

General Description

KEC NPT IGBTs offer low switching losses, high energy efficiency and high avalanche ruggedness for soft switching application such as IH(induction heating), microwave oven, etc.

FEATURES

- High speed switching
- High system efficiency
- Soft current turn-off waveforms
- Extremely enhanced avalanche capability

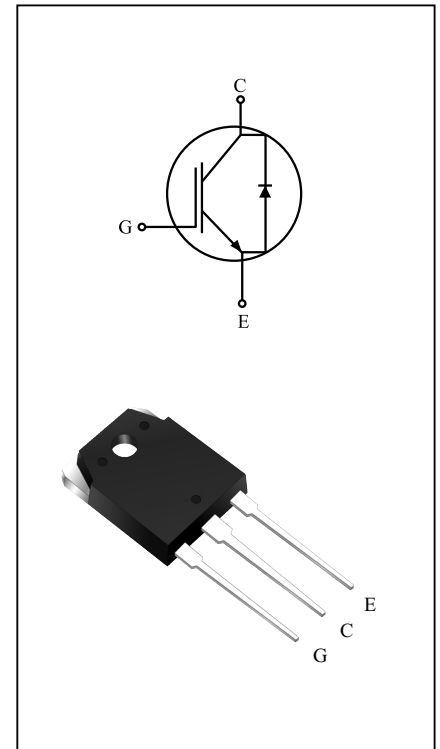
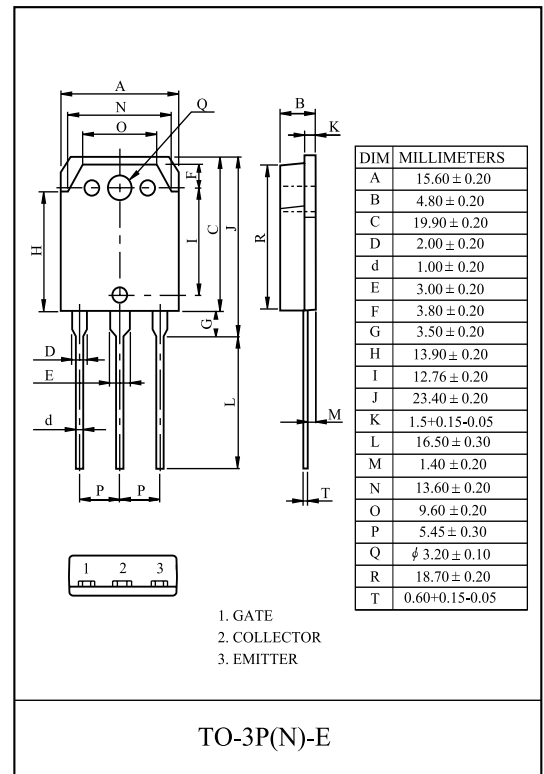
MAXIMUM RATING (Ta=25 °C)

CHARACTERISTIC		SYMBOL	RATING	UNIT
Collector-Emitter Voltage		V_{CES}	1200	V
Gate-Emitter Voltage		V_{GES}	± 20	V
Collector Current	@T _C =25	I_C	30	A
	@T _C =100		15	A
Pulsed Collector Current		I_{CM}^*	45	A
Diode Continuous Forward Current	@T _C =100	I_F	15	A
Diode Maximum Forward Current		I_{FM}	45	A
Maximum Power Dissipation	@T _C =25	P_D	176	W
	@T _C =100		70	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}	0.92	/W
Thermal Resistance, Junction to Case (DIODE)	R_{thJC}	2.8	/W
Thermal Resistance, Junction to Ambient	R_{thJA}	40	/W

