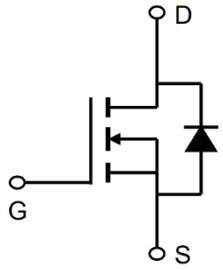
40V N-Channel Enhancement Mode MOSFET

PDFN5×6-8L



General Features

V_{DS} = 40V I_D =60 A

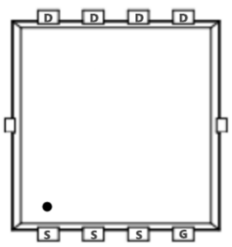
$R_{DS(ON)}$ < 8.6mΩ @ V_{GS}=10V TYP 7.2mΩ

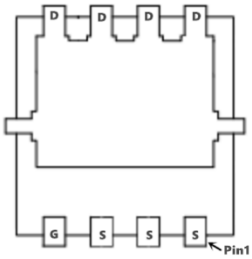
Application

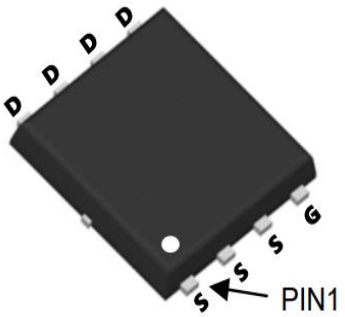
Battery protection

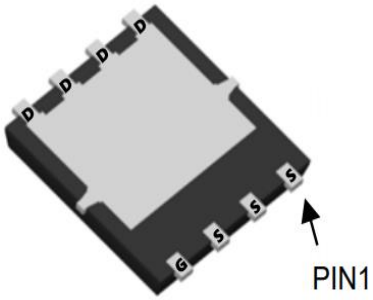
Load switch

Uninterruptible power supply









Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
CTK60N04DF5	PDFN5×6-8L	CTK60N04DF5	5000

Absolute Maximum Ratings (T_C=25℃unless otherwise noted)

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	40	V
V_{GS}	Gate-Source Voltage	±20	V
I_D@T_C=25℃	Continuous Drain Current, V_{GS} @ 10V[1]	60	A
I_D@T_C=100℃	Continuous Drain Current, V_{GS} @ 10V[1]	28	A
I_D@T_A=25℃	Continuous Drain Current, V_{GS} @ 10V[1]	10	A
I_D@T_A=70℃	Continuous Drain Current, V_{GS} @ 10V[1]	8	A
I_{DM}	Pulsed Drain Current[2]	100	A
EAS	Single Pulse Avalanche Energy[3]	72	mJ
I_{AS}	Avalanche Current	40	A
P_D@T_C=25℃	Total Power Dissipation[4]	46	W
T_{STG}	Storage Temperature Range	-55 to 150	℃
T_J	Operating Junction Temperature Range	-55 to 150	℃
$R_{\theta JA}$	Thermal Resistance Junction-ambient (Steady State)[1]	62	℃/W
$R_{\theta JC}$	Thermal Resistance Junction-Case[1]	2.7	℃/W

Electrical Characteristics (T_J=25℃, unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BVDSS	Drain-Source Breakdown Voltage	V_{GS}=0V , I_D=250uA	40	45	---	V
△BVDSS/△TJ	BVDSS Temperature Coefficient	Reference to 25℃ , I_D=1mA	---	0.034	---	V/℃
RDS(ON)	Static Drain-Source On-Resistance[2]	V_{GS}=10V , I_D=20A	---	7.2	8.6	mΩ
		V_{GS}=4.5V , I_D=15A	---	10.7	14	
VGS(th)	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D =250uA	1.0	1.5	2.0	V
△$V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient		---	-5.64	---	mV/℃
IDSS	Drain-Source Leakage Current	V_{DS}=40V , V_{GS}=0V , T_J=25℃	---	---	1	uA
		V_{DS}=32V , V_{GS}=0V , T_J=55℃	---	---	5	
IGSS	Gate-Source Leakage Current	V_{GS}=±20V , V_{DS}=0V	---	---	±100	nA
gfs	Forward Transconductance	V_{DS}=5V , I_D=20A	---	36	---	S
R_g	Gate Resistance	V_{DS}=0V , V_{GS}=0V , f=1MHz	---	2.6	---	Ω
Q_g	Total Gate Charge (4.5V)	V_{DS}=20V , V_{GS}=4.5V , I_D=12A	---	10.7	---	nC
Qgs	Gate-Source Charge		---	3.3	---	
Qgd	Gate-Drain Charge		---	4.2	---	
Td(on)	Turn-On Delay Time	V_{DD}=12V , V_{GS}=10V , R_G=3.3Ω I_D=6A	---	8.6	---	ns
T_r	Rise Time		---	3.4	---	
Td(off)	Turn-Off Delay Time		---	25	---	
T_f	Fall Time		---	2.2	---	
Ciss	Input Capacitance	V_{DS}=15V , V_{GS}=0V , f=1MHz	---	1833	---	pF
Coss	Output Capacitance		---	135	---	
Crss	Reverse Transfer Capacitance		---	119	---	
IS	Continuous Source Current[1,5]	V_G=V_D=0V , Force Current	---	---	46	A
ISM	Pulsed Source Current[2,5]		---	---	100	A
VSD	Diode Forward Voltage[2]	V_{GS}=0V , I_S=20A , T_J=25℃	---	0.9	1.2	V

