

General Description

KEC's RC IGBTs offer low $V_{CE(sat)}$ and switching losses using advanced Trench Field Stop and reverse conducting technology. The RC IGBT is designed for IH(Induction Heating), Microwave oven and Soft-switching applications.

FEATURES

- High speed switching
- Soft current turn-off waveform
- Low saturation voltage : $V_{CE(sat)} = 1.78V$ (@ $I_C=20A$)
- Low EMI

APPLICATIONS

- Induction heating
- Microwave ovens
- Soft switching applications

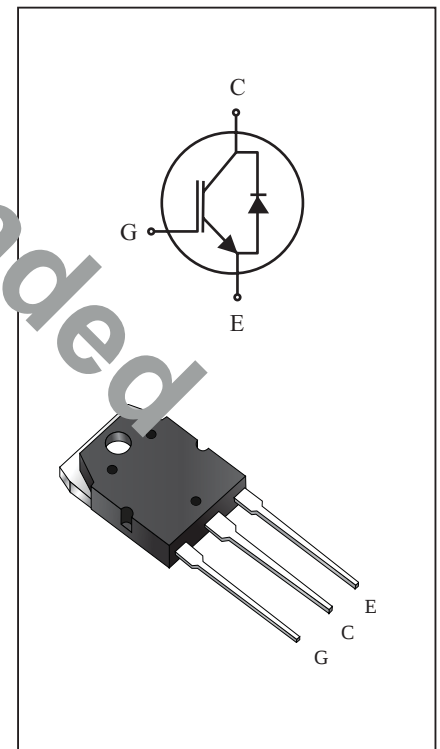
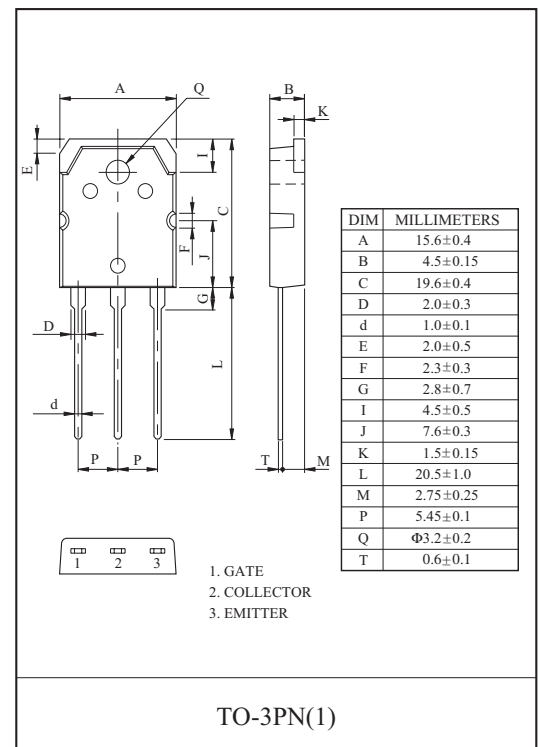
MAXIMUM RATING (Ta=25°C)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Collector-Emitter Voltage	V_{CES}	1200	V
Gate-Emitter Voltage	V_{GES}	± 20	V
Collector Current	@Tc=25	40	A
	@Tc=100	20	A
Pulsed Collector Current	I_{CM}^*	50	A
Diode Continuous Forward Current	@Tc=100	I_F	A
Diode Maximum Forward Current		I_{FM}	60 A
Maximum Power Dissipation	@Tc=25	P_D	192 W
	@Tc=100		77 W
Maximum Junction Temperature	T_j	150	
Storage Temperature Range	T_{stg}	-55 to + 150	

*Repetitive rating : Pulse width limited by max. junction temperature

THERMAL CHARACTERISTIC

CHARACTERISTIC	SYMBOL	MAX.	UNIT
Thermal Resistance, Junction to Case (IGBT)	R_{thJC}	0.65	/W
Thermal Resistance, Junction to Case (DIODE)	R_{thJC}	0.65	/W
Thermal Resistance, Junction to Ambient	R_{thJA}	40	/W



