

Package Marking and Ordering Information

Device Marking	Device	Package	Reel Size	Tape Width	Quantity
FGL40N120AN	FGL40N120AN	TO-264	-	-	25

Electrical Characteristics of the IGBT T_C = 25°C unless otherwise noted

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Units
Off Characteristics						
BV _{CES}	Collector-Emitter Breakdown Voltage	V _{GE} = 0V, I _C = 1mA	1200	--	--	V
BV _{CES} /ΔT _J	Temperature Coefficient of Breakdown Voltage	V _{GE} = 0V, I _C = 1mA	--	0.6	--	V/°C
I _{CES}	Collector Cut-Off Current	V _{CE} = V _{CES} , V _{GE} = 0V	--	--	1	mA
I _{GES}	G-E Leakage Current	V _{GE} = V _{GES} , V _{CE} = 0V	--	--	±250	nA
On Characteristics						
V _{GE(th)}	G-E Threshold Voltage	I _C = 250μA, V _{CE} = V _{GE}	3.5	5.5	7.5	V
V _{CE(sat)}	Collector to Emitter Saturation Voltage	I _C = 40A, V _{GE} = 15V	--	2.6	3.2	V
		I _C = 40A, V _{GE} = 15V, T _C = 125°C	--	2.9	--	V
		I _C = 64A, V _{GE} = 15V	--	3.15	--	V
Dynamic Characteristics						
C _{ies}	Input Capacitance	V _{CE} = 30V, V _{GE} = 0V f = 1MHz	--	3200	--	pF
C _{oes}	Output Capacitance		--	370	--	pF
C _{res}	Reverse Transfer Capacitance		--	125	--	pF
Switching Characteristics						
t _{d(on)}	Turn-On Delay Time	V _{CC} = 600V, I _C = 40A, R _G = 5Ω, V _{GE} = 15V, Inductive Load, T _C = 25°C	--	15	--	ns
t _r	Rise Time		--	20	--	ns
t _{d(off)}	Turn-Off Delay Time		--	110	--	ns
t _f	Fall Time		--	40	80	ns
E _{on}	Turn-On Switching Loss		--	2.3	3.45	mJ
E _{off}	Turn-Off Switching Loss		--	1.1	1.65	mJ
E _{ts}	Total Switching Loss		--	3.4	5.1	mJ
t _{d(on)}	Turn-On Delay Time	V _{CC} = 600V, I _C = 40A, R _G = 5Ω, V _{GE} = 15V, Inductive Load, T _C = 125°C	--	20	--	ns
t _r	Rise Time		--	25	--	ns
t _{d(off)}	Turn-Off Delay Time		--	120	--	ns
t _f	Fall Time		--	45	--	ns
E _{on}	Turn-On Switching Loss		--	2.5	--	mJ
E _{off}	Turn-Off Switching Loss		--	1.8	--	mJ
E _{ts}	Total Switching Loss		--	4.3	--	mJ
Q _g	Total Gate charge	V _{CE} = 600V, I _C = 40A, V _{GE} = 15V	--	220	330	nC
Q _{ge}	Gate-Emitter Charge		--	25	38	nC
Q _{gc}	Gate-Collector Charge		--	130	195	nC