Note :

1、The data tested by surface mounted on a 1 inch^2 FR-4 board with 2OZ copper.

2、The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%

3、The EAS data shows Max. rating . The test condition is V_{DD}=25V,V_{GS}=10V,L=0.1mH,I_{AS}=20A

4、The power dissipation is limited by 150℃ junction temperature

5 、The data is theoretically the same as I_D and I_{DM} , in real applications , should be limited by total power dissipation.

Typical Characteristics

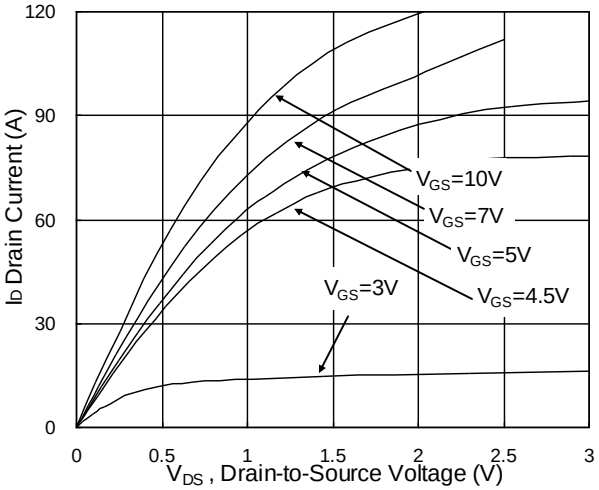


Fig.1 Typical Output Characteristics

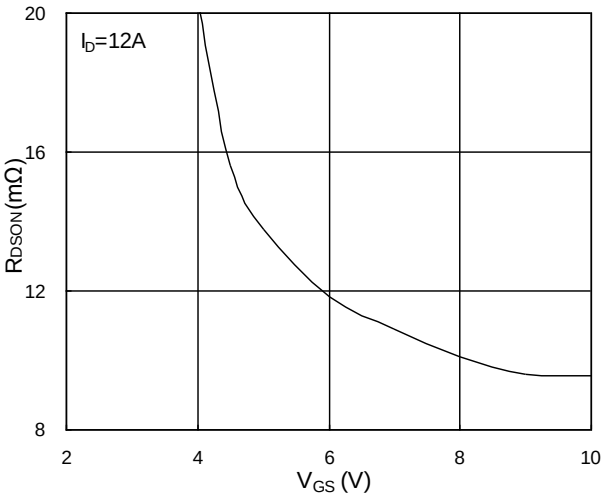


Fig.2 On-Resistance vs. G-S Voltage

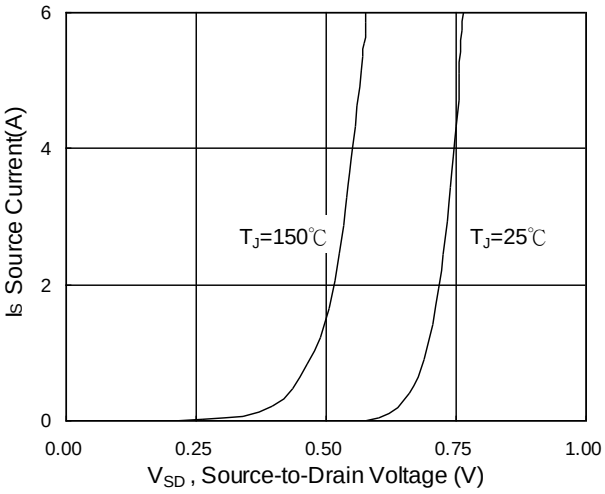


Fig.3 Forward Characteristics of Reverse

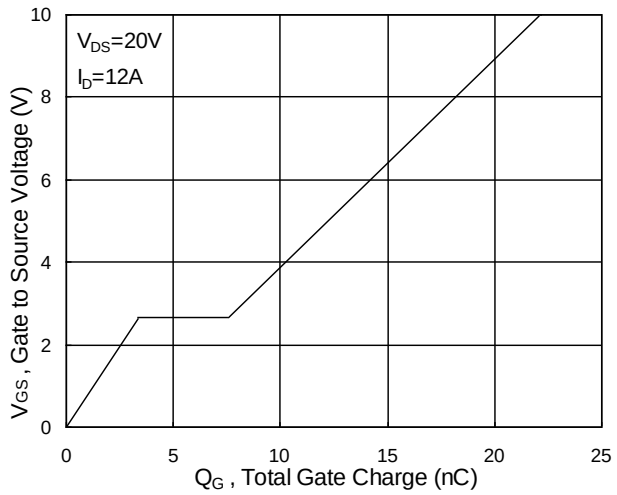


Fig.4 Gate-Charge Characteristics

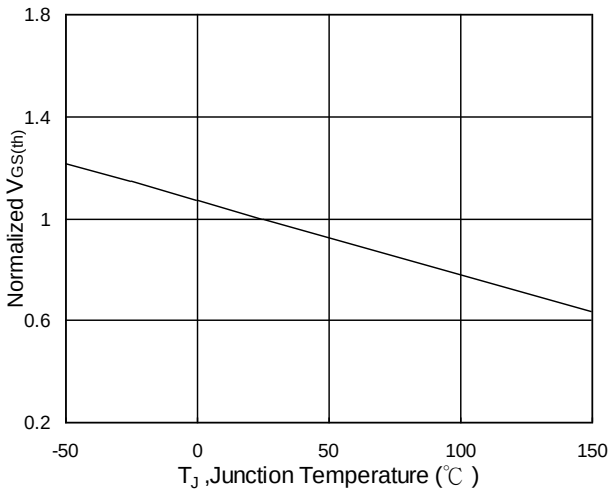