KGF20N120LRH

ELECTRICAL CHARACTERISTICS (Ta=25 °C)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Static						
Collector Cut-off Current	I _{CES}	V _{GE} =0V, V _{CE} =1200V	-	-	1.0	mA
Gate Leakage Current	I _{GES}	V _{CE} =0V, V _{GE} = ± 20V	-	-	± 100	nA
Gate Threshold Voltage	V _{GE(th)}	V _{GE} =V _{CE} , I _C =20mA	5.5	6.5	7.4	V
Collector-Emitter Saturation Voltage	V _{CE(sat)}	V _{GE} =15V, I _C =20A	-	1.78	2.05	V
		V _{GE} =15V, I _C =20A, T _C = 125	-	1.88	-	V
		V _{GE} =15V, I _C =40A	-	2.24	-	V
Diode Forward Voltage	V _F	I _F =20A	-	1.98	2.28	V
		I _F =20A, T _C =125	-	2.35	-	V
Dynamic						
Total Gate Charge	Q _g	V _{CC} =600V, V _{GE} =15V, I _C = 20A	-	108	-	nC
Gate-Emitter Charge	Q _{ge}		-	22	-	nC
Gate-Collector Charge	Q _{gc}		-	56	-	nC
Turn-Off Delay Time	t _{d(off)}	V _{CC} =600V, V _{GE} =15V, I _C =20A, R _G =10Ω Resistive Load, T _C = 25	-	140	-	ns
Fall Time	t _f		-	180	-	ns
Turn-Off Switching Loss	E _{off}		-	0.5	-	mJ
Turn-Off Delay Time	t _{d(off)}	V _{CC} =600V, V _{GE} =15V, I _C =20A, R _G =10Ω Resistive Load, T _C = 125	-	154	-	ns
Fall Time	t _f		-	403	-	ns
Turn-Off Switching Loss	E _{off}		-	1.1	-	mJ
Input Capacitance	C _{ies}	V _{CE} =30V, V _{GE} =0V, f=1MHz	-	2273	-	pF
Ouput Capacitance	C _{oes}		-	63	-	pF
Reverse Transfer Capacitance	C _{res}		-	32	-	pF

