

GT20J321

High Power Switching Applications
Fast Switching Applications

- Fourth-generation IGBT
- Enhancement mode type
- Fast switching (FS): Operating frequency up to 50 kHz (reference)
High speed: $t_f = 0.04 \mu s$ (typ.)
Low switching loss : $E_{on} = 0.40 \text{ mJ}$ (typ.)
 : $E_{off} = 0.43 \text{ mJ}$ (typ.)
- Low saturation voltage: $V_{CE(sat)} = 2.0 \text{ V}$ (typ.)
- FRD included between emitter and collector

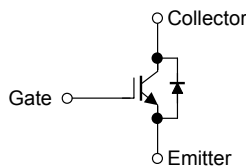
Maximum Ratings (Ta = 25°C)

Characteristics		Symbol	Rating	Unit
Collector-emitter voltage		V_{CES}	600	V
Gate-emitter voltage		V_{GES}	± 20	V
Collector current	DC	I_C	20	A
	1 ms	I_{CP}	40	
Emitter-collector forward current	DC	I_F	20	A
	1 ms	I_{FM}	40	
Collector power dissipation (Tc = 25°C)		P_C	45	W
Junction temperature		T_j	150	°C
Storage temperature range		T_{stg}	-55 to 150	°C

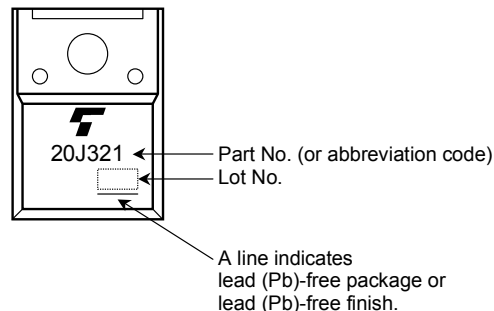
Thermal Characteristics

Characteristics	Symbol	Max	Unit
Thermal resistance (IGBT)	$R_{th(j-c)}$	2.78	°C/W
Thermal resistance (diode)	$R_{th(j-c)}$	4.23	°C/W

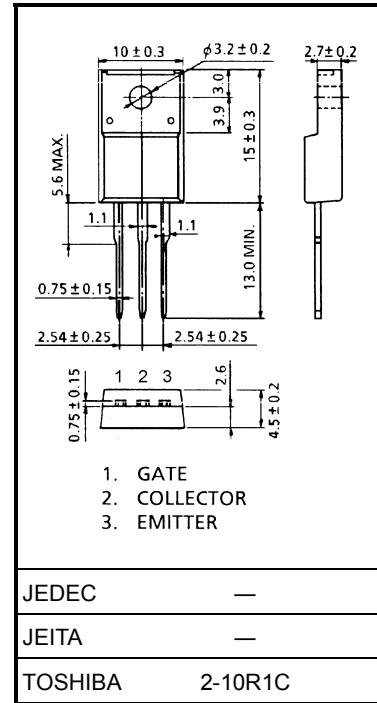
Equivalent Circuit



Marking



Unit: mm

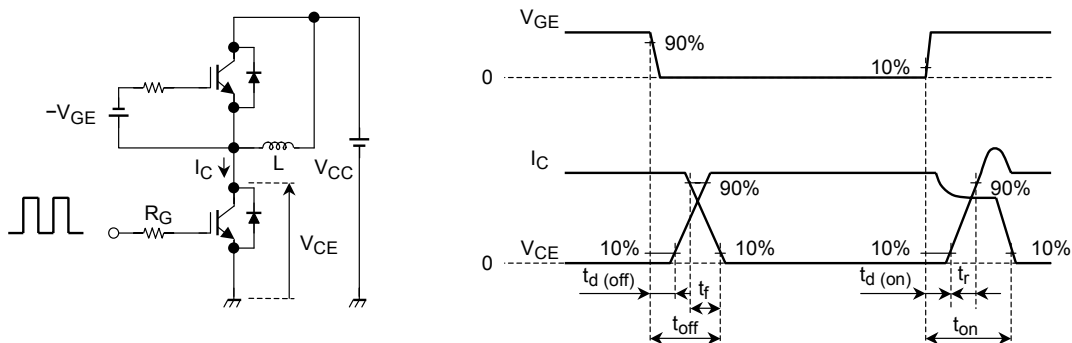


Weight: 1.7 g (typ.)

