

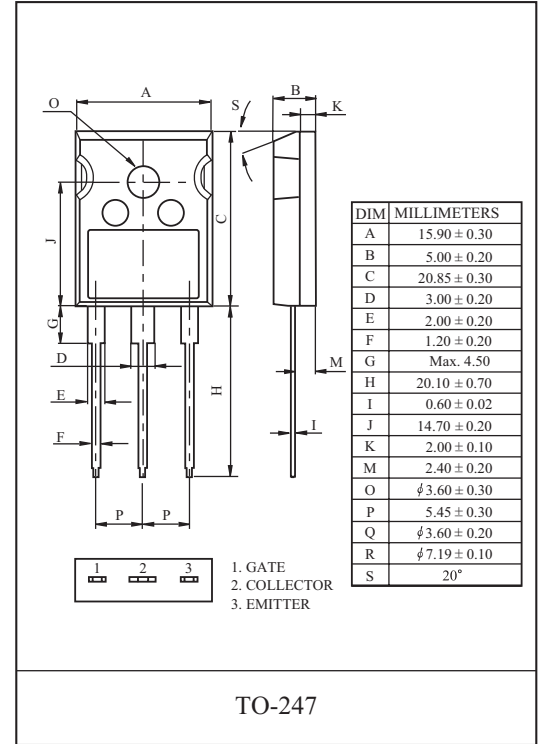
Trench NPT IGBT 1200V/30A

FEATURES

- Optimized for $V_{CE(sat)}$
- Positive $V_{CE(sat)}$ temperature coefficient
- Fast turn-on speed
- High ruggedness and temperature stable behavior
- Suffix U : Qualified to AEC-Q101.
ex) KGF30N120KA-U/HU

APPLICATIONS

- Discharge switch
- Inrush current protection circuit
- Relay replacement



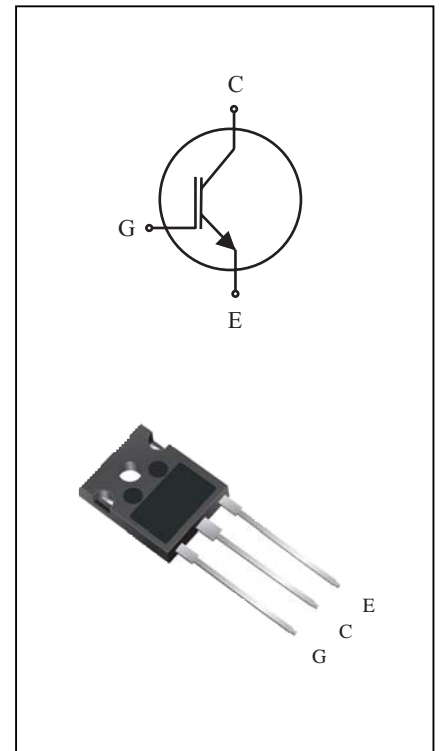
MAXIMUM RATING (Ta=25 °C)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Collector-Emitter Voltage	V_{CES}	1200	V
Gate-Emitter Voltage	V_{GES}	± 20	V
Collector Current	I_C	@Tc=25	60 A
		@Tc=100	30 A
Pulsed Collector Current	I_{CM}^*	90	A
Maximum Power Dissipation	P_D	@Tc=25	469 W
		@Tc=100	234 W
Maximum Junction Temperature	T_j	175	
Storage Temperature Range	T_{stg}	-55 to + 175	

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

THERMAL CHARACTERISTIC

CHARACTERISTIC	SYMBOL	MAX.	UNIT
Thermal Resistance, Junction to Case (IGBT)	$R_{th,JC}$	0.32	/W
Thermal Resistance, Junction to Ambient	$R_{th,JA}$	40	/W

