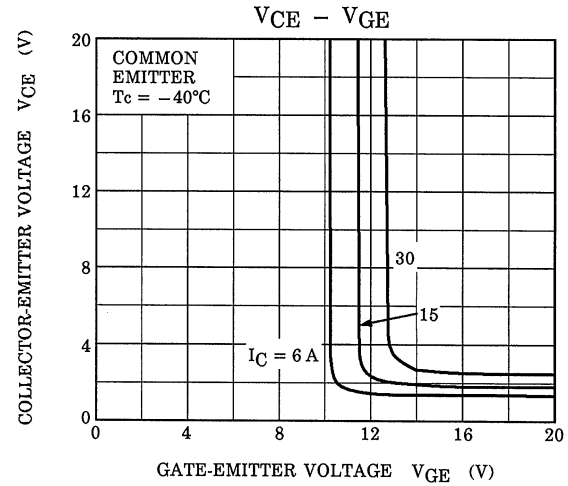
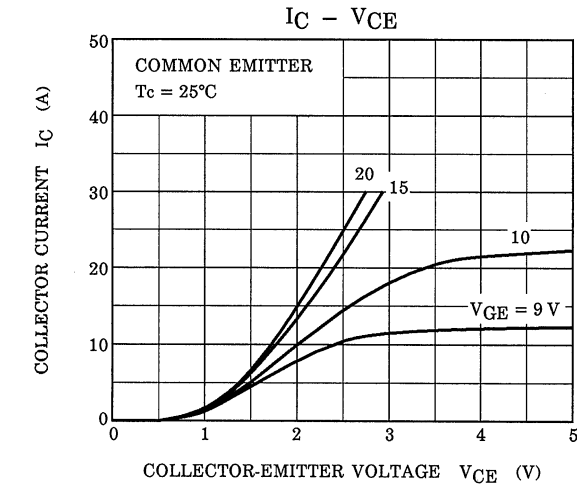


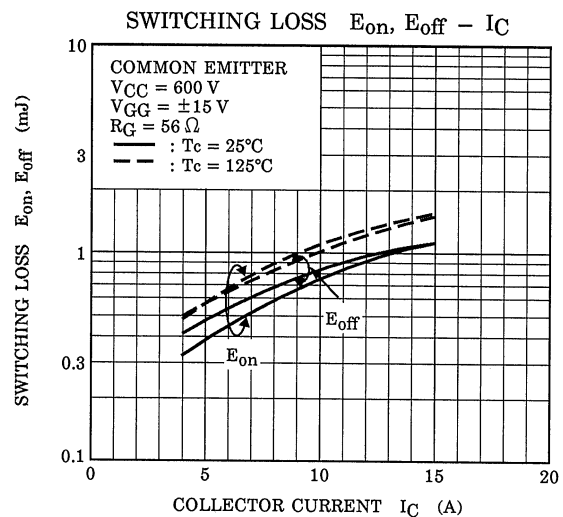
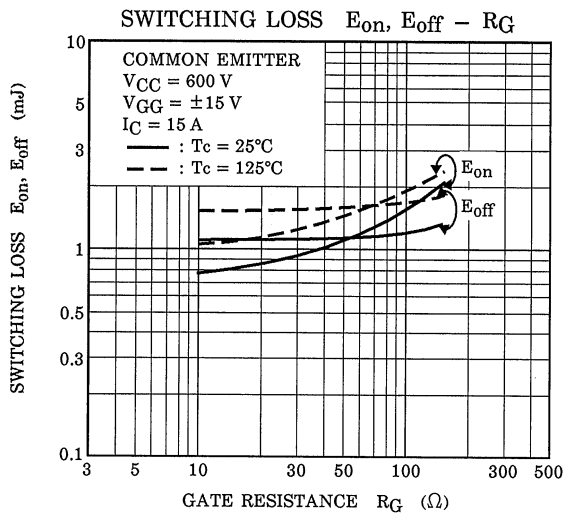
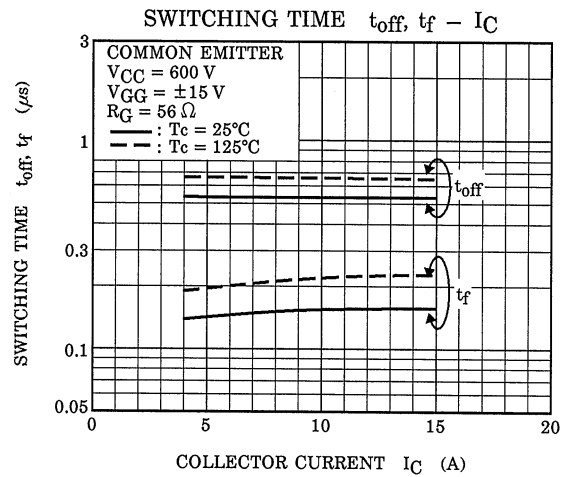
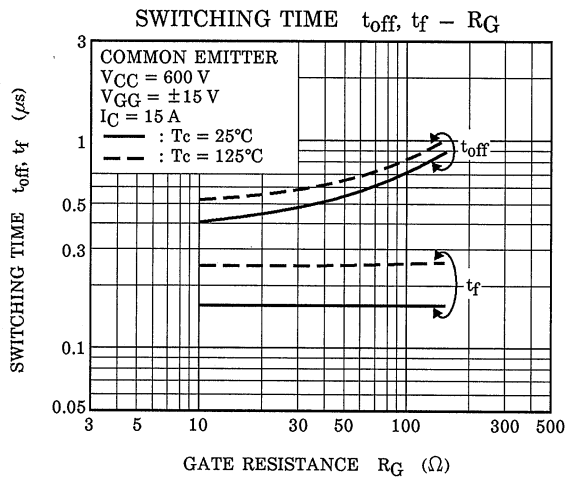
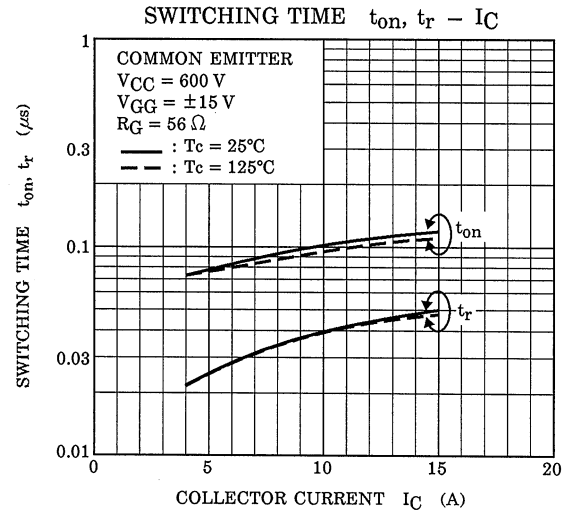
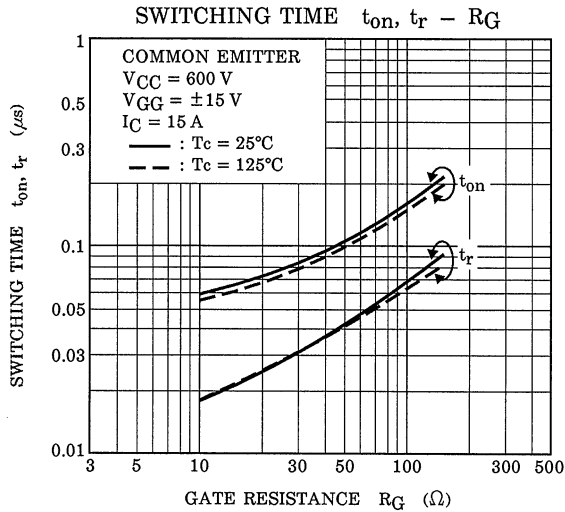
ELECTRICAL CHARACTERISTICS (Ta = 25°C)

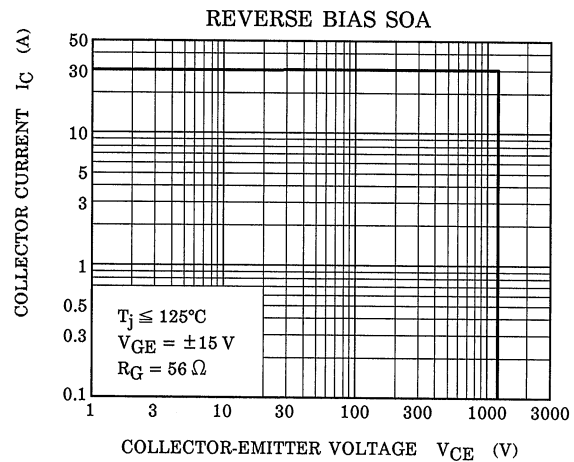
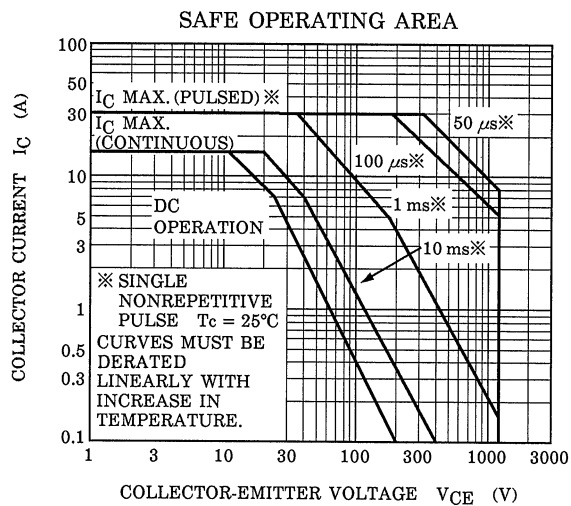
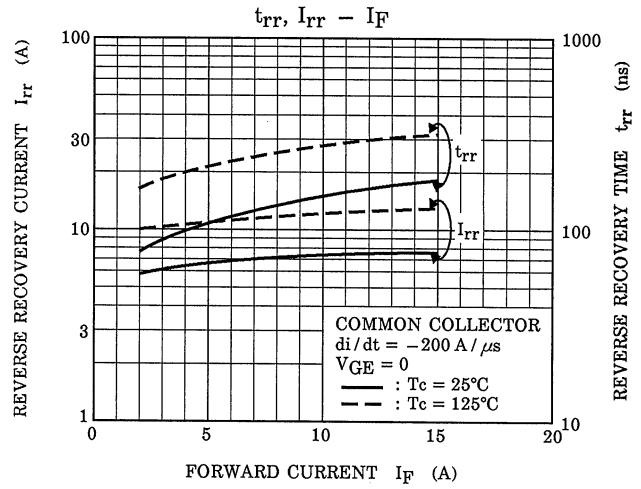
