

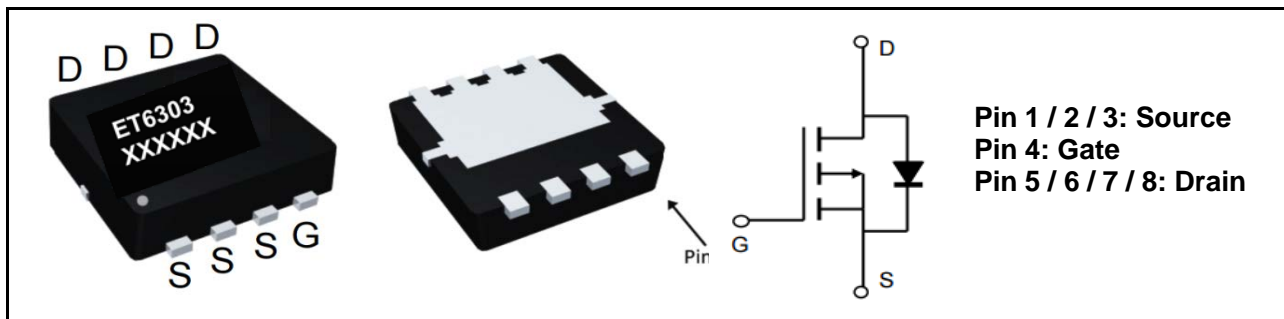
P-Channel Enhancement-Mode MOSFET (-30V, -47A)

PRODUCT SUMMARY

V_{DSS}	I_D	$R_{DS(on)}$ (m Ω) Typ.
-30V	-47A	8.5 @ $V_{GS} = 10V, I_D=20A$
		15 @ $V_{GS} = 4.5V, I_D=10A$

Features

- Super high density cell design for extremely low RDS(ON)
- Exceptional on-resistance and maximum DC current capability
- Fast Switching
- Lead (Pb) -free and halogen-free



Absolute Maximum Ratings ($T_A=25^\circ C$, unless otherwise noted)

Symbol	Parameter	Ratings	Units
V_{DS}	Drain-Source Voltage	-30	V
V_{GS}	Gate-Source Voltage	± 20	V
I_D	Drain Current (Continuous) @ $T_A=25^\circ C$	-47	A
	Drain Current (Continuous) @ $T_A=75^\circ C$	-30	A
I_{DM}	Drain Current (Pulsed) ^a	-188	A
P_D	Total Power Dissipation @ $T_A=25^\circ C$	38	W
	Total Power Dissipation @ $T_A=75^\circ C$	22	W
I_S	Maximum Diode Forward Current	-47	A
T_j, T_{stg}	Operating Junction and Storage Temperature Range	-55 to +150	$^\circ C$
R_{QJA}	Thermal Resistance Junction to Ambient (PCB mounted) ^b	35	$^\circ C/W$

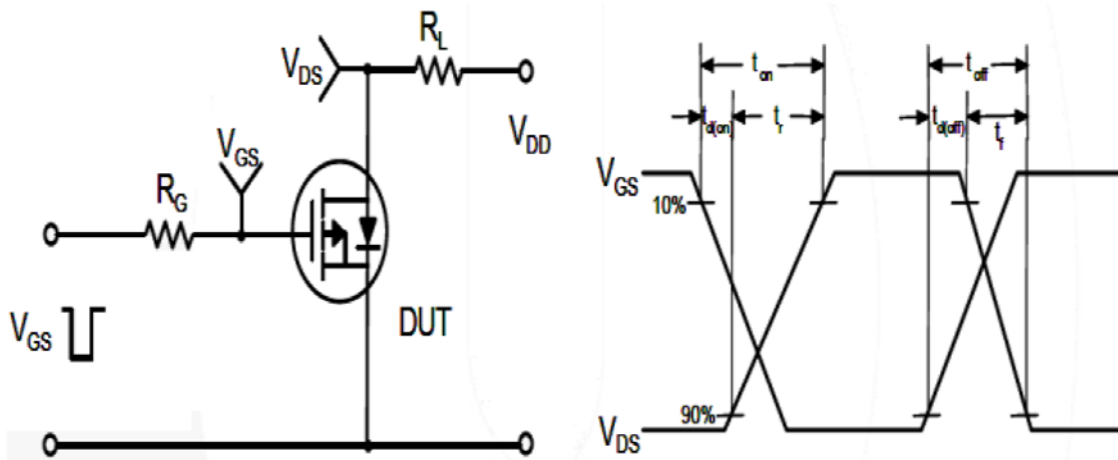
a: Repetitive Rating: Pulse width limited by the maximum junction temperature.