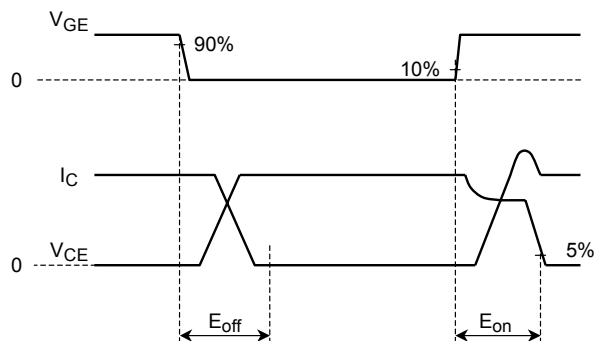
Electrical Characteristics (Ta = 25°C)

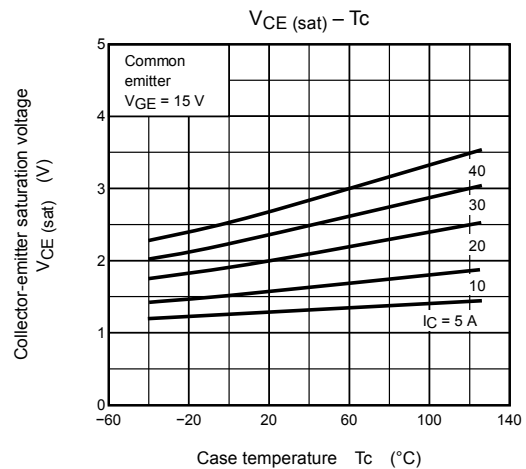
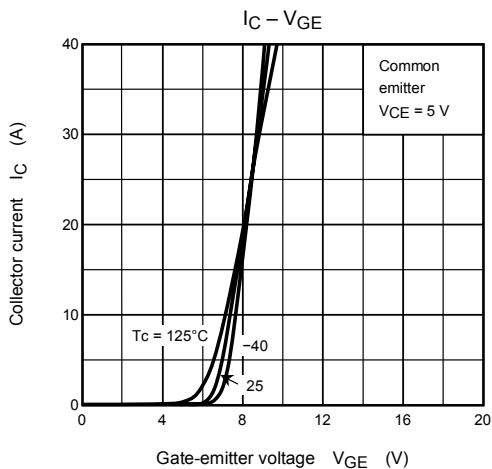
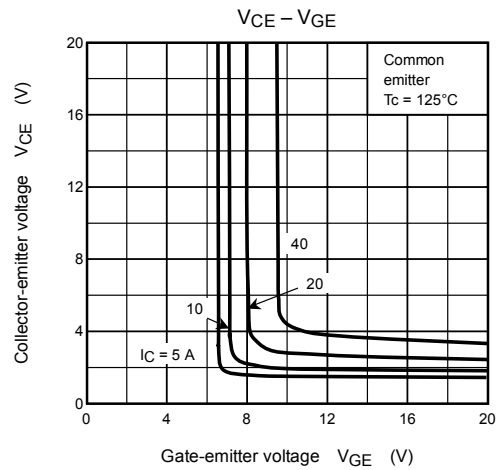
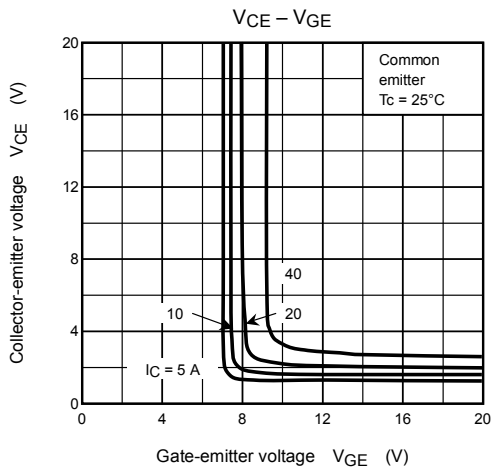
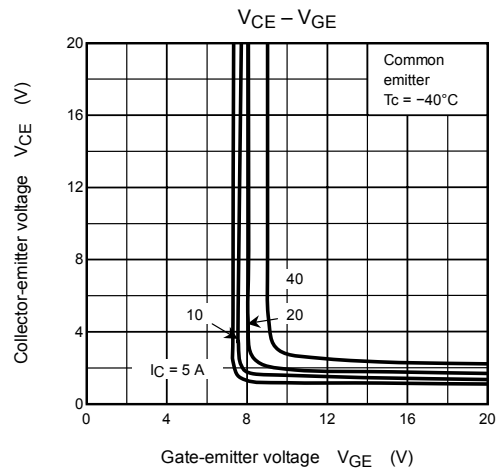
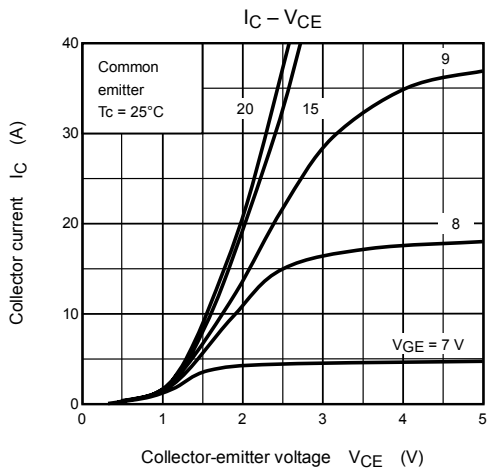
Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit	
Gate leakage current	I_{GES}	$V_{GE} = \pm 20 \text{ V}, V_{CE} = 0$	—	—	± 500	nA	
Collector cut-off current	I_{CES}	$V_{CE} = 600 \text{ V}, V_{GE} = 0$	—	—	1.0	mA	
Gate-emitter cut-off voltage	$V_{GE(OFF)}$	$I_C = 2 \text{ mA}, V_{CE} = 5 \text{ V}$	3.5	—	6.5	V	
Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_C = 20 \text{ A}, V_{GE} = 15 \text{ V}$	—	2.0	2.45	V	
Input capacitance	C_{ies}	$V_{CE} = 10 \text{ V}, V_{GE} = 0, f = 1 \text{ MHz}$	—	3000	—	pF	
Switching time	Turn-on delay time	$t_d(on)$	—	0.06	—	μs	
	Rise time	t_r	—	0.04	—		
	Turn-on time	t_{on}	Inductive Load $V_{CC} = 300 \text{ V}, I_C = 20 \text{ A}$ $V_{GG} = +15 \text{ V}, R_G = 33 \Omega$	—	0.17		—
	Turn-off delay time	$t_d(off)$		—	0.24		—
	Fall time	t_f		—	0.04		—
	Turn-off time	t_{off}		(Note 1)	—		0.34
Switching loss	Turn-on switching loss	E_{on}		—	0.40	—	mJ
	Turn-off switching loss	E_{off}		—	0.43	—	
Peak forward voltage	V_F	$I_F = 20 \text{ A}, V_{GE} = 0$	—	—	2.1	V	
Reverse recovery time	t_{rr}	$I_F = 20 \text{ A}, di/dt = -100 \text{ A}/\mu\text{s}$	—	100	—	ns	