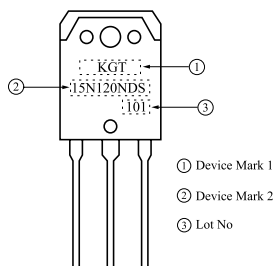


KGT15N120NDS

ELECTRICAL CHARACTERISTICS (Ta=25)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT	
Static							
Collector-Emitter Breakdown Voltage	BV _{CES}	V _{GE} =0V , I _C =1.0mA	1200	-	-	V	
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 =15mA	4.5	6.0	7.5	V	
Collector-Emitter Saturation Voltage	V _{CE(sat)}	V _{GE} =15V, I _C =15A	-	1.98	2.5	V	
		V _{GE} =15V, I _C =15A, T _C = 125	-	2.40	-	V	
		V _{GE} =15V, I _C =30A	-	2.87	-	V	
Dynamic							
Total Gate Charge	Q _g	V _{CC} =600V, V _{GE} =15V, I _C = 15A	-	70	100	nC	
Gate-Emitter Charge	Q _{ge}		-	9	-	nC	
Gate-Collector Charge	Q _{gc}		-	40	-	nC	
Turn-On Delay Time	t _{d(on)}	V _{CC} =600V, I _C =15A, V _{GE} =15V,R _G =10Ω Inductive Load, T _C = 25	-	30	-	ns	
Rise Time	t _r		-	30	-	ns	
Turn-Off Delay Time	t _{d(off)}		-	120	-	ns	
Fall Time	t _f		-	150	200	ns	
Turn-On Switching Loss	E _{on}		-	2.2	-	mJ	
Turn-Off Switching Loss	E _{off}		-	0.8	-	mJ	
Total Switching Loss	E _{ts}		-	3.1	-	mJ	
Turn-On Delay Time	t _{d(on)}		V _{CC} =600V, I _C =15A, V _{GE} =15V, R _G =10Ω Inductive Load, T _C = 125	-	35	-	ns
Rise Time	t _r			-	35	-	ns
Turn-Off Delay Time	t _{d(off)}	-		160	-	ns	
Fall Time	t _f	-		200	-	ns	
Turn-On Switching Loss	E _{on}	-		2.5	-	mJ	
Turn-Off Switching Loss	E _{off}	-		1.5	-	mJ	
Total Switching Loss	E _{ts}	-		4.0	-	mJ	
Input Capacitance	C _{ies}	V _{CE} =30V, V _{GE} =0V, f=1MHz	-	1100	-	pF	
Ouput Capacitance	C _{oes}		-	50	-	pF	
Reverse Transfer Capacitance	C _{res}		-	30	-	pF	

Marking



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ELECTRICAL CHARACTERISTIC OF DIODE

CHARACTERISTIC	SYMBOL	TEST CONDITION		MIN.	TYP.	MAX.	UNIT
Diode Forward Voltage	V _F	I _F = 15A	T _C =25	-	2.0	2.5	V
			T _C =125	-	2.3	-	
Diode Reverse Recovery Time	t _{rr}	I _F = 15A di/dt = 200A/μs	T _C =25	-	300	-	ns
			T _C =125	-	410	-	
Diode Peak Reverse Recovery Current	I _{rr}		T _C =25	-	17	25	A
			T _C =125	-	18	-	
Diode Reverse Recovery Charge	Q _{rr}		T _C =25	-	2100	4000	nC
			T _C =125	-	3200	-	