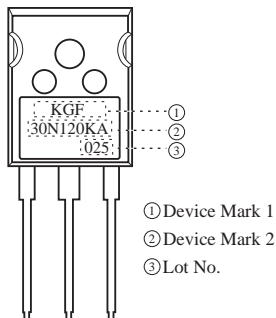


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ELECTRICAL CHARACTERISTICS (Ta=25)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT	
Static							
Collector Cut-off Current	I_{CES}	$V_{GE}=0V, V_{CE}=1200V$	-	-	500	μA	
Gate Leakage Current	I_{GES}	$V_{CE}=0V, V_{GE}= \pm 20V$	-	-	± 100	nA	
Gate Threshold Voltage	$V_{GE(th)}$	$V_{GE}=V_{CE}, I_C=1mA$	4.9	5.7	6.5	V	
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$V_{GE}=15V, I_C=25A$	-	1.81	-	V	
		$V_{GE}=15V, I_C=30A$	-	1.94	2.38	V	
		$V_{GE}=15V, I_C=30A, T_C = 150$	-	2.34	-	V	
Dynamic							
Total Gate Charge	Q_g	$V_{CC}=600V, V_{GE}=15V, I_C= 30A$	-	56	-	nC	
Gate-Emitter Charge	Q_{ge}		-	13	-	nC	
Gate-Collector Charge	Q_{gc}		-	25	-	nC	
Turn-On Delay Time	$t_{d(on)}$	$V_{CC}=600V, I_C=30A, V_{GE}=15V, R_G=10$ Resistive Load, $T_C = 25$	-	40	-	ns	
Rise Time	t_r		-	70	-	ns	
Turn-On Switching Loss	E_{on}		-	0.2	-	mJ	
Turn-Off Delay Time	$t_{d(off)}$		-	97	-	ns	
Fall Time	t_f		-	280	-	ns	
Turn-Off Switching Loss	E_{off}		-	1.78	-	mJ	
Turn-On Delay Time	$t_{d(on)}$		$V_{CC}=600V, I_C=30A, V_{GE}=15V, R_G=10$ Resistive Load, $T_C = 150$	-	42	-	ns
Rise Time	t_r			-	102	-	ns
Turn-On Switching Loss	E_{on}			-	0.3	-	mJ
Turn-Off Delay Time	$t_{d(off)}$			-	108	-	ns
Fall Time	t_f	-		500	-	ns	
Turn-Off Switching Loss	E_{off}	-		3.0	-	mJ	
Input Capacitance	C_{ies}	$V_{CE}=30V, V_{GE}=0V, f=1MHz$	-	1440	-	pF	
Output Capacitance	C_{oes}		-	118	-	pF	
Reverse Transfer Capacitance	C_{res}		-	18	-	pF	

MARKING



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Fig 1. Saturation Voltage Characteristics

