

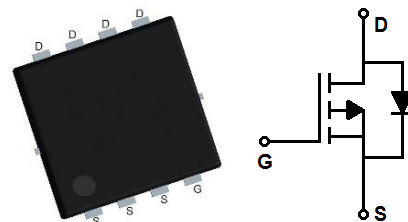
Features

- Low $R_{DS(on)}$ @ $V_{GS} = -4.5V$
- -2.5V Logic Level Control
- 100% UIS Tested
- Pb-Free, RoHS Compliant

$V_{(BR)DSS}$	$R_{DS(on)}$ Typ	I_D Max
-20V	6.5mΩ @ -4.5V	-50A
	8.5mΩ @ -2.5V	

Applications

- In PWM Applications
- Load Switch
- Notebook Adapter Switch



PDFN3X3

Order Information

PO Par ID	Package	Marking	Packing
CT6R5P02L	PDFN3X3	008P02	5000PCS/ Reel

Absolute Maximum Ratings

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

Symbol	Parameter	Rating	Unit	
Common Ratings (TA =25°C Unless Otherwise Noted)				
V _{GS}	Gate-Source Voltage	±12	V	
V _{(BR)DSS}	Drain-Source Breakdown Voltage	-20	V	
T _J	Maximum Junction Temperature	150	°C	
T _{STG}	Storage Temperature Range	-50 to 150	°C	
Mounted on Large Heat Sink				
I _{DM}	Pulse Drain Current Tested①	T _C =25°C	-100	A
I _D	Continuous Drain Current	T _C =25°C	-50	A
		T _C =70°C	-40	
P _D	Maximum Power Dissipation	T _C =25°C	62.5	W
		T _C =25°C	50	
EAS	Avalanche energy, single pulsed ②		20	mJ
R _{JC}	Thermal Resistance-Junction to Case		2.5	°C/W

Symbol	Parameter	Condition	Min	Typ	Max	Unit
Static Electrical Characteristics @ T _J = 25°C (unless otherwise stated)						
V _{(BR)DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V I _D =-250μA	-20	—	—	V
I _{DSS}	Zero Gate Voltage Drain Current(T _C = 25°C)	V _{DS} =-20V, V _{GS} =0V	—	—	-1	μA
	Zero Gate Voltage Drain Current(T _C =125°C)	V _{DS} =-16V, V _{GS} =0V	—	—	-100	uA
I _{GSS}	Gate-Body Leakage Current	V _{GS} =±12V, V _{DS} =0V	—	—	±100	nA
V _{GS(TH)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =-250μA	-0.4	-0.6	-1.0	V
R _{DS(ON)}	Drain-Source On-State Resistance③	V _{GS} =-4.5V, I _D =-20A	—	6.5	8	mΩ
R _{DS(ON)}	Drain-Source On-State Resistance③	V _{GS} =-3.3V, I _D =-15A	—	7	9	mΩ
R _{DS(ON)}	Drain-Source On-State Resistance③	V _{GS} =-2.5V, I _D =-10A	—	8.5	11	mΩ
Dynamic Electrical Characteristics @ T _J = 25°C (unless otherwise stated)						
C _{iss}	Input Capacitance	V _{DS} =-10V, V _{GS} =0V, f=1MHz	—	4470	—	pF
C _{oss}	Output Capacitance		—	595	—	pF
C _{rss}	Reverse Transfer Capacitance		—	539	—	pF
R _g	Gate Resistance	f=1MHz		9.2		Ω
Q _g	Total Gate Charge	V _{DS} =-10V I _D =-20A, V _{GS} =-4.5V	—	44.5	—	nC
Q _{gs}	Gate Source Charge		—	7.2	—	nC
Q _{gd}	Gate Drain Charge		—	10.2	—	nC
Switching Characteristics @ T _J = 25°C (unless otherwise stated)						
t _{d(on)}	Turn on Delay Time	V _{DD} =-10V, I _D =-3A, R _G =6Ω, V _{GS} =-4.5V	—	21	—	ns
t _r	Turn on Rise Time		—	46.4	—	ns
t _{d(off)}	Turn Off Delay Time		-	236	—	ns
t _f	Turn Off Fall Time		—	112	—	ns
Source Drain Diode Characteristics						
V _{SD}	Forward on voltage③	T _j =25°C, I _{SD} =-20A, V _{GS} =0V	—	-0.81	-1.2	V

Notes: ① Pulse width limited by maximum allowable junction temperature, Limited by Bonding wires.