Fig 1. Saturation Voltage Characteristics

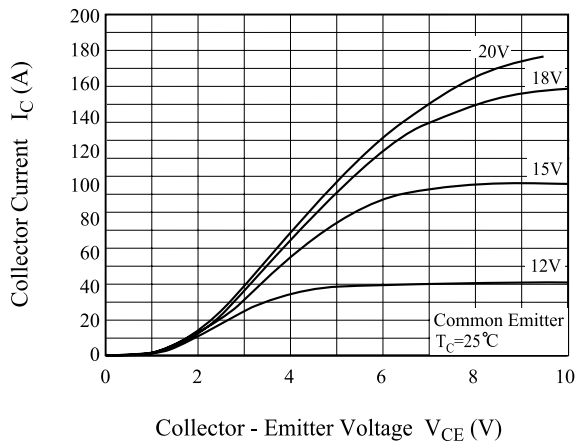


Fig 2. Saturation Voltage Characteristics

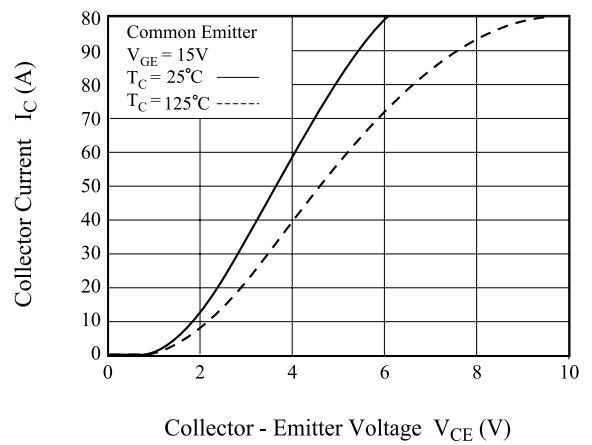


Fig 3. Saturation Voltage vs. Case Temperature

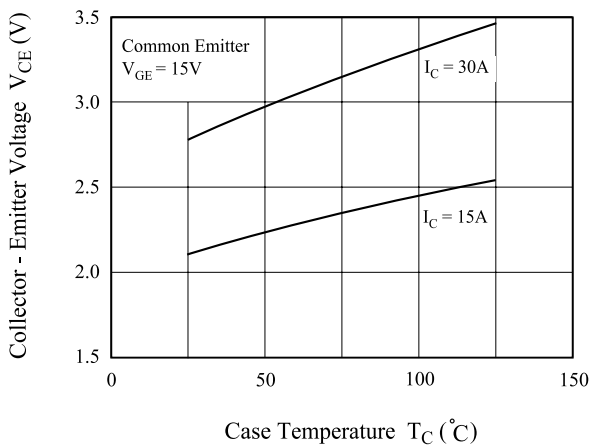


Fig 4. Saturation Voltage vs. V_{GE}

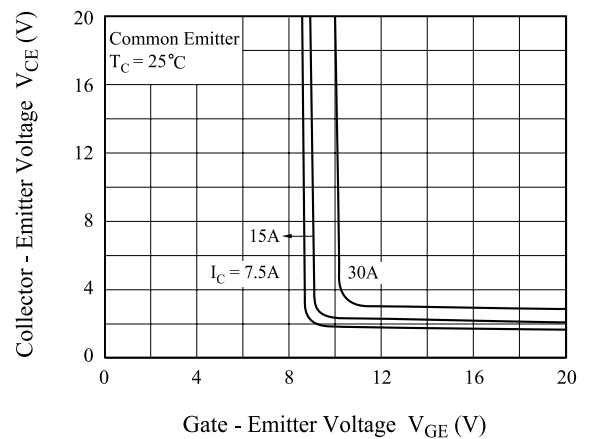


Fig 5. Saturation Voltage vs. V_{GE}

