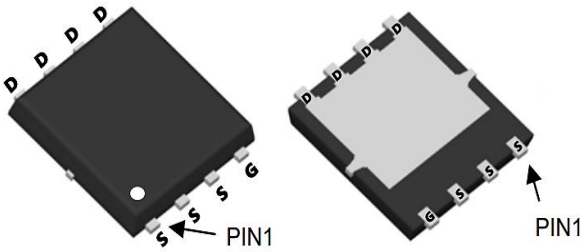
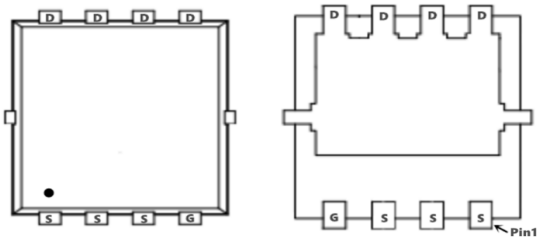
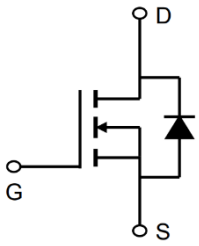
60V N-Channel Enhancement Mode MOSFET

PDFN5*6-8L







General Features

V_{DS} = 60V I_D =50A

$R_{DS(ON)}$ <16.5mΩ @ V_{GS}=10V **(Type：14mΩ)**

Application

Battery protection

Load switch

Uninterruptible power supply

Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
CTK50N06DF5	PDFN5X6-8L	CTK50N06DF5	5000

Absolute Maximum Ratings@T_j=25°C(unless otherwise specified)

Symbol	Parameter	Rating	Units
VDS	Drain-Source Voltage	60	V
VGS	Gate-Source Voltage	±20	V
I_D@T_C=25℃	Continuous Drain Current, V_{GS} @ 10V[1]	50	A
I_D@T_C=100℃	Continuous Drain Current, V_{GS} @ 10V[1]	22	A
IDM	Pulsed Drain Current[2]	150	A
EAS	Single Pulse Avalanche Energy[3]	78	mJ
IAS	Avalanche Current	29	A
P_D@T_C=25℃	Total Power Dissipation[4]	45	W
TSTG	Storage Temperature Range	-55 to 150	℃
T_J	Operating Junction Temperature Range	-55 to 150	℃
$R_{\theta}JA$	Thermal Resistance Junction-Ambient [1]	25	℃/W
$R_{\theta}JC$	Thermal Resistance Junction-Case[1]	2.8	℃/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	60	68	---	V
△BVDSS/△TJ	BV_{DSS} Temperature Coefficient	Reference to 25℃ , I_D=1mA	---	0.057	---	V/℃
RDS(ON)	Static Drain-Source On-Resistance[2]	V_{GS}=10V , I_D=20A	---	14	16.5	mΩ
		V_{GS}=4.5V , I_D=10A	---	17	21	
VGS(th)	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D =250uA	1.2	1.6	2.0	V
$\triangle V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient		---	-5.68	---	mV/℃
IDSS	Drain-Source Leakage Current	V_{DS}=60V , V_{GS}=0V , T_J=25℃	---	---	1	uA
		V_{DS}=60V , 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=15A	---	45	---	S
R_g	Gate Resistance	V_{DS}=0V , V_{GS}=0V , f=1MHz	---	2	---	Ω
Q_g	Total Gate Charge (4.5V)	V_{DS}=48V , V_{GS}=4.5V , I_D=15A	---	28	---	nC
Q_{gs}	Gate-Source Charge		---	3.5	---	
Q_{gd}	Gate-Drain Charge		---	6.4	---	
Td(on)	Turn-On Delay Time	V_{DD}=30V , V_{GS}=10V , R_G=3.3 , I_D=15A	---	7.2	---	ns
T_r	Rise Time		---	38	---	
Td(off)	Turn-Off Delay Time		---	34	---	
T_f	Fall Time		---	8.2	---	
C_{iss}	Input Capacitance	V_{DS}=15V , V_{GS}=0V , f=1MHz	---	2309	---	pF
Coss	Output Capacitance		---	112	---	
Crss	Reverse Transfer Capacitance		---	82	---	
I_S	Continuous Source Current[1,5]	V_G=V_D=0V , Force Current	---	---	30	A
ISM	Pulsed Source Current[2,5]		---	---	152	A
VSD	Diode Forward Voltage[2]	V_{GS}=0V , I_S=A , T_J=25℃	---	---	1	V
t_{rr}	Reverse Recovery Time	IF=15A , dI/dt=100A/μs , T_J=25℃	---	19.6	---	nS
Q_{rr}	Reverse Recovery Charge		---	14.2	---	nC