b: 1-in² 2oz Cu PCB board

Electrical Characteristics ($T_A=25^\circ\text{C}$, unless otherwise noted)

Symbol	Characteristic	Test Conditions	Min.	Typ.	Max.	Unit
• Off Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=-250\mu A$	-30	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=30V, V_{GS}=0V$	-	-	1	μA
I_{GSS}	Gate-Body Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	± 100	nA
• On Characteristics						
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	-1.0	-1.8	-2.5	V
$R_{DS(on)}$	Drain-Source On-State Resistance	$V_{GS}=-10V, I_D=-20A$	-	8.5	11	m Ω
		$V_{GS}=-4.5V, I_D=-16A$	-	15	20	
• Dynamic Characteristics						
C_{iss}	Input Capacitance	$V_{DS}=-15V, V_{GS}=0V, f=1\text{MHz}$	-	3320	-	PF
C_{oss}	Output Capacitance		-	395	-	
C_{rss}	Reverse Transfer Capacitance		-	245	-	
• Switching Characteristics						
Q_g	Total Gate Charge	$V_{DS}=-15V, I_D=20A, V_{GS}=-10V$	-	39	-	nC
Q_{gs}	Gate-Source Charge		-	7	-	
Q_{gd}	Gate-Drain Charge		-	11	-	
$t_{d(on)}$	Turn-on Delay Time	$V_{DD}=15V, R_L=15\Omega, I_D=20A, V_{GEN}=10V, R_G=6\Omega$	-	15	-	nS
t_r	Turn-on Rise Time		-	33	-	
$t_{d(off)}$	Turn-off Delay Time		-	67	-	
t_f	Turn-off Fall Time		-	21	-	
• Drain-Source Diode Characteristics						
V_{SD}	Drain-Source Diode Forward	$V_{GS}=0V, I_S=20A$	-	-	-1.2	V

Note: Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$



Switching Time Test Circuit and waveforms

Typical Characteristics Curves (Ta=25°C, unless otherwise note)