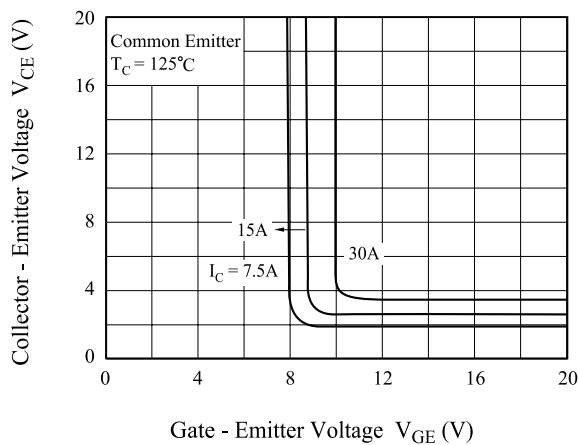


Fig 6. Capacitance Characteristics

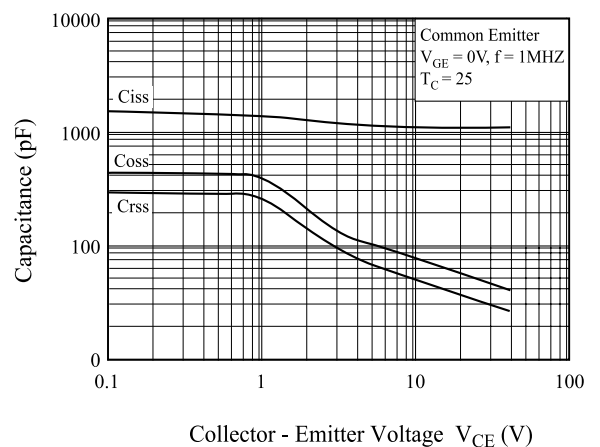


Fig 7. Turn-On Characteristics vs. Gate Resistance

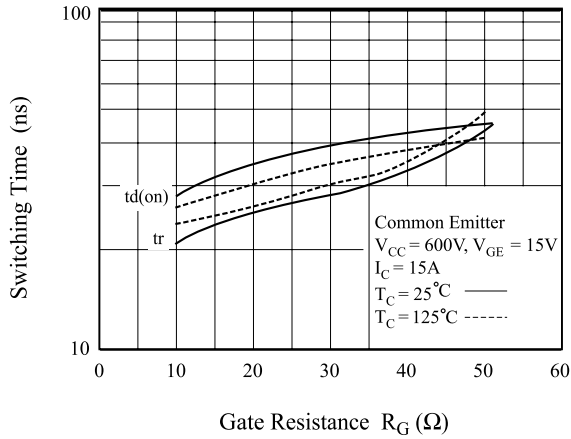


Fig 8. Turn-Off Characteristics vs. Gate Resistance

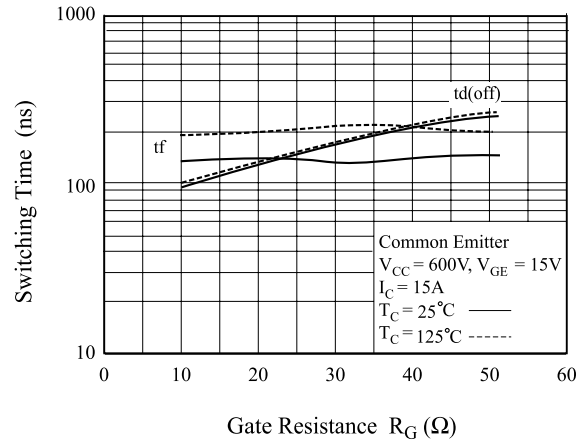


Fig 9. Switching Loss vs. Gate Resistance

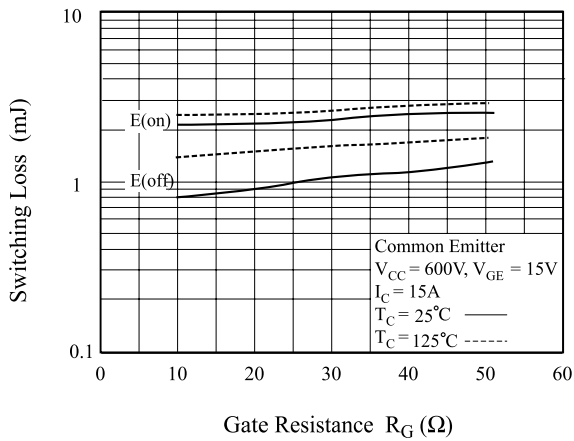