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 .The EAS data shows Max. rating .

3、The test cond≦ 300us duty cycle ≦ 2%, duty cycle ition is TJ =25℃, VDD =48V, VG =10V, RG =25Ω, L=0.1mH, IAS =29A

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

5、The data is theoretically the same as ID and IDM , in real applications , should be limited by total power dissipation.

Typical Characteristics

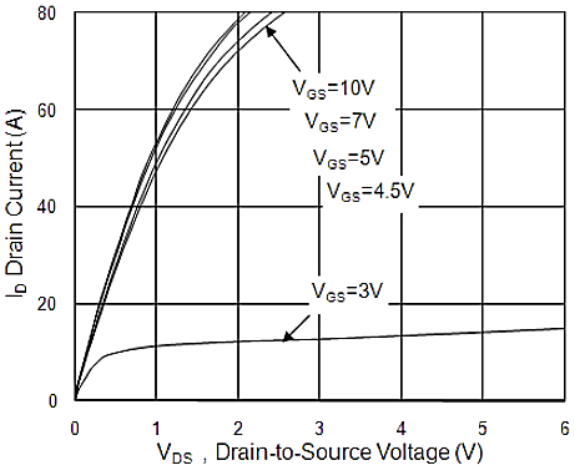


Fig.1 Typical Output Characteristics

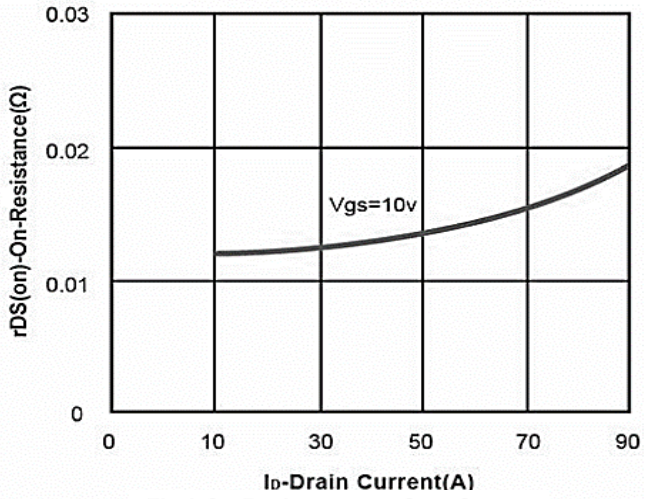


Fig.2 On-Resistance v.s Gate-Source

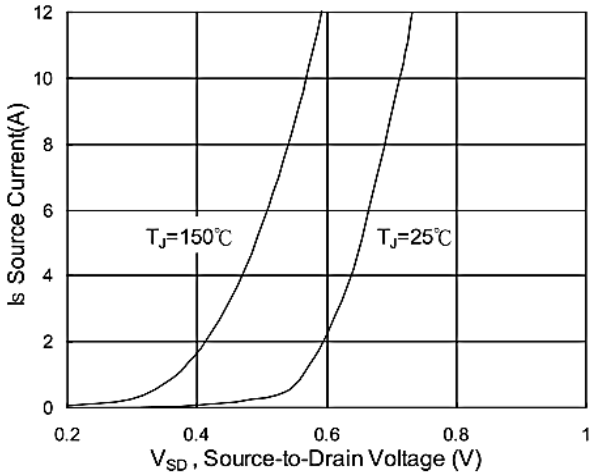


Fig.3 Forward Characteristics of Reverse

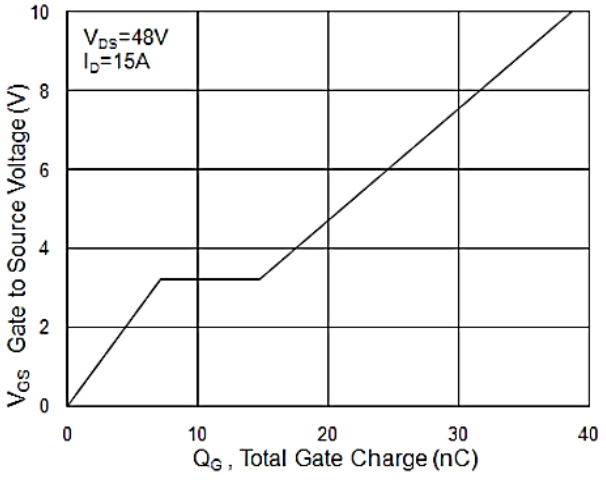