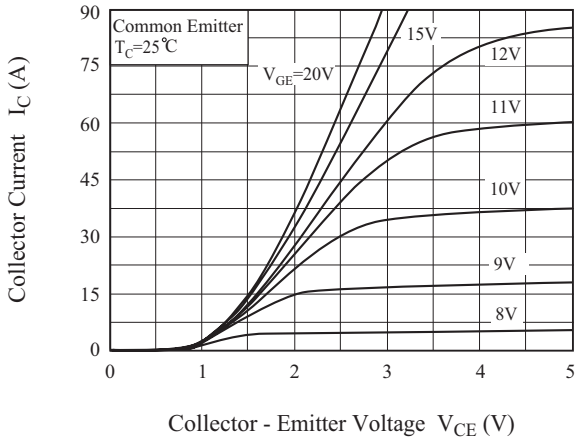


Fig 2. Saturation Voltage Characteristics

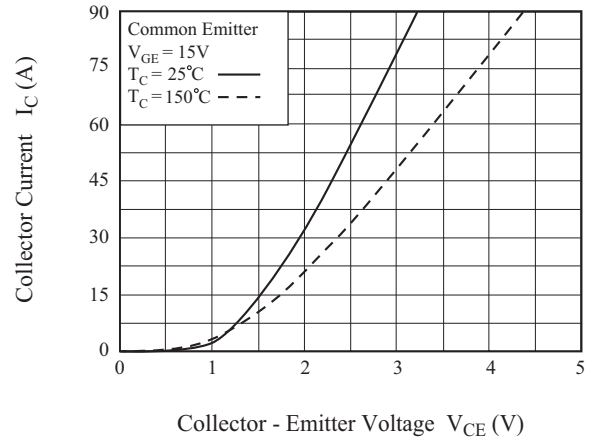


Fig 3. Saturation Voltage vs. Case Temperature

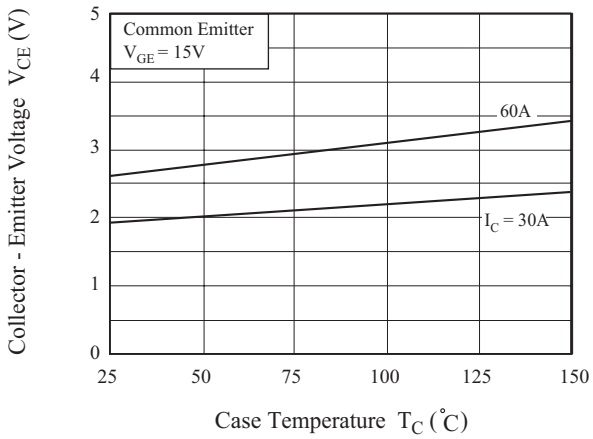


Fig 4. Saturation Voltage vs. V_{GE}

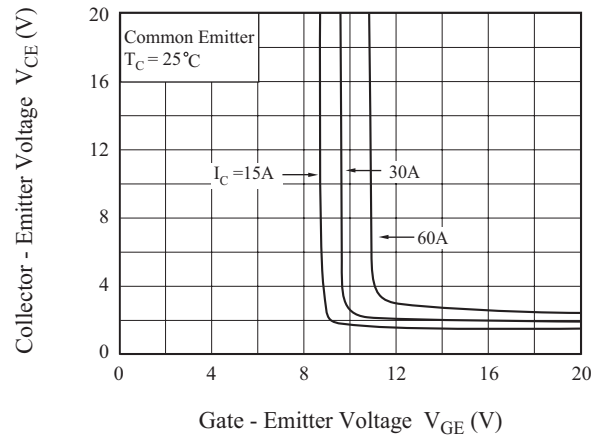


Fig 5. Saturation Voltage vs. V_{GE}

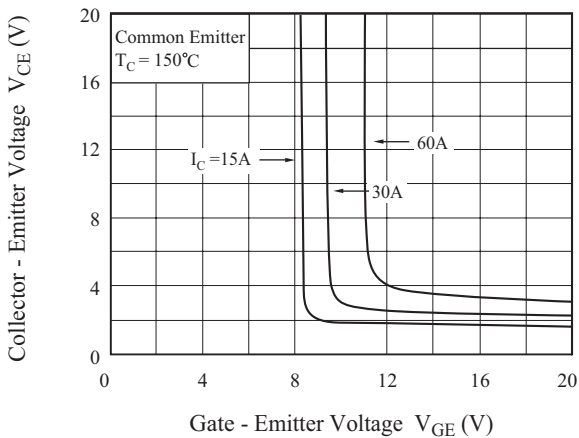
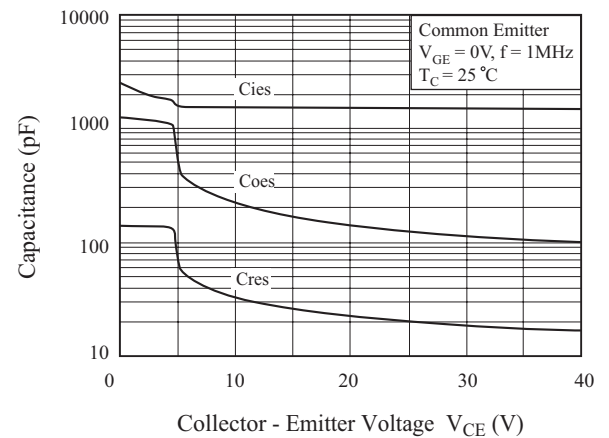


Fig 6. Capacitance Characteristics



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Fig 7. Turn-On Characteristics vs. Gate Resistance