Typical Performance Characteristics

Figure 1. Typical Output Characteristics

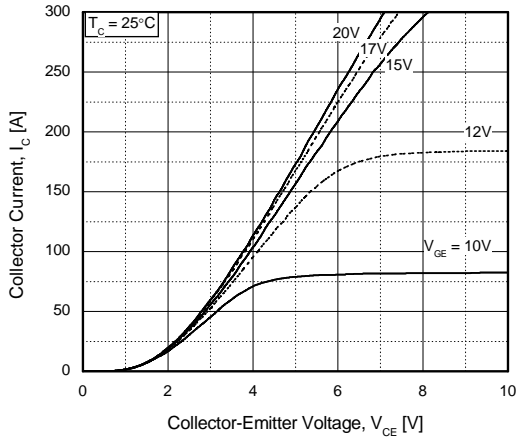


Figure 2. Typical Saturation Voltage Characteristics

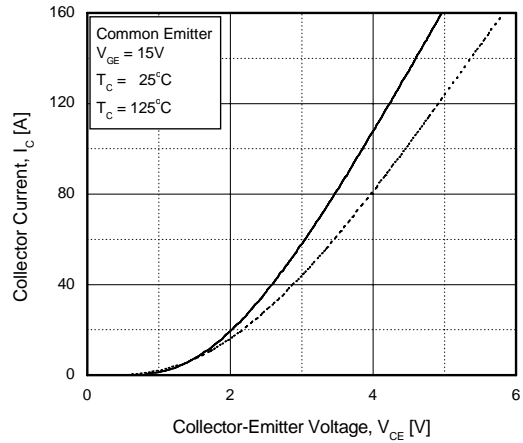


Figure 3. Saturation Voltage vs. Case Temperature at Variant Current Level

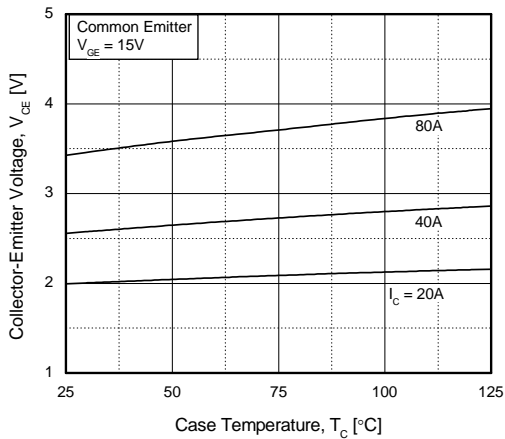


Figure 4. Load Current vs. Frequency

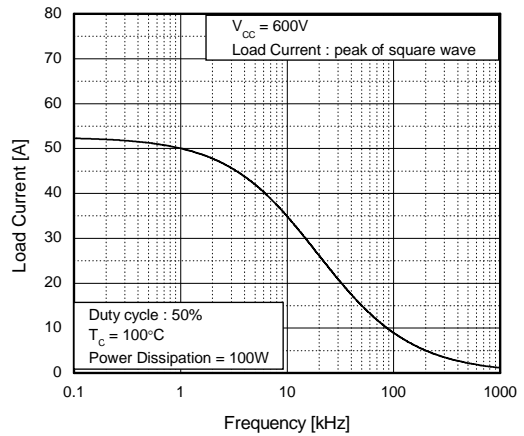


Figure 5. Saturation Voltage vs. V_GE

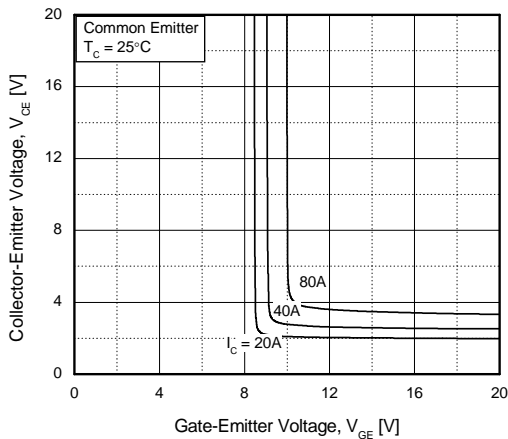
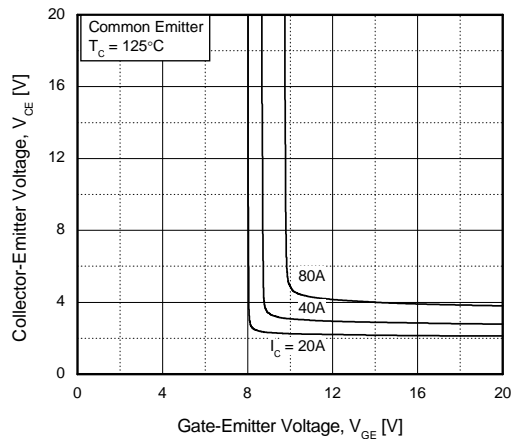


Figure 6. Saturation Voltage vs. V_GE



Typical Performance Characteristics (Continued)