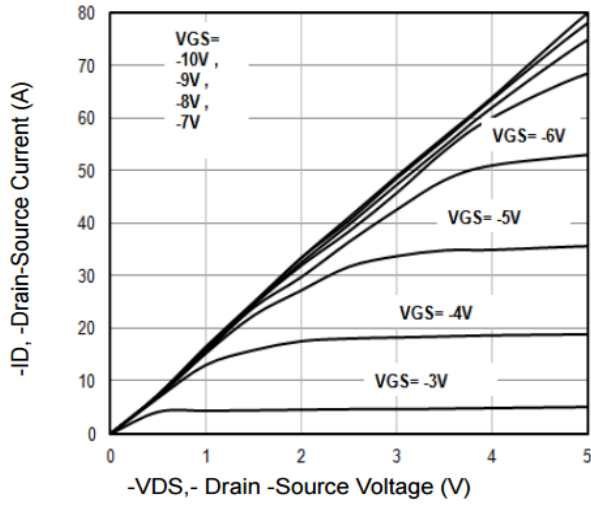


Fig1. Typical Output Characteristics

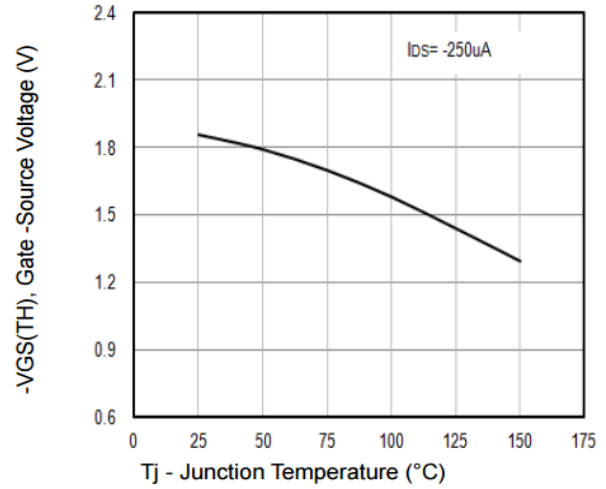


Fig2. $-V_{GS(TH)}$ Gate -Source Voltage Vs. T_j

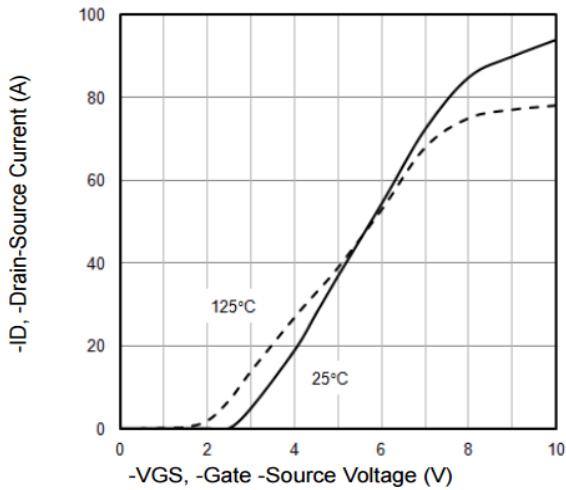


Fig3. Typical Transfer Characteristics

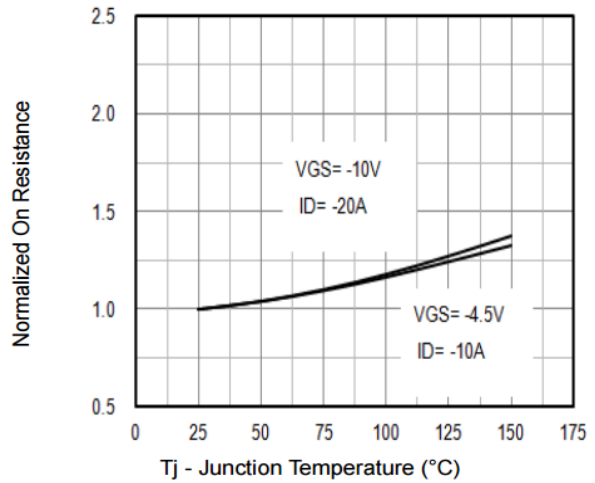


Fig4. Normalized On-Resistance Vs. T_j

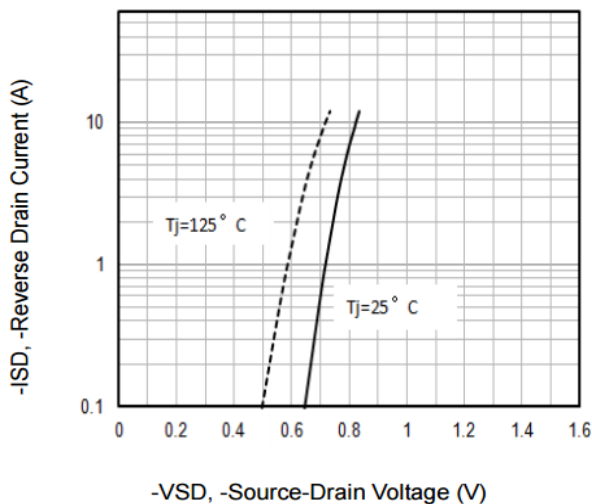