Fig 10. Turn-On Characteristics vs. Collector Current

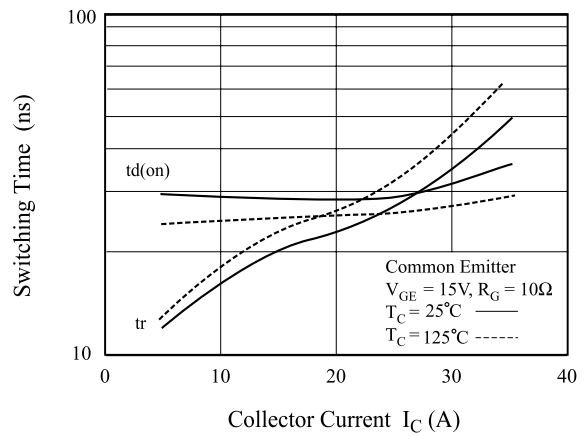


Fig 11. Turn-Off Characteristics vs. Collector Current

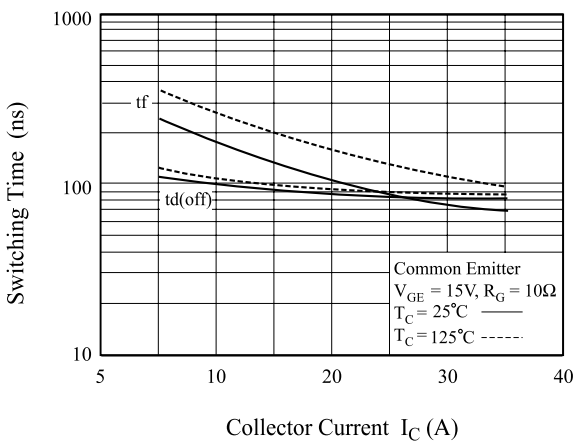
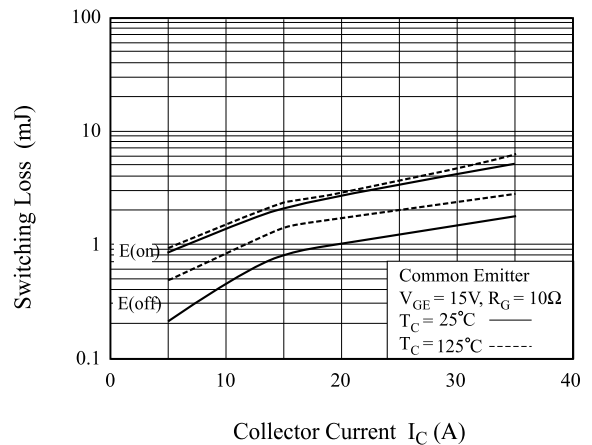


Fig 12. Switching Loss vs. Collector Current



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Fig 13. Gate Charge Characteristics