Figure 7. Capacitance Characteristics

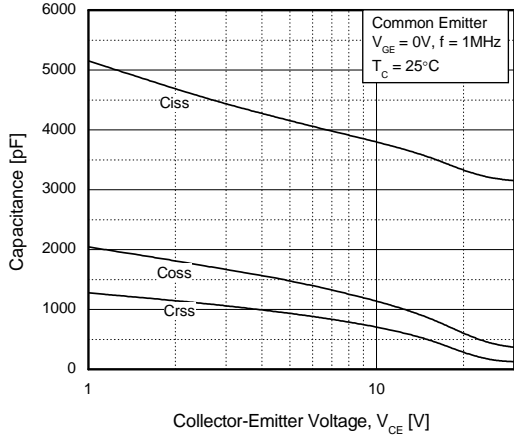


Figure 8. Turn-On Characteristics vs. Gate Resistance

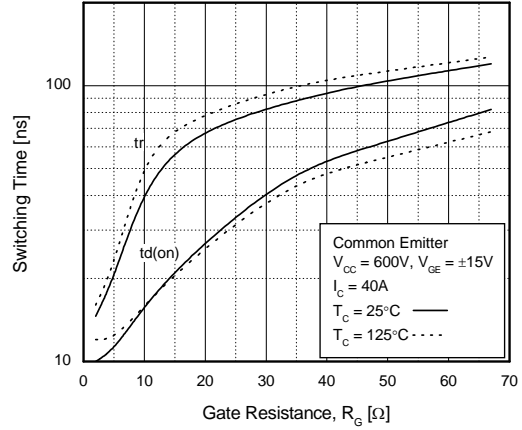


Figure 9. Turn-Off Characteristics vs. Gate Resistance

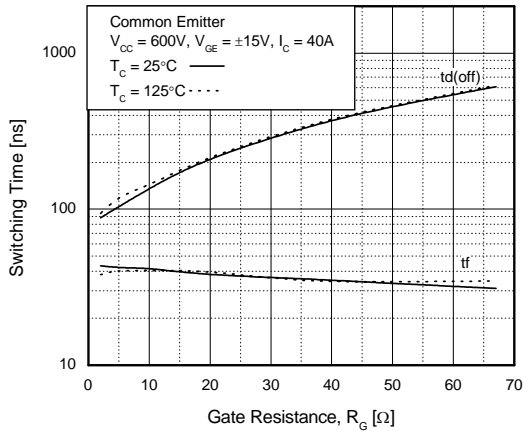


Figure 10. Switching Loss vs. Gate Resistance

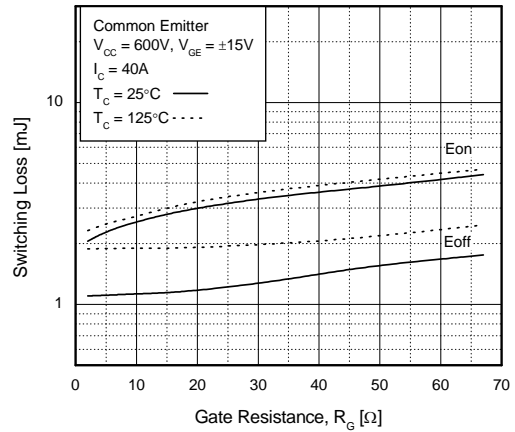


Figure 11. Turn-On Characteristics vs. Collector Current

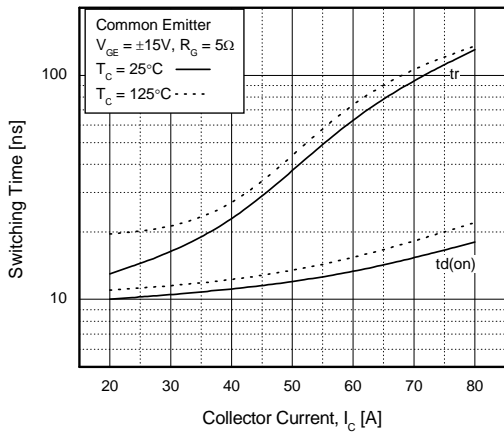
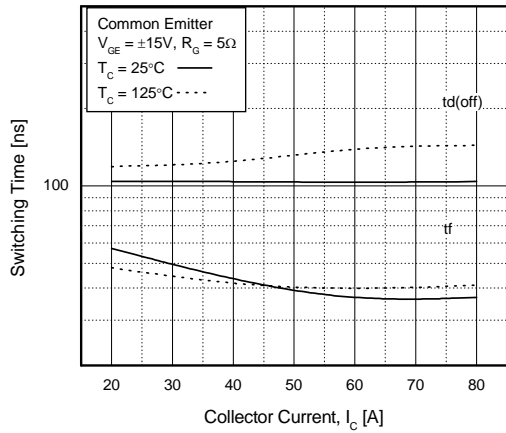


Figure 12. Turn-Off Characteristics vs. Collector Current



Typical Performance Characteristics (Continued)