Fig.5 $V_{GS(th)}$ vs. T_J

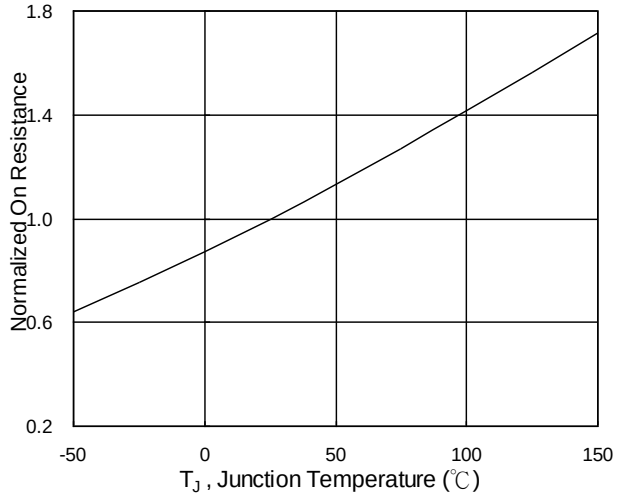


Fig.6 Normalized R_{DSON} vs. T_J

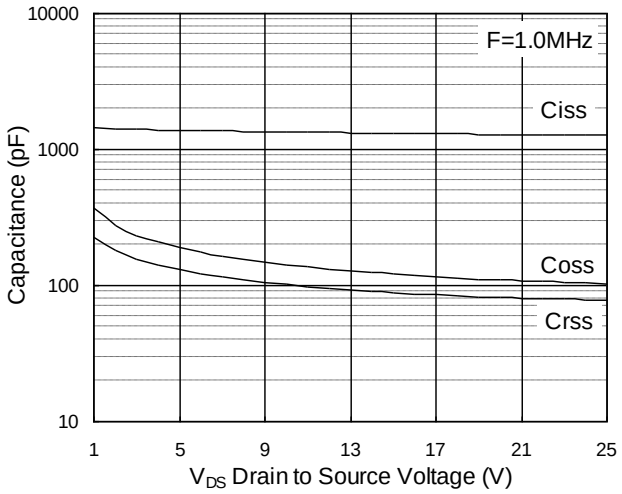


Fig.7 Capacitance

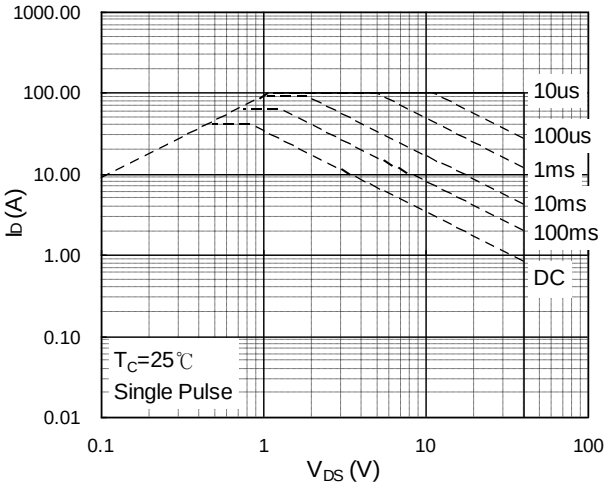


Fig.8 Safe Operating Area

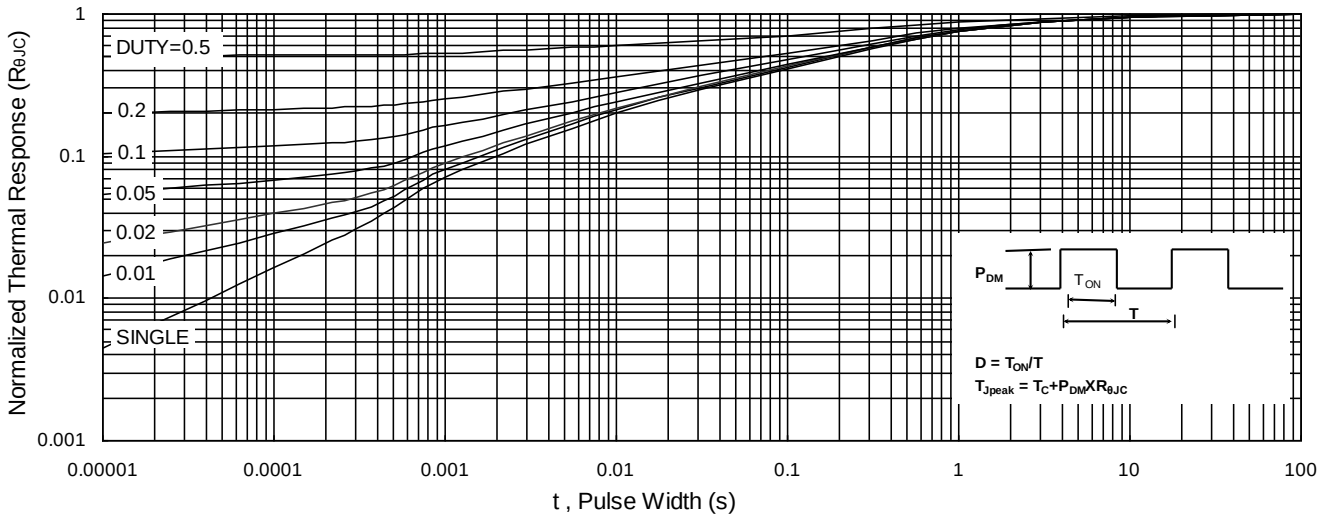


Fig.9 Normalized Maximum Transient Thermal Impedance

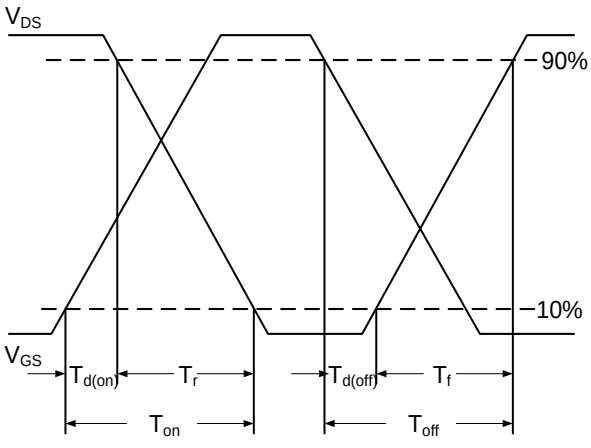


Fig.10 Switching Time Waveform