② Limited by T_{Jmax}, starting T_J = 25°C, L = 0.1mH, R_G = 25Ω, I_{AS} = 20A, V_{GS} = 10V. Part not recommended for use above this value

③ Pulse width ≤ 300μs; duty cycle ≤ 2%.

Typical Characteristics

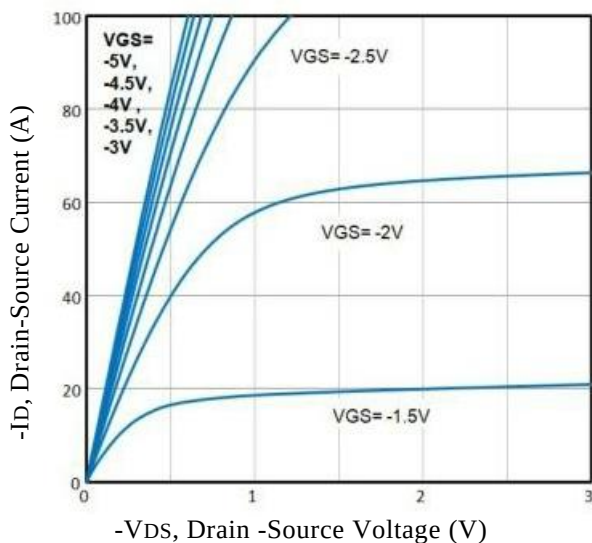


Fig1. Typical Output Characteristics

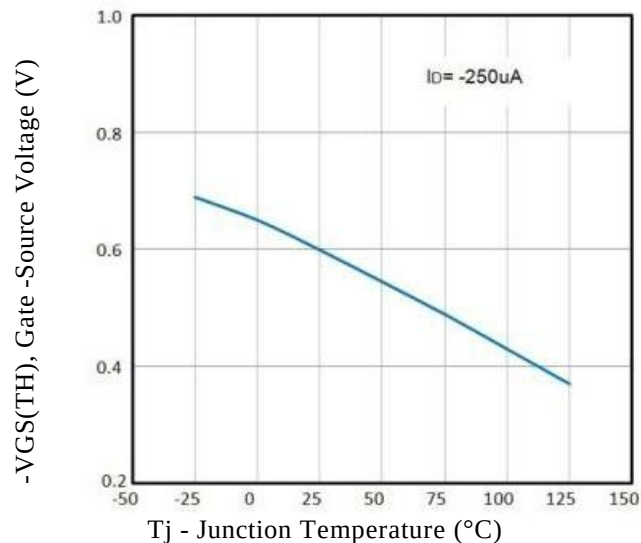


Fig2. Normalized Threshold Voltage Vs. Temperature