MARKING

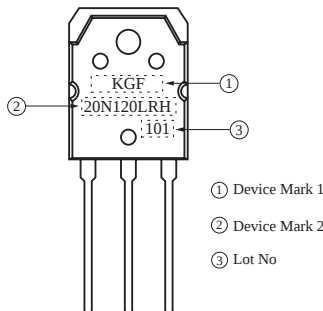


Fig 1. Saturation Voltage Characteristics

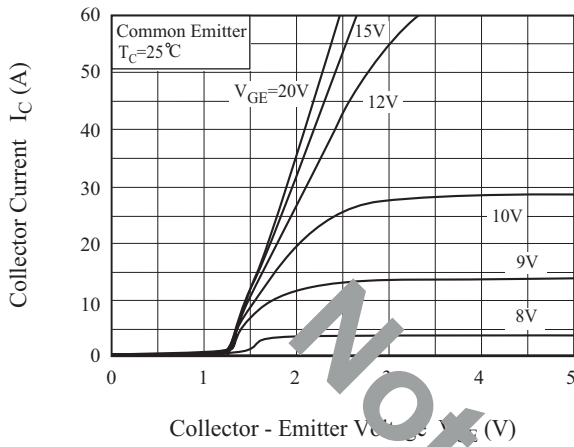


Fig 2. Saturation Voltage Characteristics

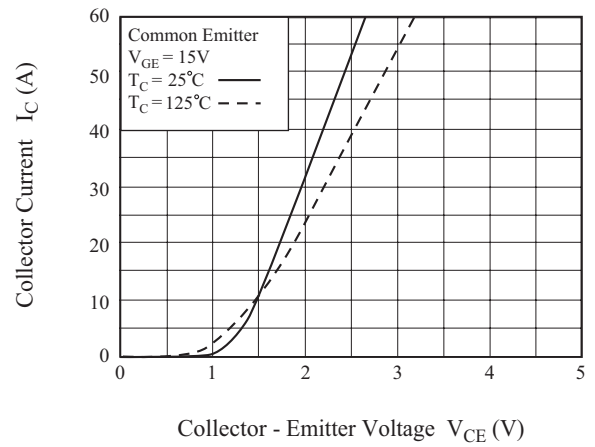


Fig 3. Saturation Voltage vs. Case Temperature

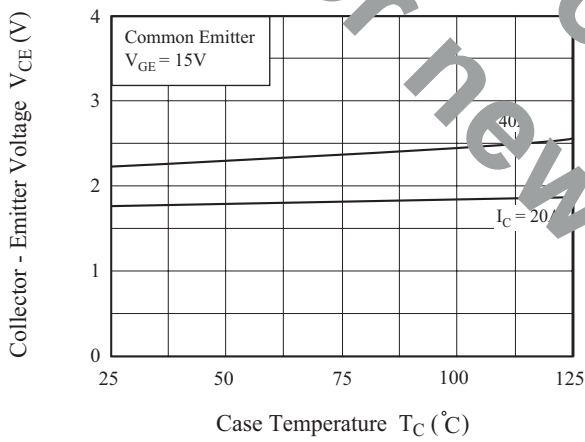


Fig 4. Saturation Voltage vs. V_{GE}

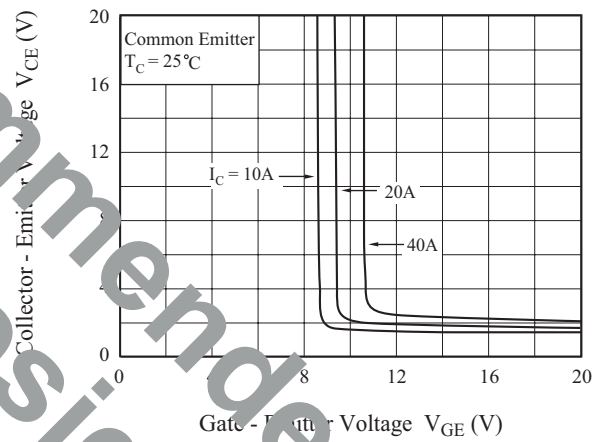


Fig 5. Saturation Voltage vs. V_{GE}