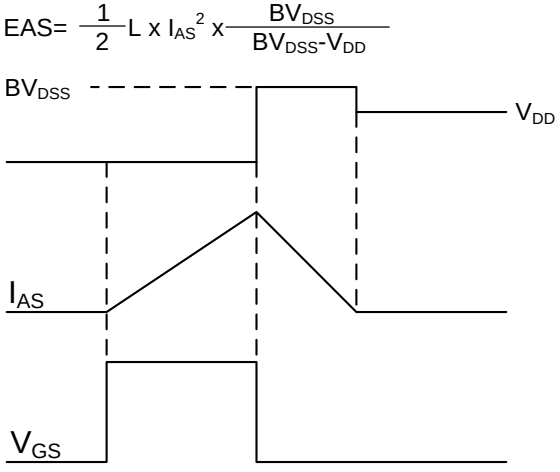
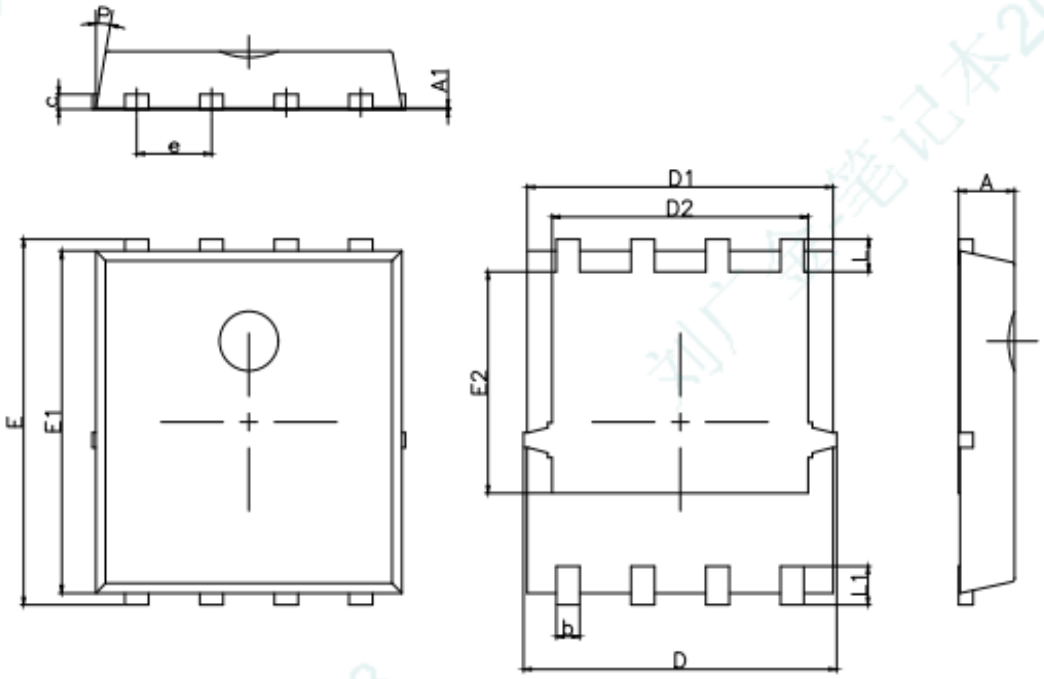


Fig.11 Unclamped Inductive Switching Waveform

Package Mechanical Data-PDFN5*6-8L



DIM.	MILLIMETER		
	MIN.	TYP.	MAX.
A	0.9	0.95	1.2
A1	0	0.025	0.05
b	0.26	0.4	0.54
c	0.15	0.25	0.35
D	5.0	5.3	5.45
D1	4.95	5.15	5.35
D2	4.0	4.35	4.5
E	6.05	6.15	6.25
E1	5.7	5.75	6.1
E2	3.4	3.7	3.8
e	1.27		
L	0.45	0.55	0.65
L1	0.45	0.6	0.7
P	8°	10°	12°