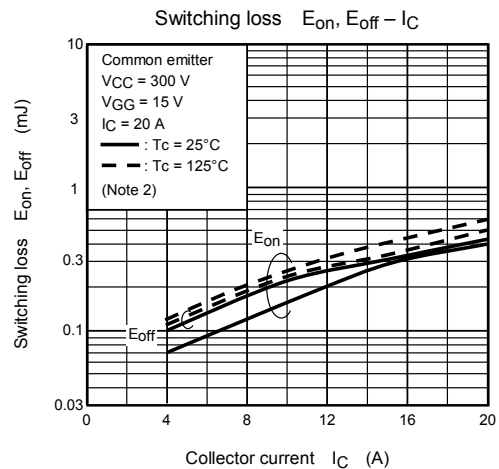
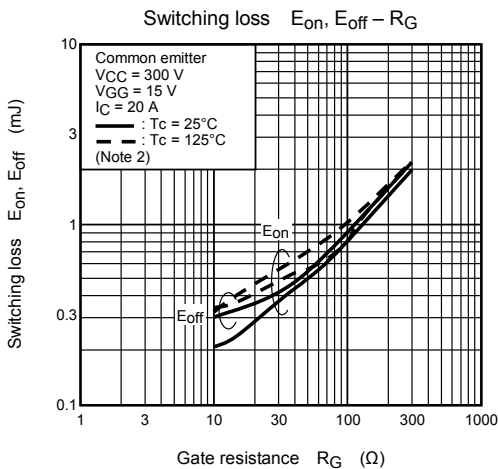
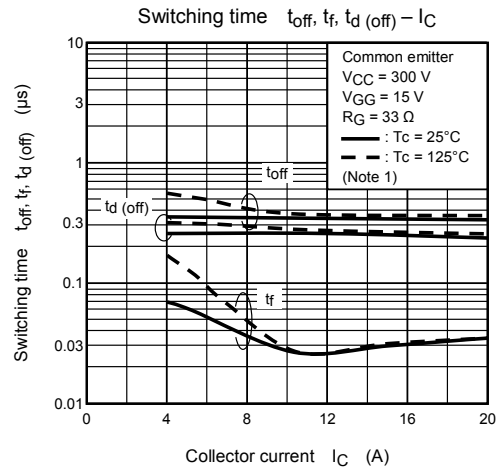
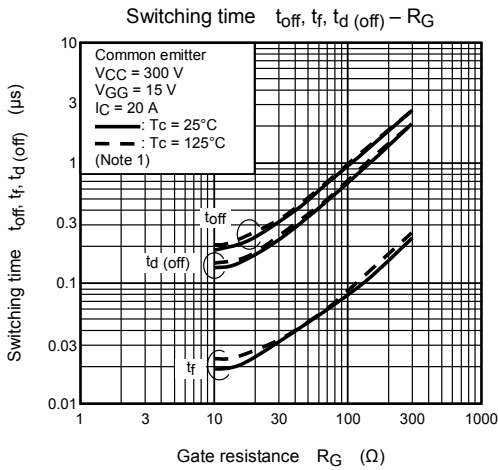
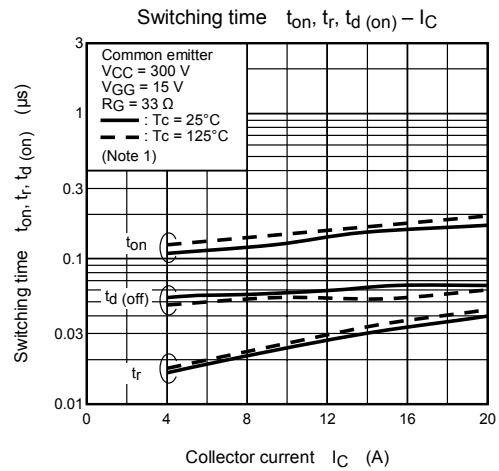
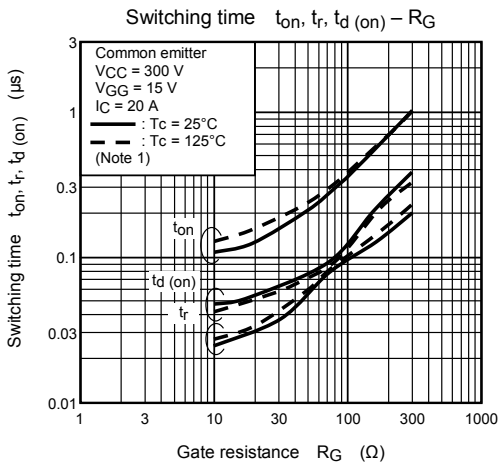
Note 1: Switching time measurement circuit and input/output waveforms