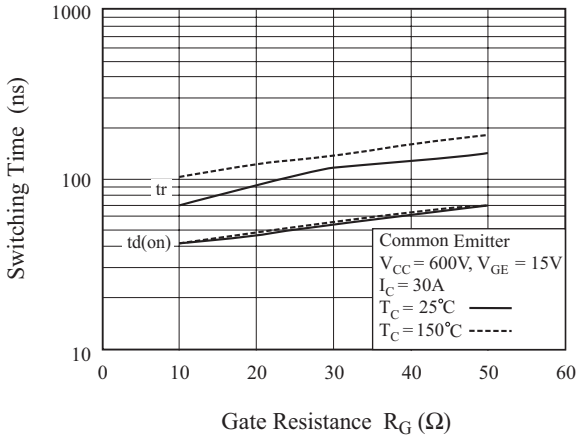


Fig 8. Turn-Off Characteristics vs. Gate Resistance

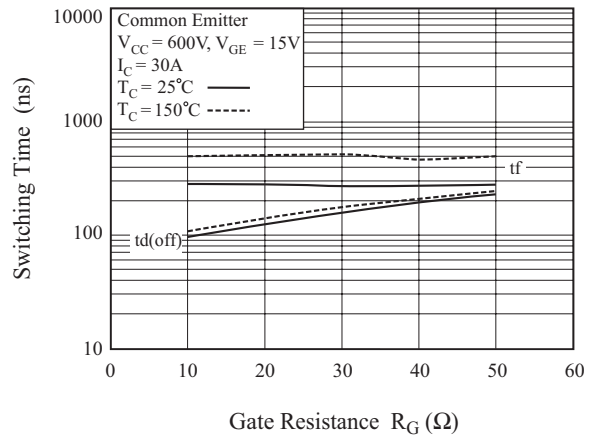


Fig 9. Switching Loss vs. Gate Resistance

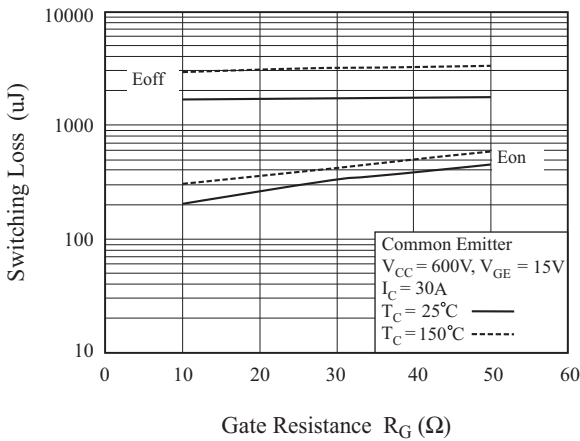


Fig 10. Turn-On Characteristics vs. Collector Current

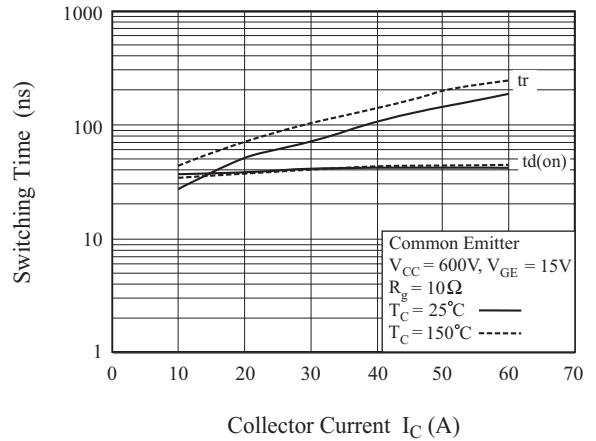


Fig 11. Turn-Off Characteristics vs. Collector Current

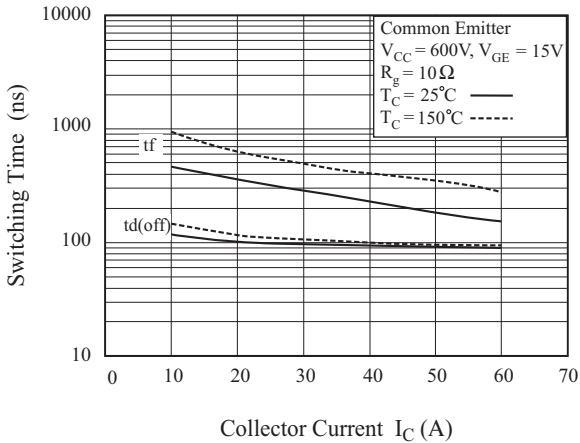
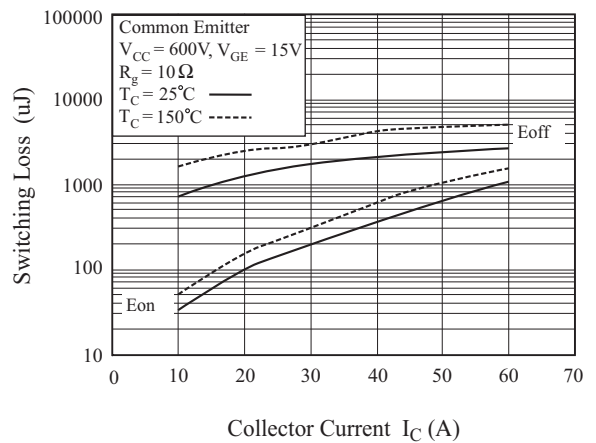


Fig 12. Switching Loss vs. Collector Current



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Fig 13. Gate Charge Characteristics