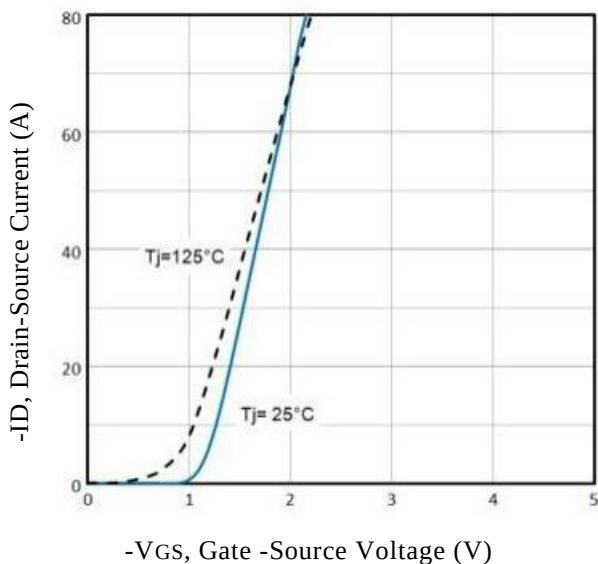


Fig3. Typical Transfer Characteristics

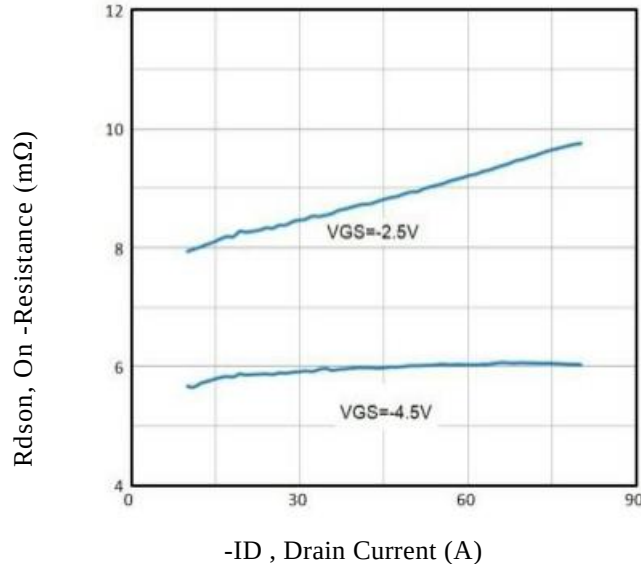


Fig4. On-Resistance vs. Drain Current and Gate

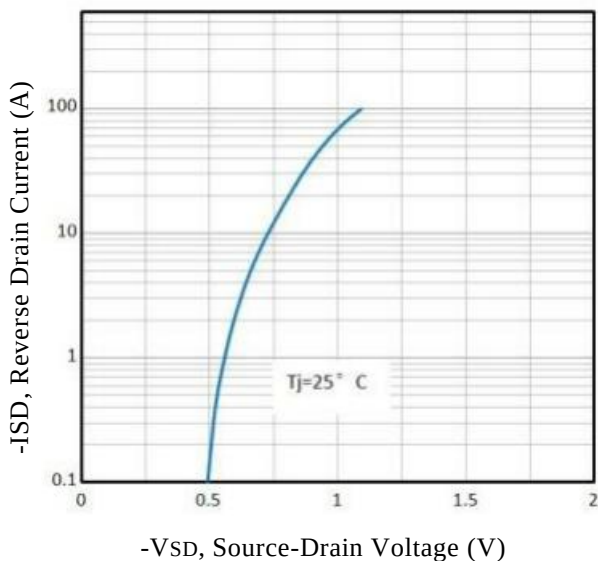


Fig5. Typical Source-Drain Diode Forward Voltage

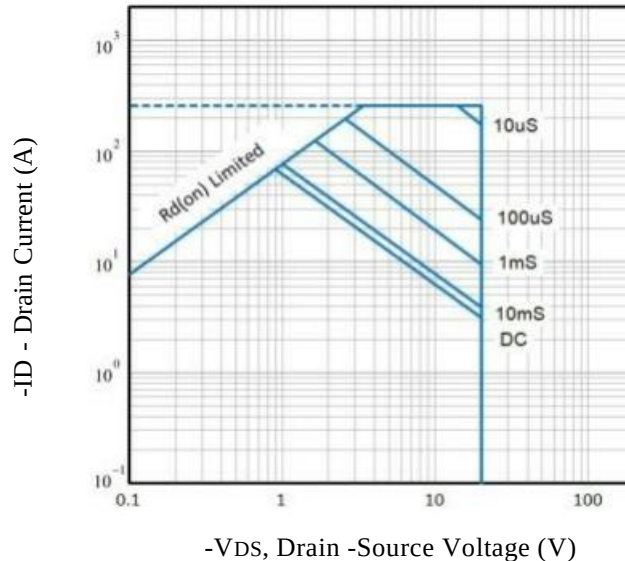
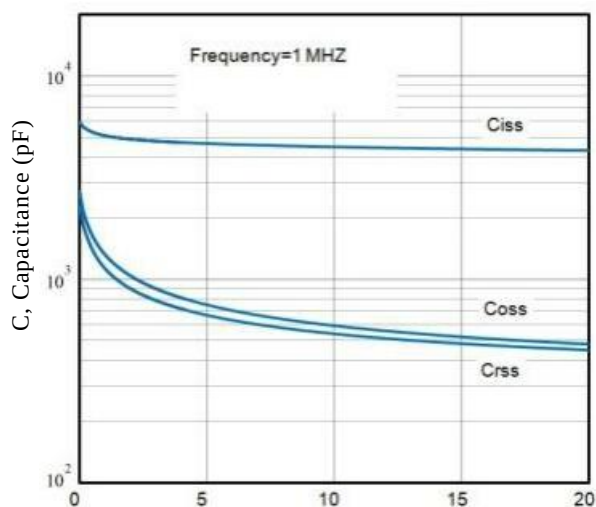