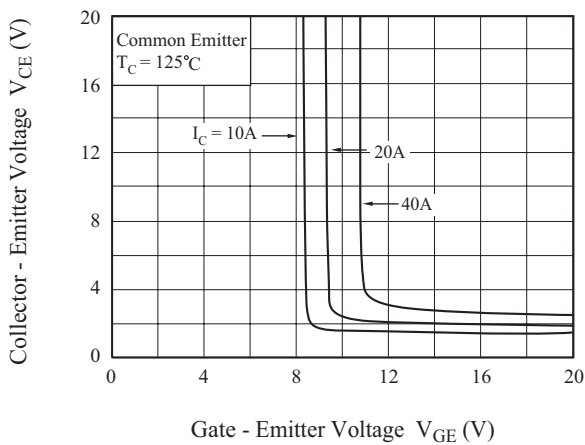


Fig 6. Capacitance Characteristics

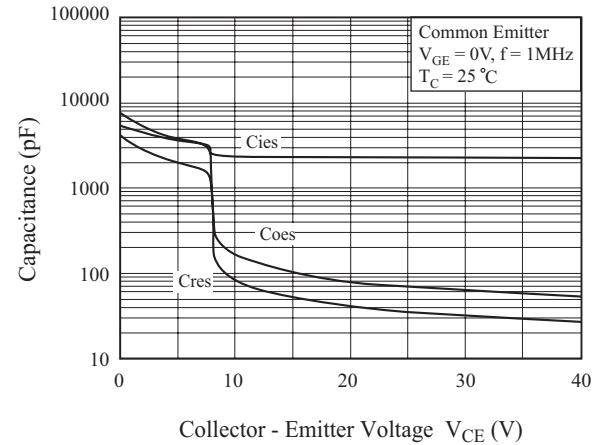


Fig 7. Turn-Off Characteristics vs. Gate Resistance

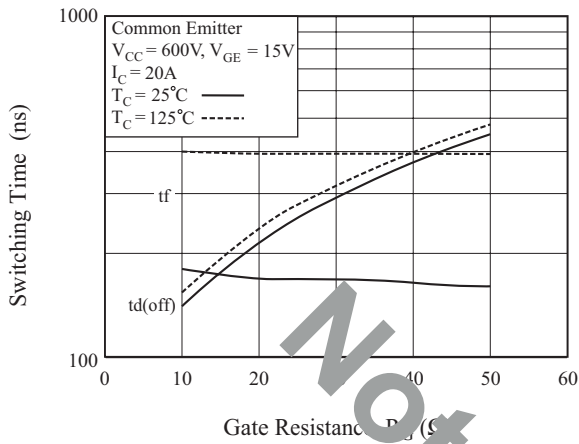


Fig 8. Switching Loss vs. Gate Resistance

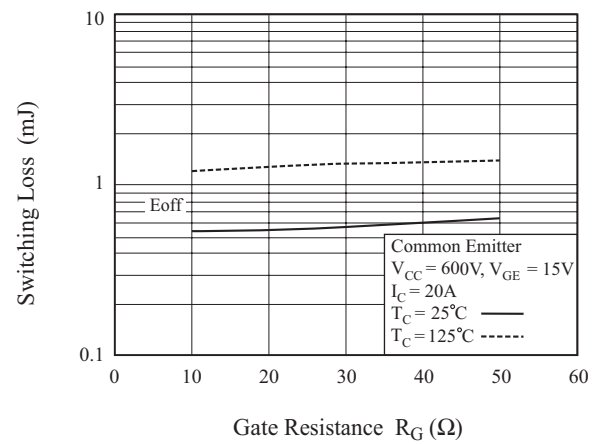


Fig 9. Turn-Off Characteristics vs. Collector Current

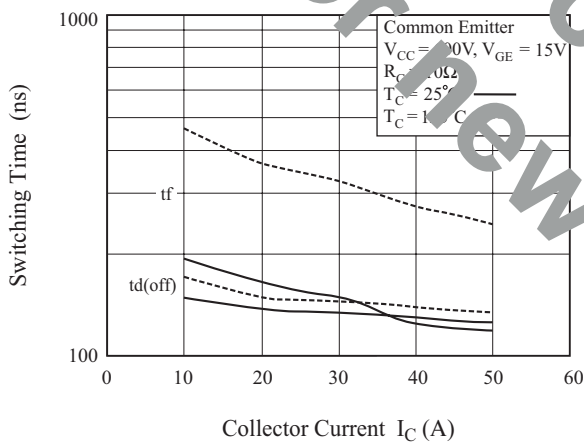


Fig 10. Switching Loss vs. Collector Current

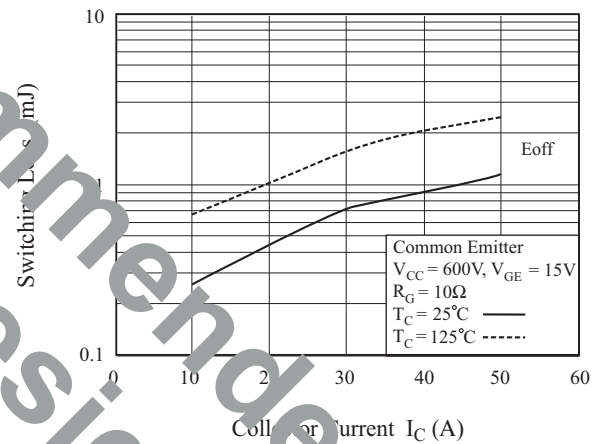