Fig.4 Gate-Charge Characteristics

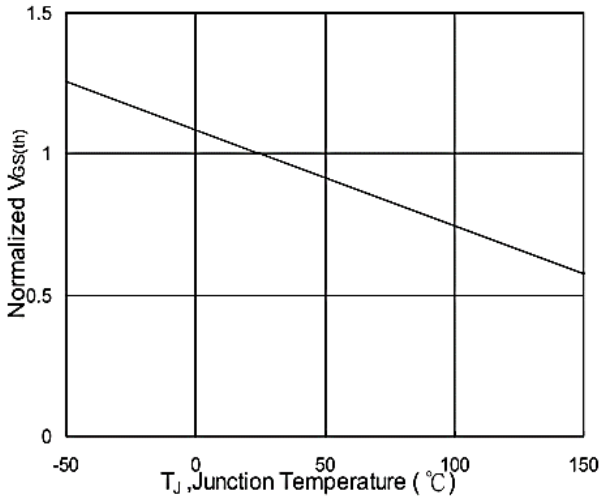


Fig.5 Normalized V_{GS} v.s T_J

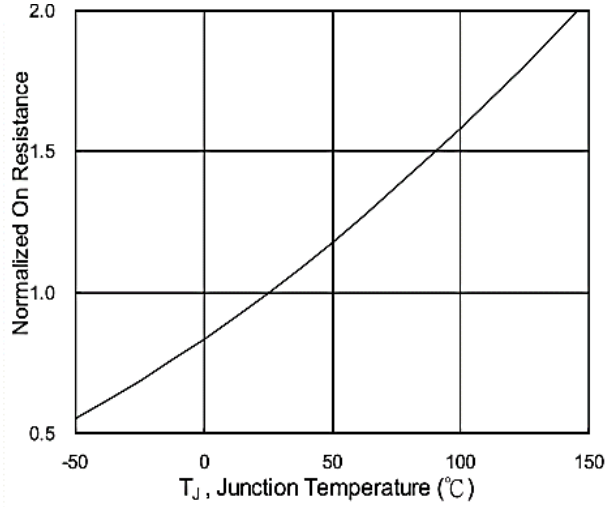


Fig.6 Normalized R_{DSON} v.s T_J

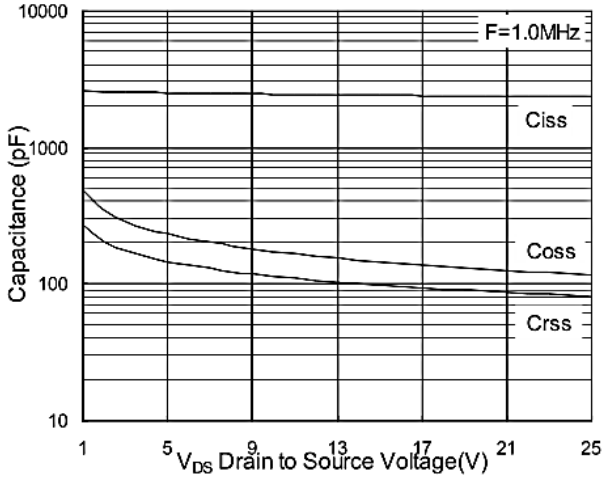


Fig.7 Capacitance

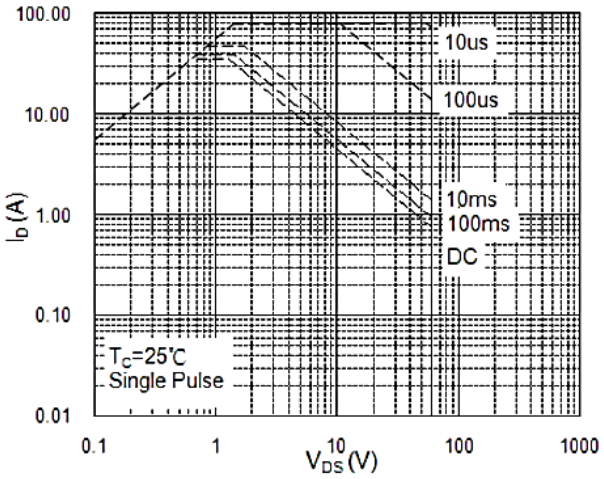


Fig.8 Safe Operating Area

