

Description

This CT30N085YF is N-Channel Enhancement Mode Power MOSFET uses advanced power trench MOSFET technology that has been especially tailored to minimize the on-state resistance and yet maintain superior switching performance. This device is well suited for high efficiency fast switching applications.

Features

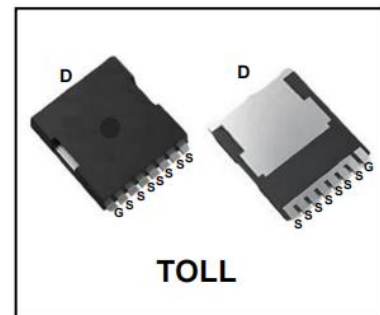
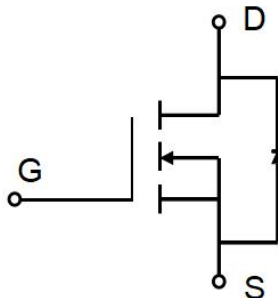
- $V_{DS} = 85V$, $I_D = 300A$
 $R_{DS(on)} < 2.2m\Omega @ V_{GS} = 10V$
- High Speed Power Switching
- Low Gate Charge
- Low $R_{DS(ON)}$
- 100% EAS Guaranteed

Applications

- DC/DC Converter
- Power Management Switching
- Motor Driver

V_{DSS}	$R_{DS(on)}$ (typ)	I_D
85V	1.75m Ω	300 A

Equivalent Circuit & Pinning



Absolute Maximum Ratings(Ta=25°C)

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	85	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current	T _C =25°C	I_D	300	A
	T _C =100°C		190	
Pulsed Drain Current ¹		I_{DM}	1200	A
Single Pulse Avalanche Energy ²		EAS	625	mJ
Total Power Dissipation	T _C =25°C	P_D	347.2	W
Operating Junction and Storage Temperature Range		T_J, T_{STG}	-55 to 150	°C

Thermal Characteristics

Parameter	Symbol	Value	Unit
Thermal Resistance from Junction-to-Ambient ³	R_{θJA}	40	°C/W
Thermal Resistance from Junction-to-Case	R_{θJC}	0.36	°C/W

Electrical Characteristics(Ta=25°C)

Parameter		Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Static Characteristics							
Drain-Source Breakdown Voltage		V _{(BR)DSS}	V _{GS} = 0V, I _D = 250μA	85	-	-	V
Gate-body Leakage current		I _{GSS}	V _{DS} = 0V, V _{GS} = ±20V	-	-	±100	nA
Zero Gate Voltage Drain Current	T _J =25°C	I _{DSS}	V _{DS} = 85V, V _{GS} = 0V	-	-	1	μA
	T _J = 100°C			-	-	100	
Gate-Threshold Voltage		V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250μA	2	3	4	V
Drain-Source on-Resistance ⁴		R _{DS(on)}	V _{GS} = 10V, I _D = 20A	-	1.75	2.2	mΩ
Forward Transconductance ⁴		g _{fs}	V _{DS} = 10V, I _D =20A	-	73	-	S
Dynamic Characteristics ⁵							
Input Capacitance		C _{iss}	V _{DS} = 40V, V _{GS} =0V, f =1MHz	-	8915	-	pF
Output Capacitance		C _{oss}		-	1515	-	
Reverse Transfer Capacitance		C _{rss}		-	73	-	
Gate Resistance		R _g	f=1MHz	-	2.4	-	Ω
Switching Characteristics ⁵							
Total Gate Charge		Q _g	V _{GS} = 10V, V _{DS} = 40V, I _D = 20A	-	142	-	nC
Gate-Source Charge		Q _{gs}		-	35.5	-	
Gate-Drain Charge		Q _{gd}		-	37	-	
Turn-on Delay Time		t _{d(on)}	V _{GS} =10V, V _{DD} = 40V, R _G = 3Ω, I _D = 20A	-	24	-	ns
Rise Time		t _r		-	70	-	
Turn-off Delay Time		t _{d(off)}		-	84	-	
Fall Time		t _f		-	54	-	
Body Diode Reverse Recovery Time		t _{rr}	I _F =20A, di/dt = 100A/μs	-	96	-	ns
Body Diode Reverse Recovery Charge		Q _{rr}		-	168	-	nC
Drain-Source Body Diode Characteristics							
Diode Forward Voltage ⁴		V _{SD}	I _S = 20A, V _{GS} = 0V	-	-	1.2	V
Continuous Source Current	T _C =25°C	I _S	-	-	-	300	A