Figure 13. Switching Loss vs. Collector Current

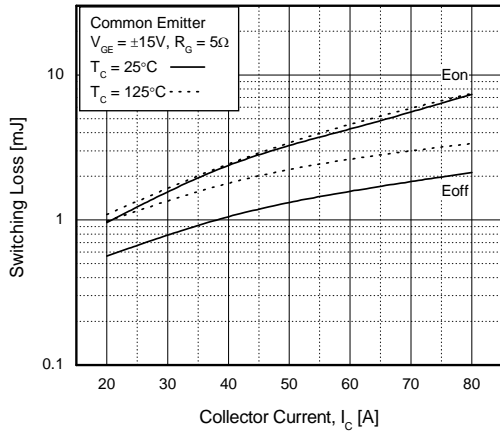


Figure 14. Gate Charge Characteristics

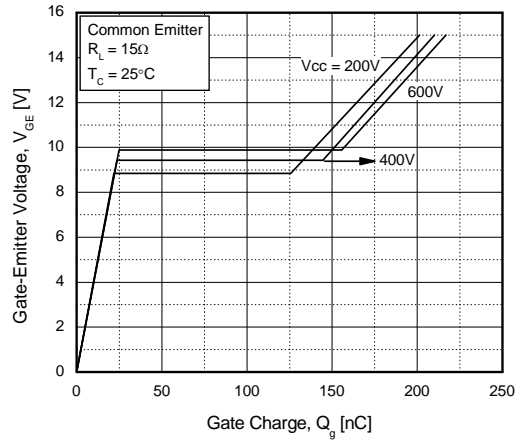


Figure 15. SOA Characteristics

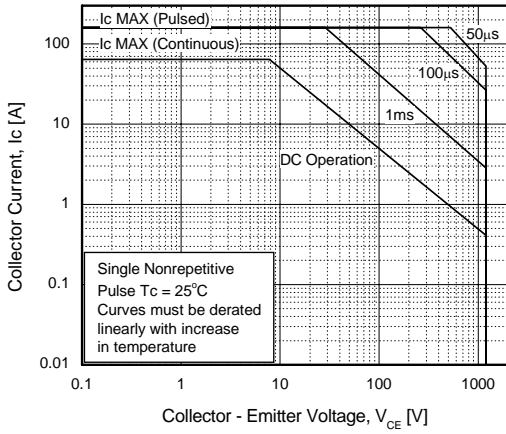


Figure 16. Turn-Off SOA

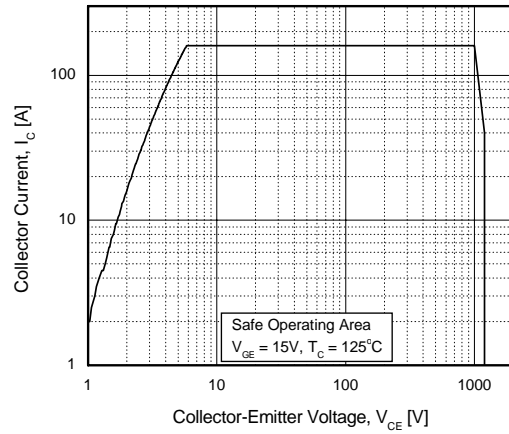
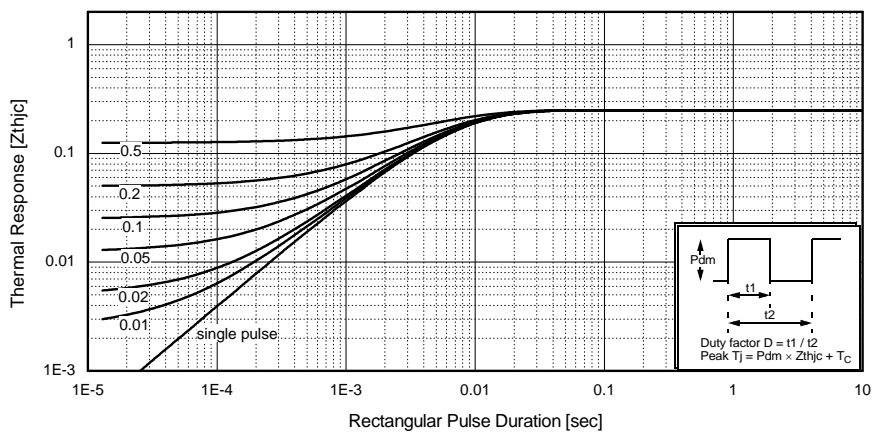



Figure 17. Transient Thermal Impedance of IGBT





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