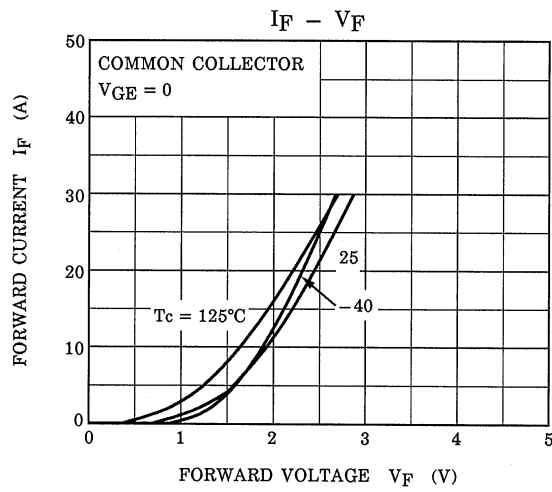
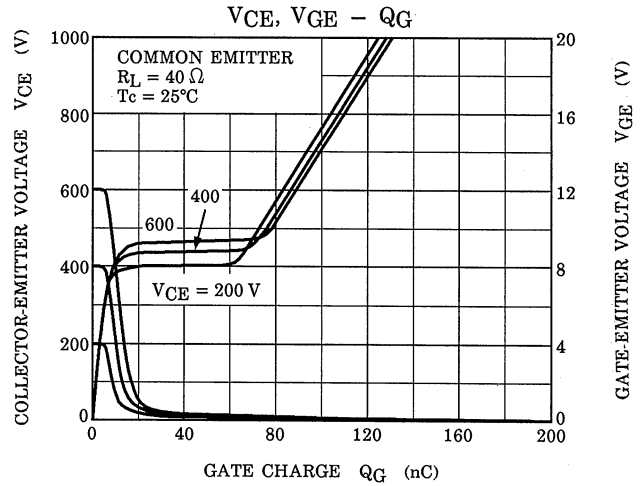
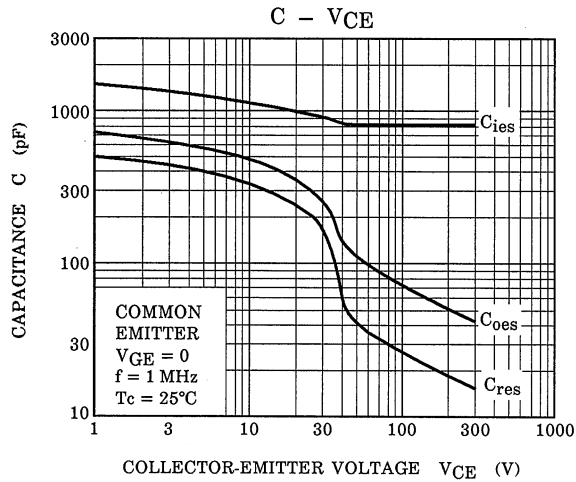
CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN	TYP.	MAX	UNIT
Gate Leakage Current		I_{GES}	$V_{GE} = \pm 20 \text{ V}, V_{CE} = 0$	—	—	± 500	nA
Collector Cut-Off Current		I_{CES}	$V_{CE} = 1200 \text{ V}, V_{GE} = 0$	—	—	1.0	mA
Gate-Emitter Cut-Off Voltage		$V_{GE}(\text{OFF})$	$I_C = 1.5 \text{ mA}, V_{CE} = 5 \text{ V}$	4.0	—	7.0	V