Notes:

1. Repetitive rating, pulse width limited by junction temperature $T_{J(MAX)} = 150^\circ C$.
2. The EAS data shows Max. rating . The test condition is $V_{DD} = 25V, V_{GS} = 10V, L = 0.5mH, I_{AS} = 50A$.
3. The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper, The value in any given application depends on the user's specific board design.
4. The data tested by pulsed , pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
5. This value is guaranteed by design hence it is not included in the production test.

Typical Characteristics

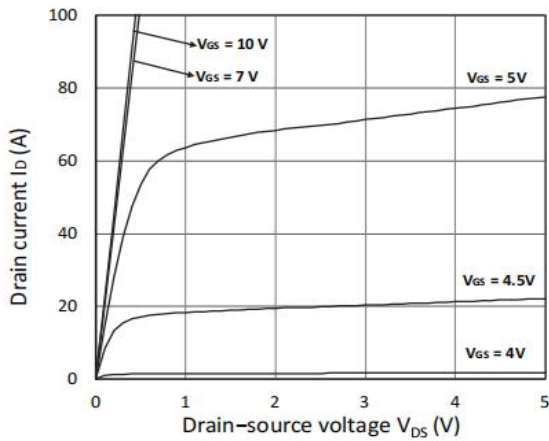


Figure 1. Output Characteristics

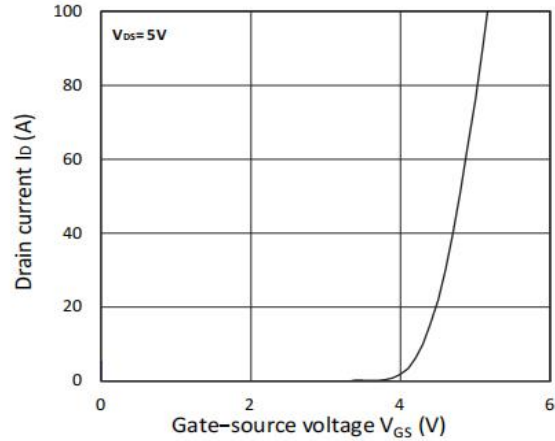


Figure 2. Transfer Characteristics

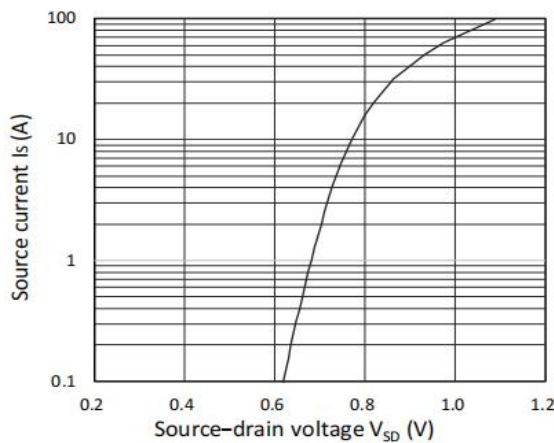


Figure 3. Forward Characteristics of Reverse

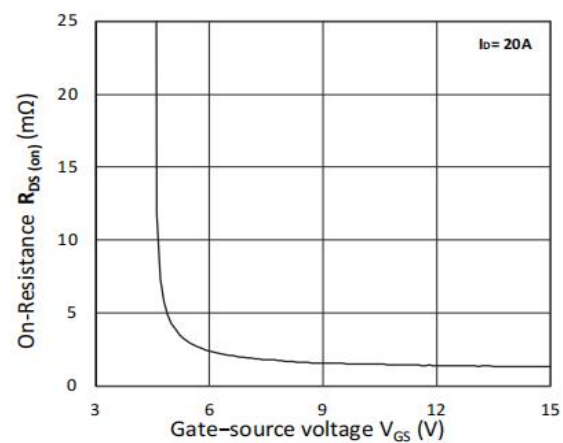


Figure 4. $R_{DS(on)}$ vs. V_{GS}

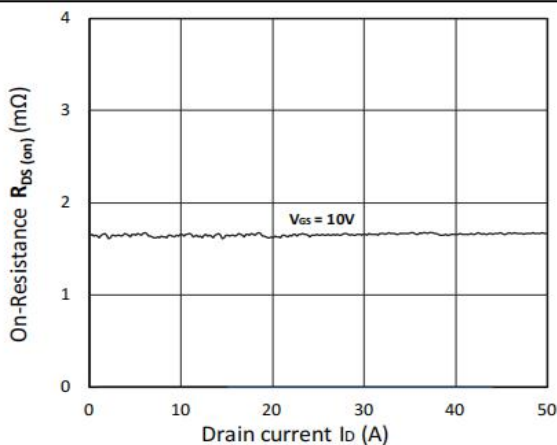


Figure 5. $R_{DS(on)}$ vs. I_D