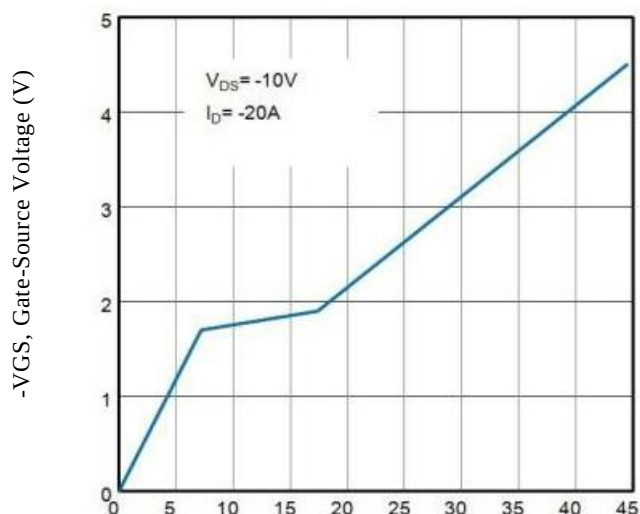
Fig6. Maximum Safe Operating Area

Typical Characteristics



-VDS, Drain-Source Voltage (V)

Fig7. Typical Capacitance Vs. Drain-Source Voltage



Qg, Total Gate Charge (nC)