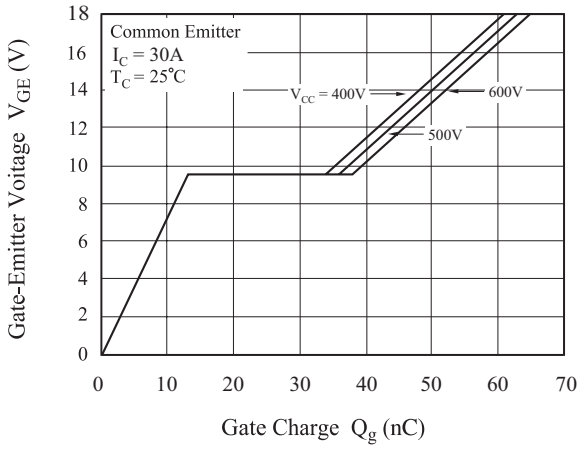


Fig 14. SOA Characteristics

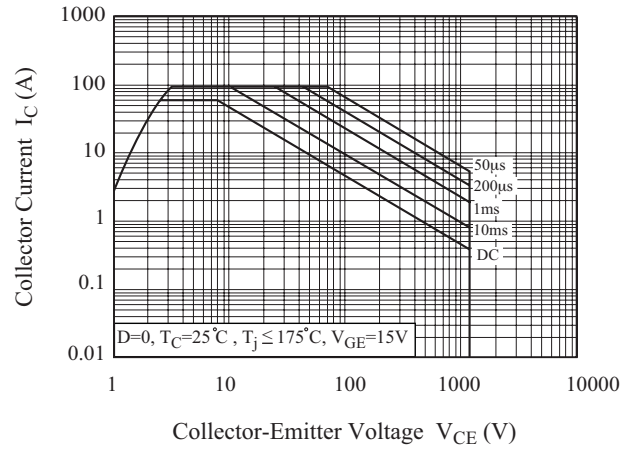
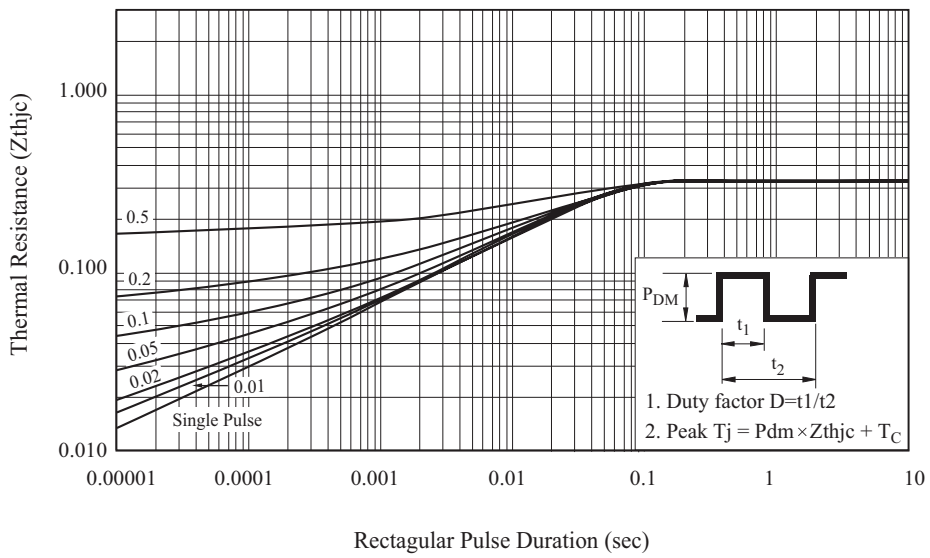


Fig 15. Transient Thermal Impedance of IGBT



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Fig 16. Switching Test Circuit

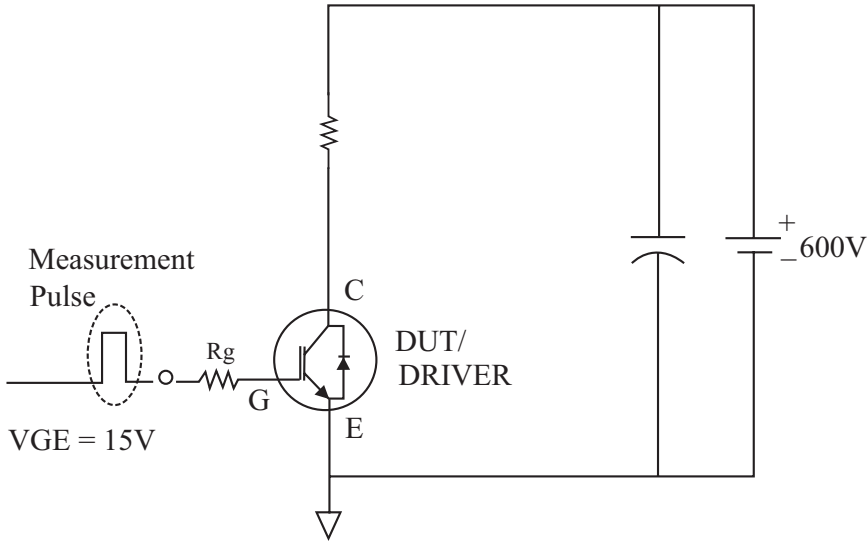


Fig 17. Definition Switching Time & Loss