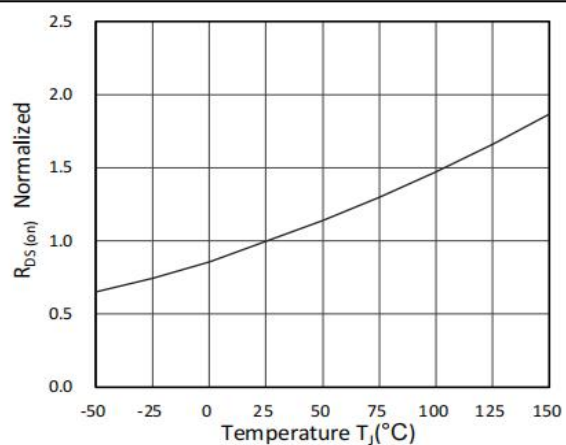


Figure 6. Normalized $R_{DS(on)}$ vs. Temperature

Typical Characteristics

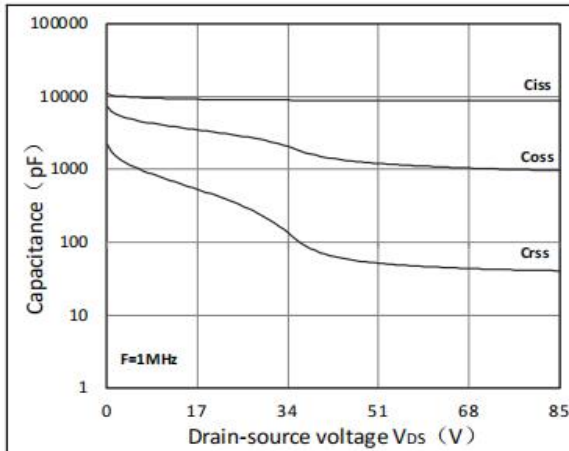


Figure 7. Capacitance Characteristics

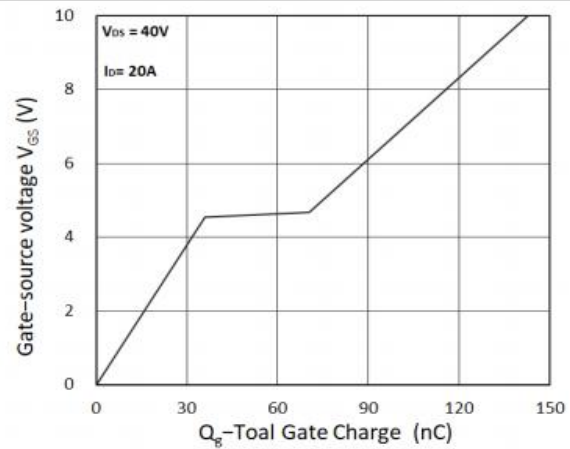


Figure 8. Gate Charge Characteristics

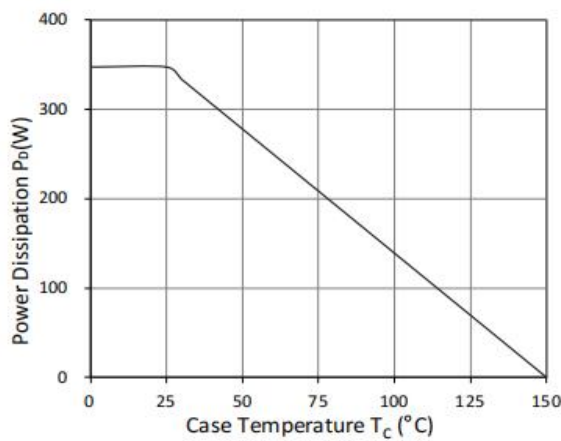


Figure 9. Power Dissipation

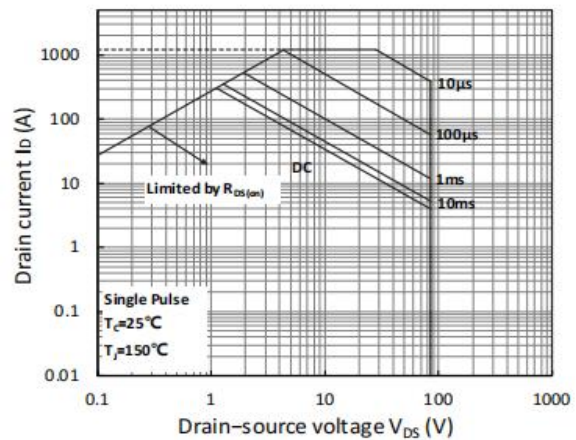


Figure10. Safe Operating Area

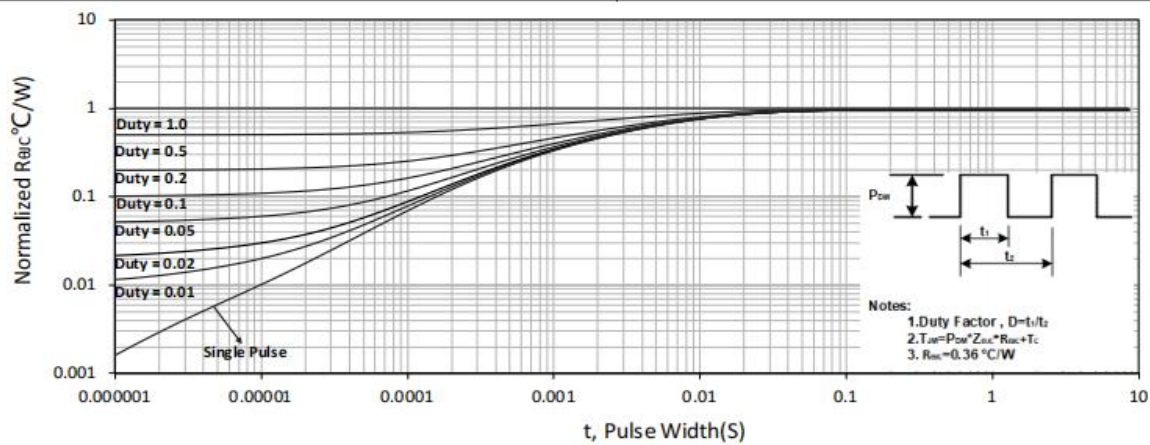


Figure 11. Normalized Maximum Transient Thermal Impedance