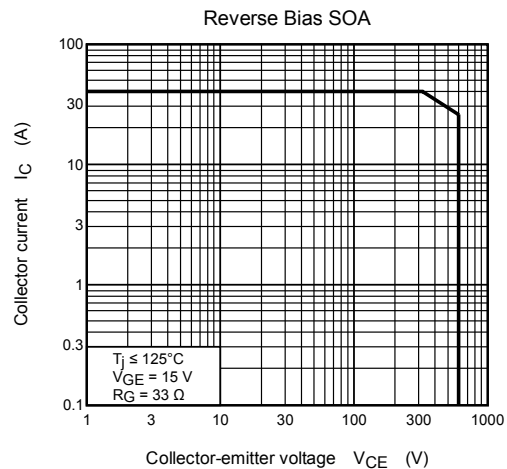
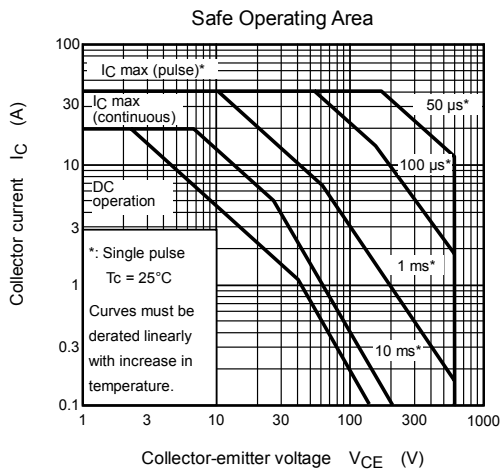
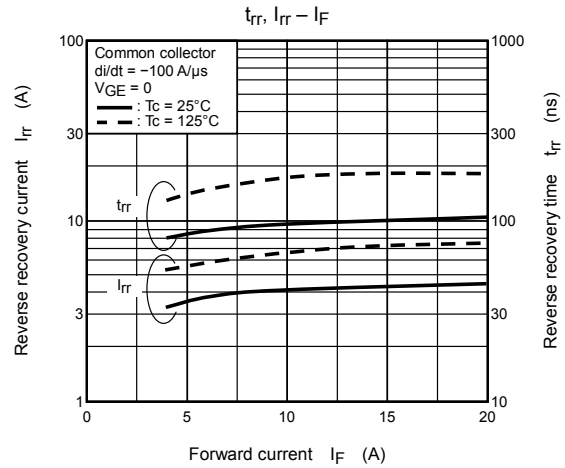
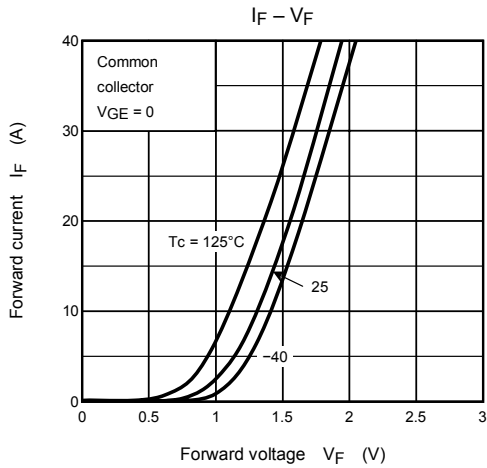
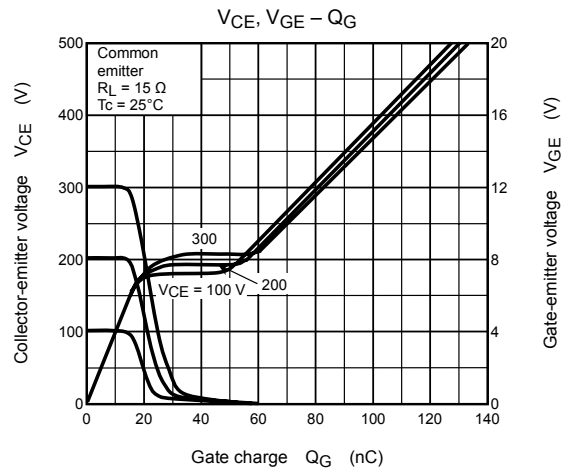
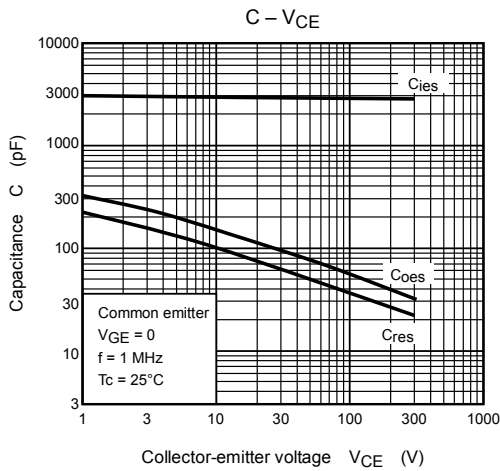


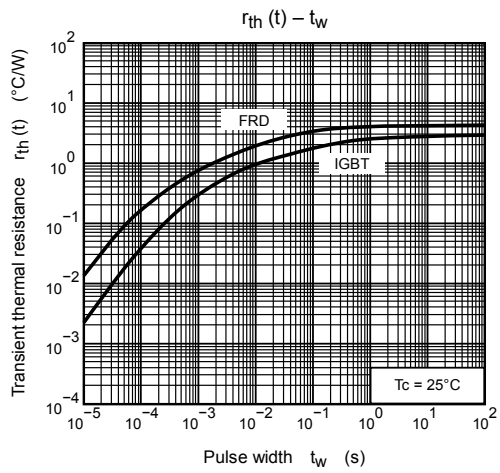
Note 2: Switching loss measurement waveforms











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