Collector-Emitter Saturation Voltage		$V_{CE}(\text{sat})$	$I_C = 15 \text{ A}, V_{GE} = 15 \text{ V}$	—	2.1	2.7	V
Input Capacitance		C_{ies}	$V_{CE} = 50 \text{ V}, V_{GE} = 0, f = 1 \text{ MHz}$	—	950	—	pF
Switching Time	Rise Time	t_r	Inductive Load $V_{CC} = 600 \text{ V}, I_C = 15 \text{ A}$ $V_{GG} = \pm 15 \text{ V}, R_G = 56 \Omega$ (Note)	—	0.05	—	μs
	Turn-On Time	t_{on}		—	0.12	—	
	Fall Time	t_f		—	0.16	0.40	
	Turn-Off Time	t_{off}		—	0.56	—	
Peak Forward Voltage		V_F	$I_F = 15 \text{ A}, V_{GE} = 0$	—	—	3.0	V
Reverse Recovery Time		t_{rr}	$I_F = 15 \text{ A}, di/dt = -200 \text{ A}/\mu\text{s}$	—	—	350	ns
Thermal Resistance (IGBT)		$R_{th(j-c)}$	—	—	—	0.74	$^{\circ}\text{C}/\text{W}$
Thermal Resistance (Diode)		$R_{th(j-c)}$	—	—	—	1.56	$^{\circ}\text{C}/\text{W}$

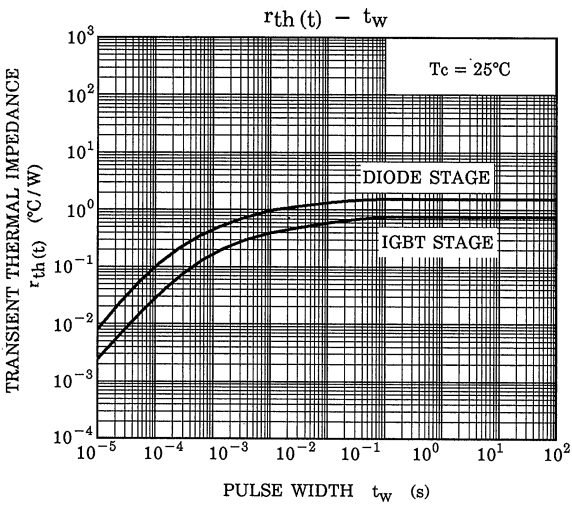
Note : Switching time measurement circuit and input / output waveforms











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