Test Circuit

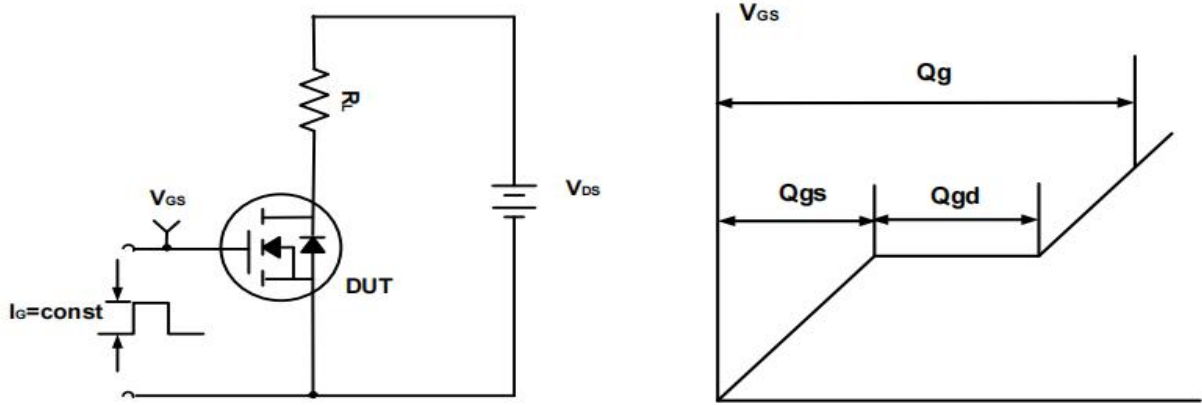


Figure A. Gate Charge Test Circuit & Waveforms

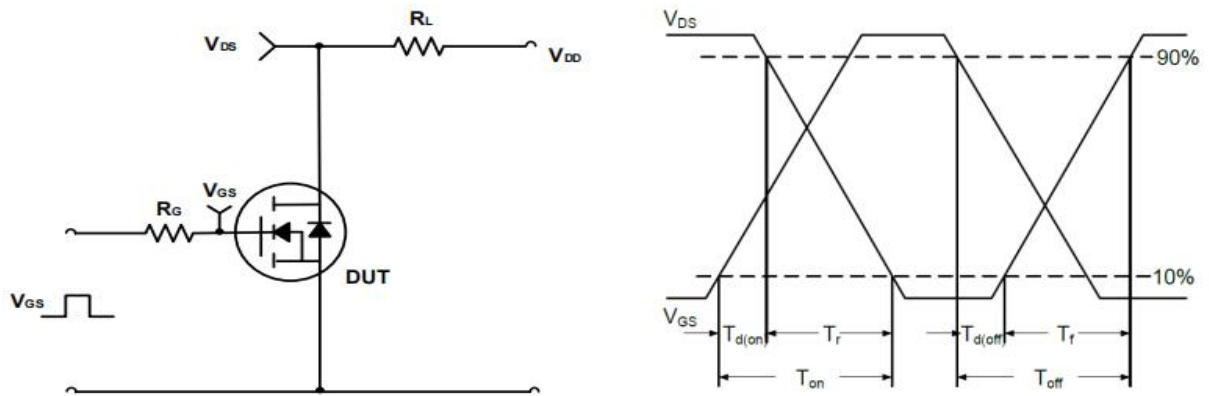


Figure B. Switching Test Circuit & Waveforms

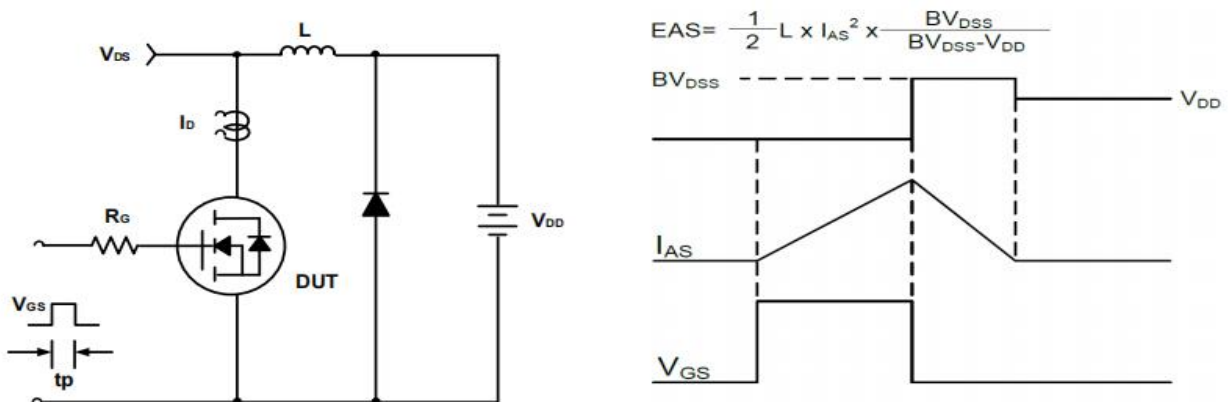
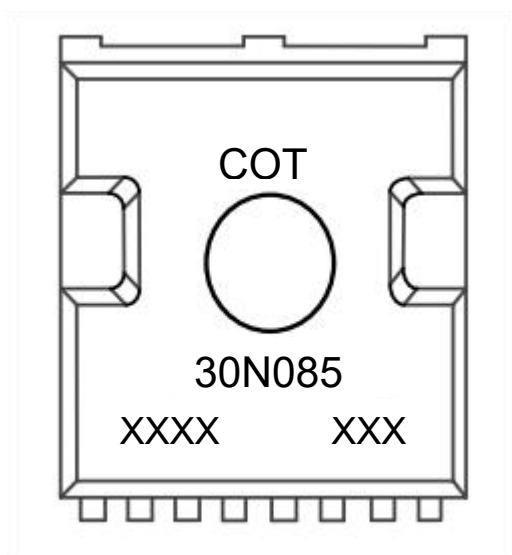


Figure C. Unclamped Inductive Switching Circuit & Waveforms

Marking Codes

Part	Package	Marking	Packing method
CT30N085YF	TOLL	30N085	Tape and Reel

Marking Information