Fig8. Typical Gate Charge Vs. Gate-Source Voltage

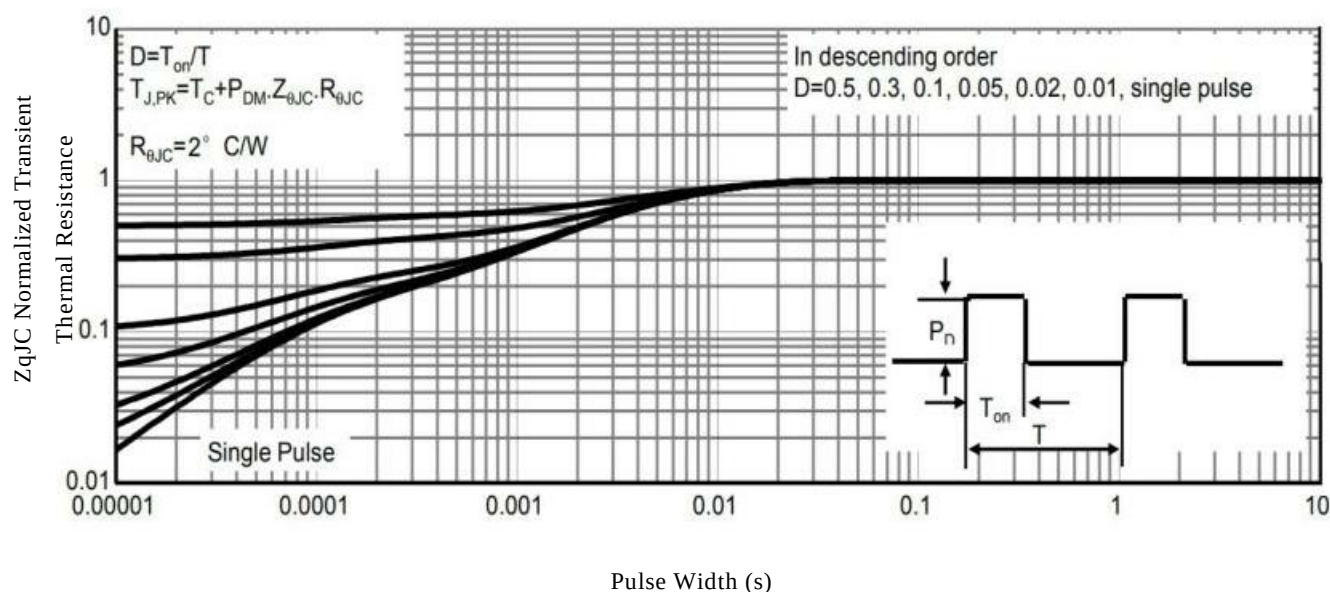


Fig9. Normalized Maximum Transient Thermal Impedance

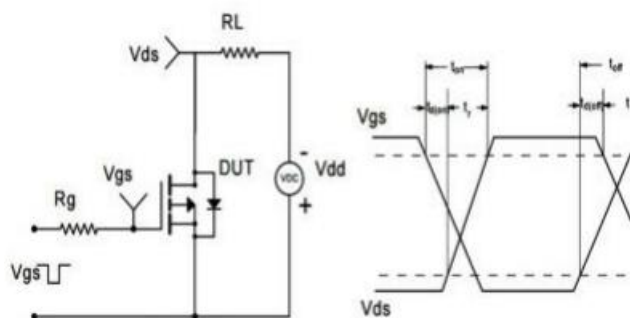


Fig10. Switching Time Test Circuit and waveforms

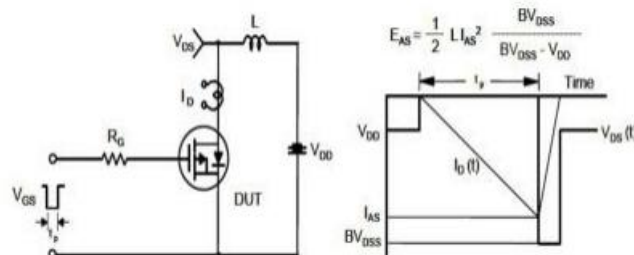
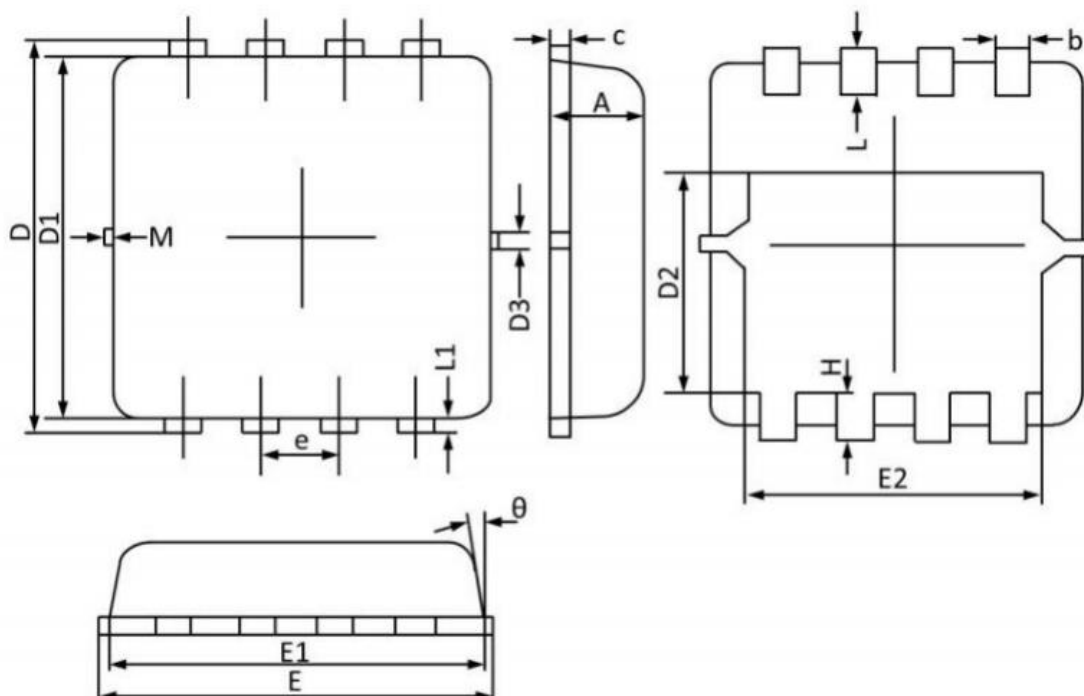


Fig11. Unclamped Inductive Test Circuit and waveforms

PDFN3X3 Mechanical Data


DIMENSIONS (unit : mm)

Symbol	Min	Typ	Max	Symbol	Min	Typ	Max
A	0.70	0.75	0.80	b	0.25	0.30	0.35
c	0.10	0.15	0.25	D	3.25	3.35	3.45
D1	3.00	3.10	3.20	D2	1.78	1.88	1.98
D3	—	0.13	—	E	3.20	3.30	3.40
E1	3.00	3.15	3.20	E2	2.39	2.49	2.59
e	0.65BSC			H	0.30	0.39	0.50
L	0.30	0.40	0.50	L1	—	0.13	—
θ	—	10°	12°	M	*	*	0.15

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