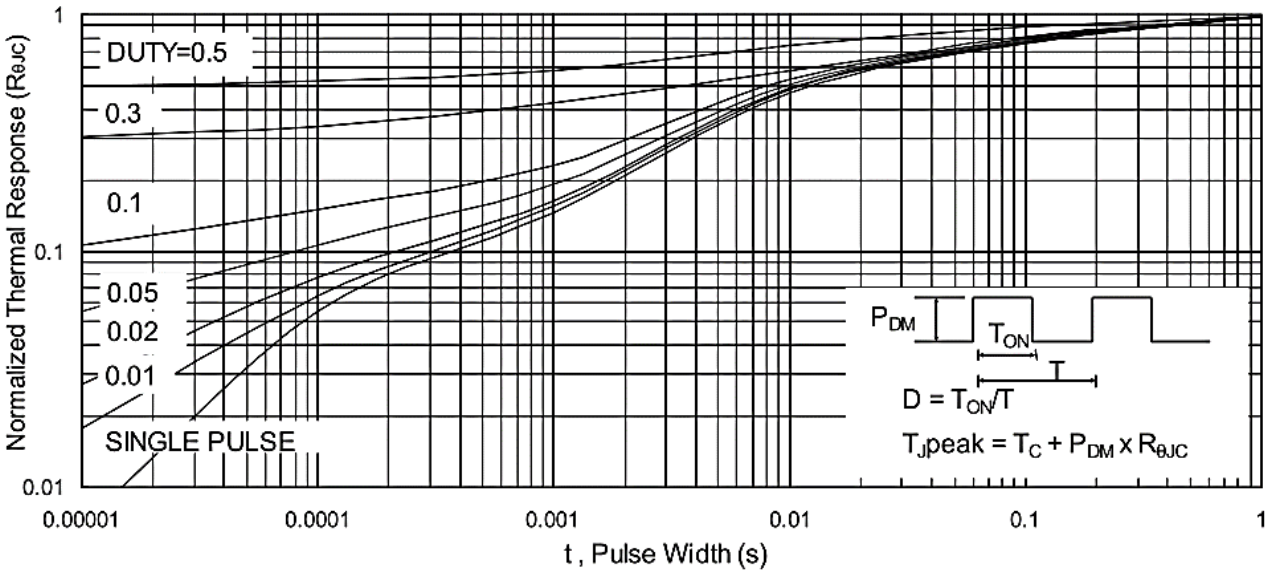


Fig.9 Normalized Maximum Transient Thermal Impedance

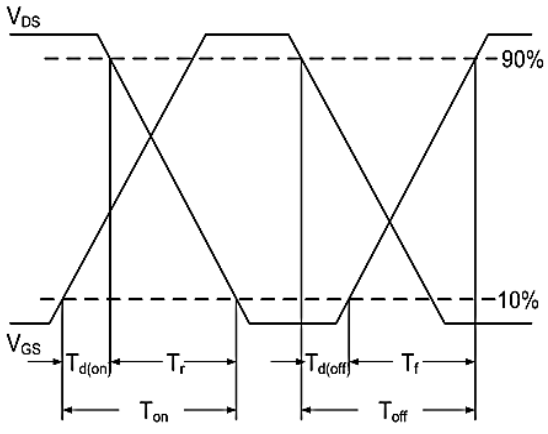


Fig.10 Switching Time Waveform

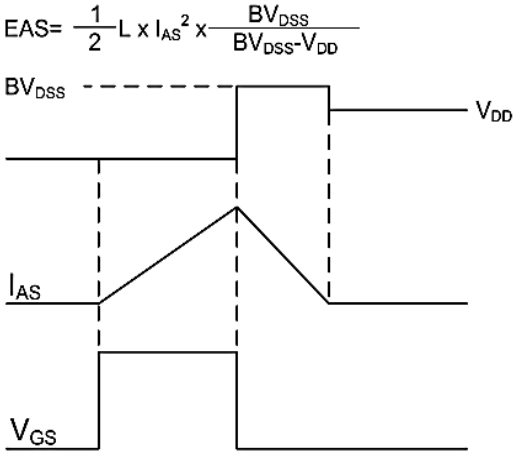
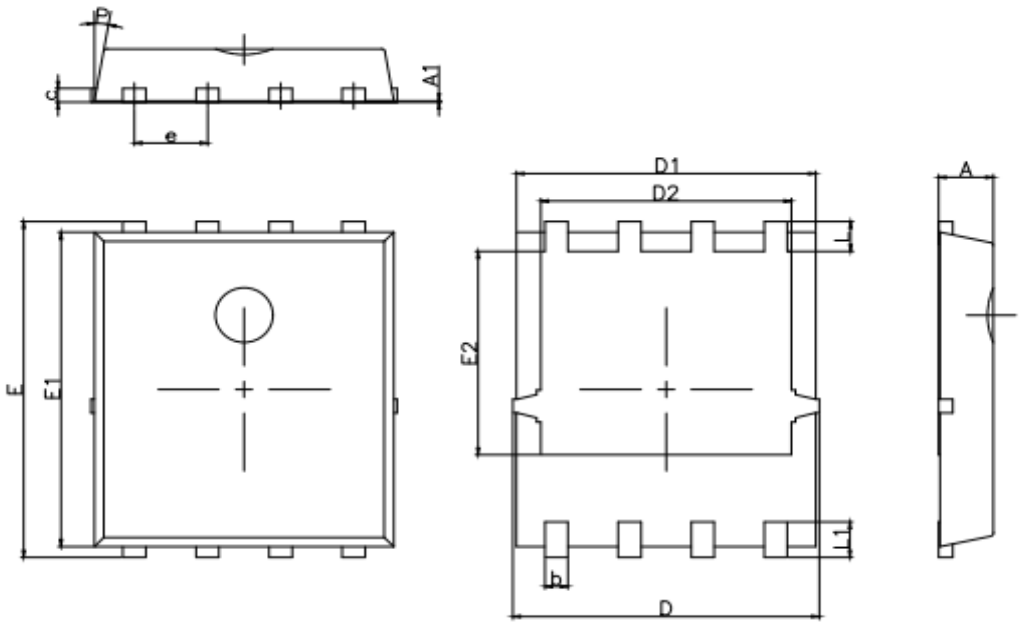


Fig.11 Unclamped Inductive Switching Waveform

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°