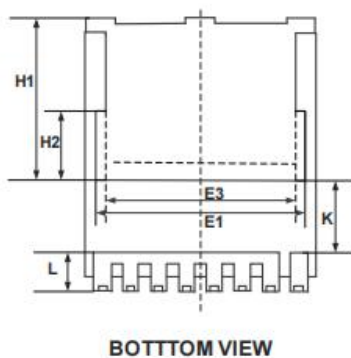
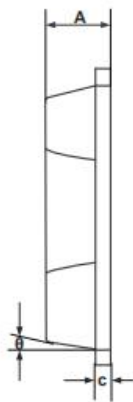
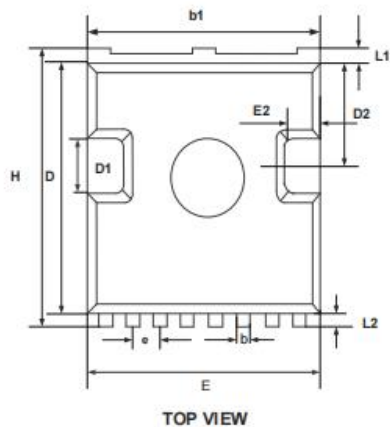


COT= Company Logo

30N85YF= Device code

XXXX XXX= Date code

Mechanical Dimensions



COMMON DIMENSIONS

SYMBOL	MM	
	MIN	MAX
A	2.20	2.40
b	0.60	0.90
b1	9.70	9.90
c	0.40	0.60
D	10.20	10.60
D1	3.10	3.50
D2	4.45	4.75
E	9.70	10.10
E1	9.20BSC	
E2	0.50	0.70
E3	7.8BSC	
e	1.200 BSC	
H	11.45	11.90
H1	6.75 BSC	
H2	2.80 BSC	
K	3.10 REF	
L	1.70	2.10
L1	0.60	0.80
L2	0.50	0.70
θ	10° REF	