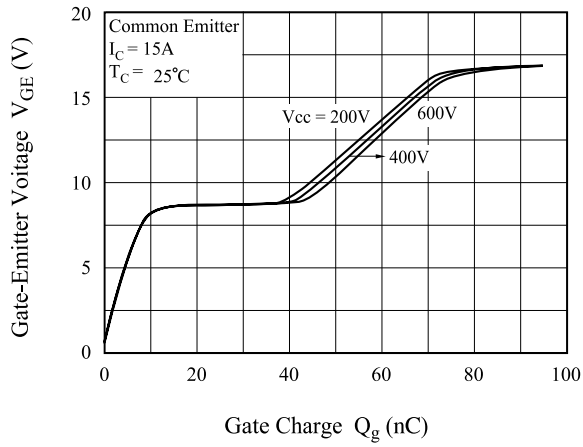


Fig 14. SOA Characteristics

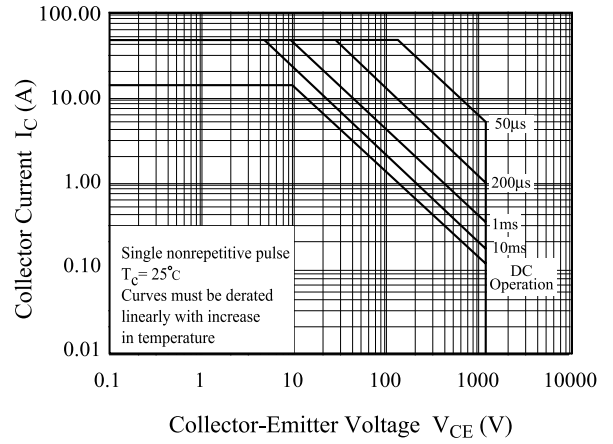


Fig 15. Turn-Off SOA

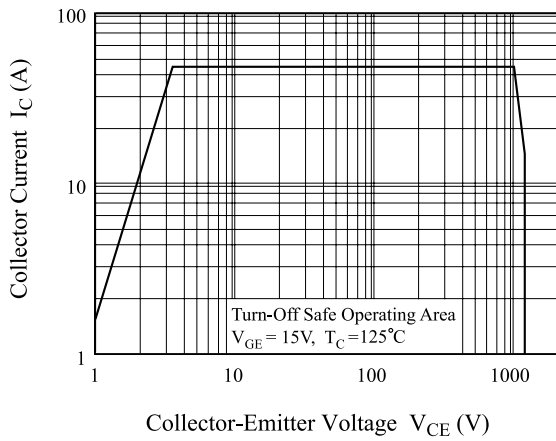


Fig 16. Transient Thermal Impedance of IGBT

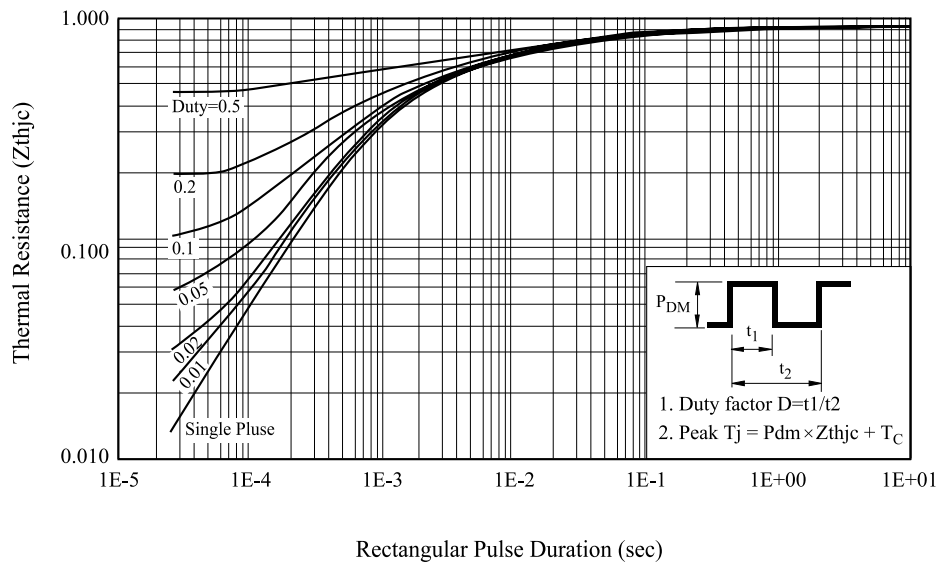


Fig 17. Forward Characteristics

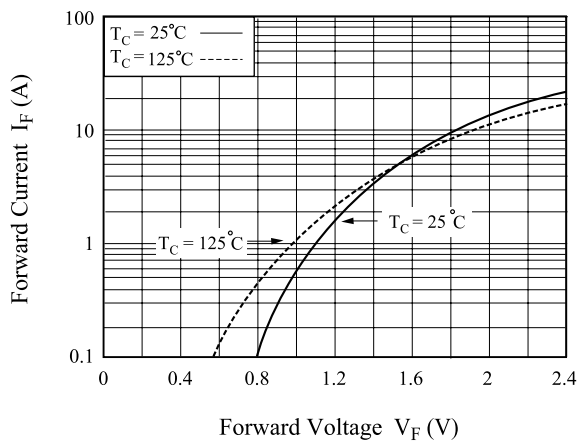


Fig 18. Reverse Recovery Current

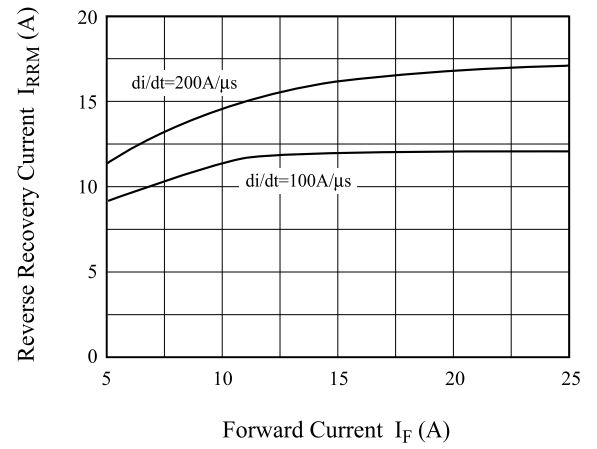


Fig 19. Reverse Recovery Time