Fig 11. Gate Charge Characteristics

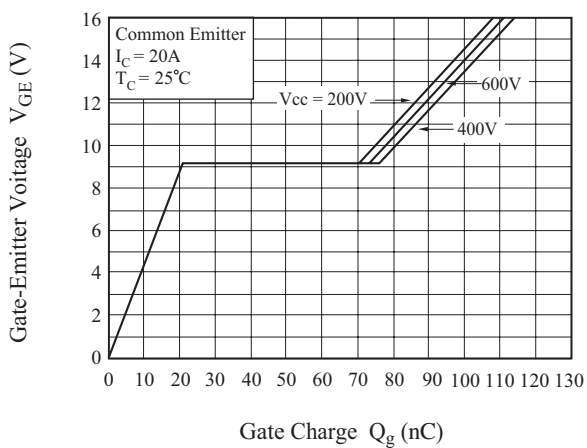


Fig 12. Forward Characteristics

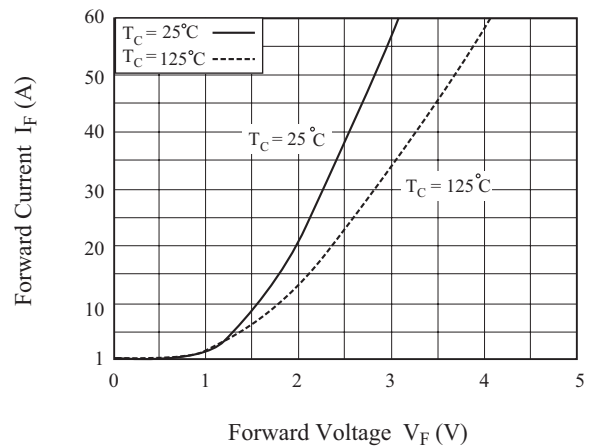


Fig 13. SOA Characteristics

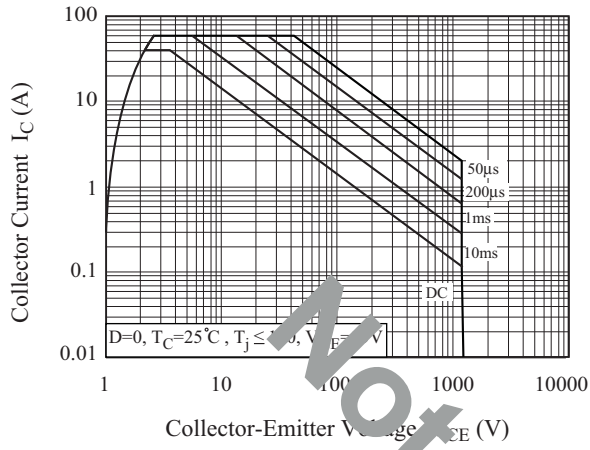


Fig 14. Transient Thermal Impedance of IGBT

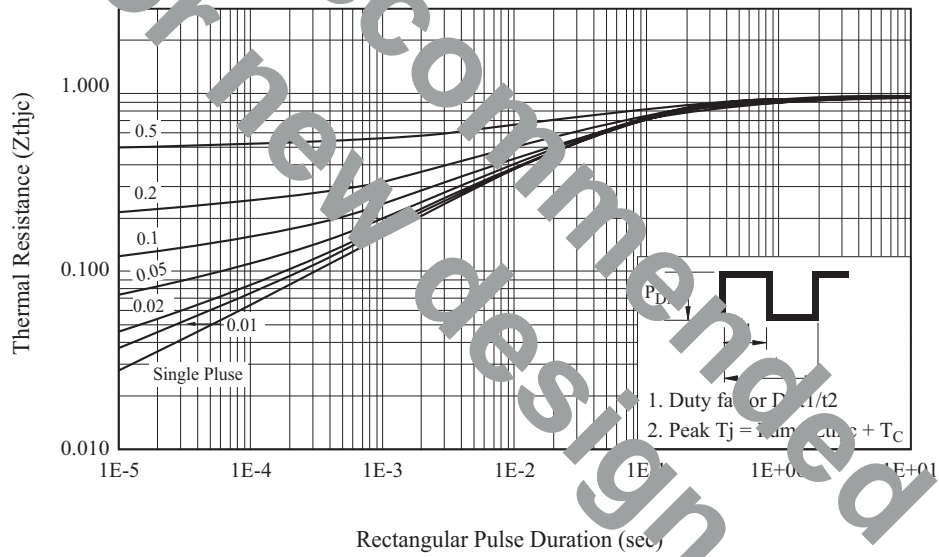


Fig 15. Switching Test Circuit

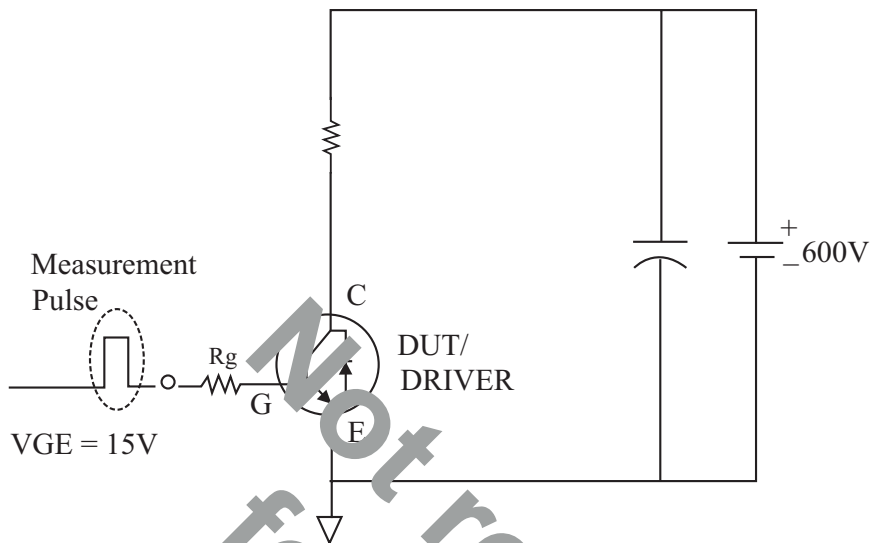


Fig 16. Definition Switching Time & Loss