Fig5. Typical Source-Drain Diode Forward Voltage

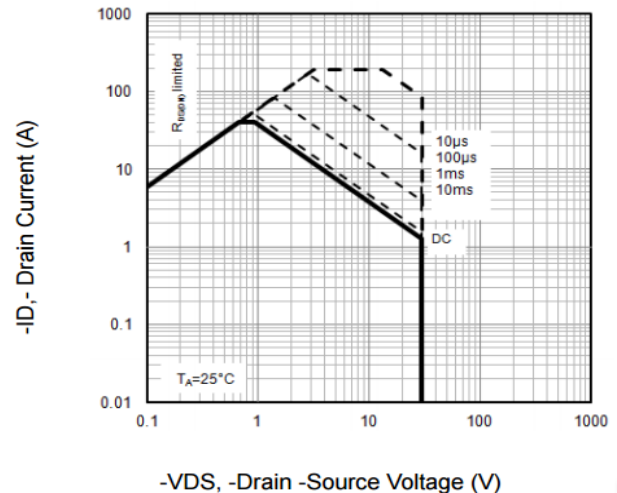


Fig6. Maximum Safe Operating Area

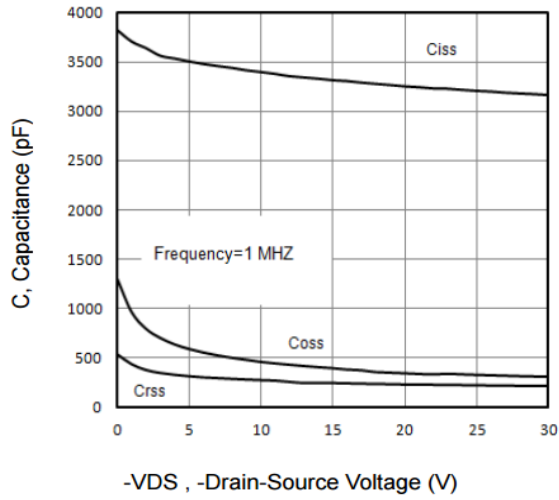


Fig7. Typical Capacitance Vs. Drain-Source Voltage

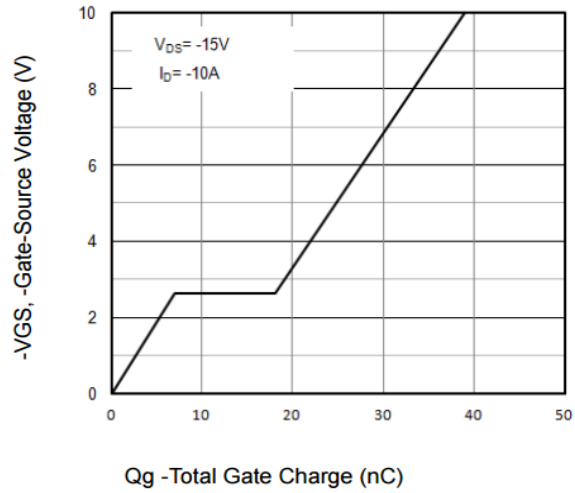


Fig8. Typical Gate Charge Vs. Gate-Source Voltage

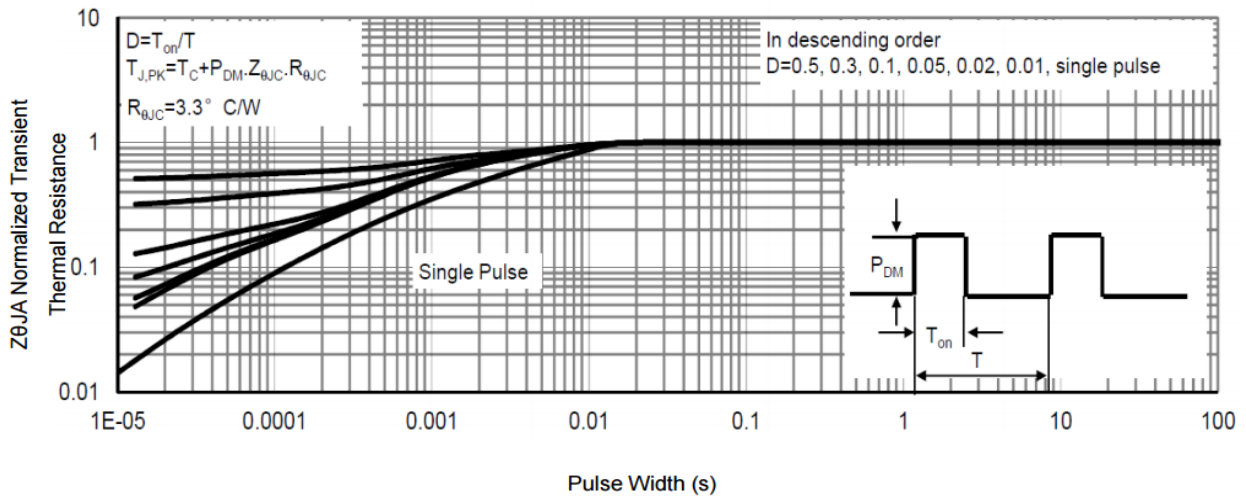
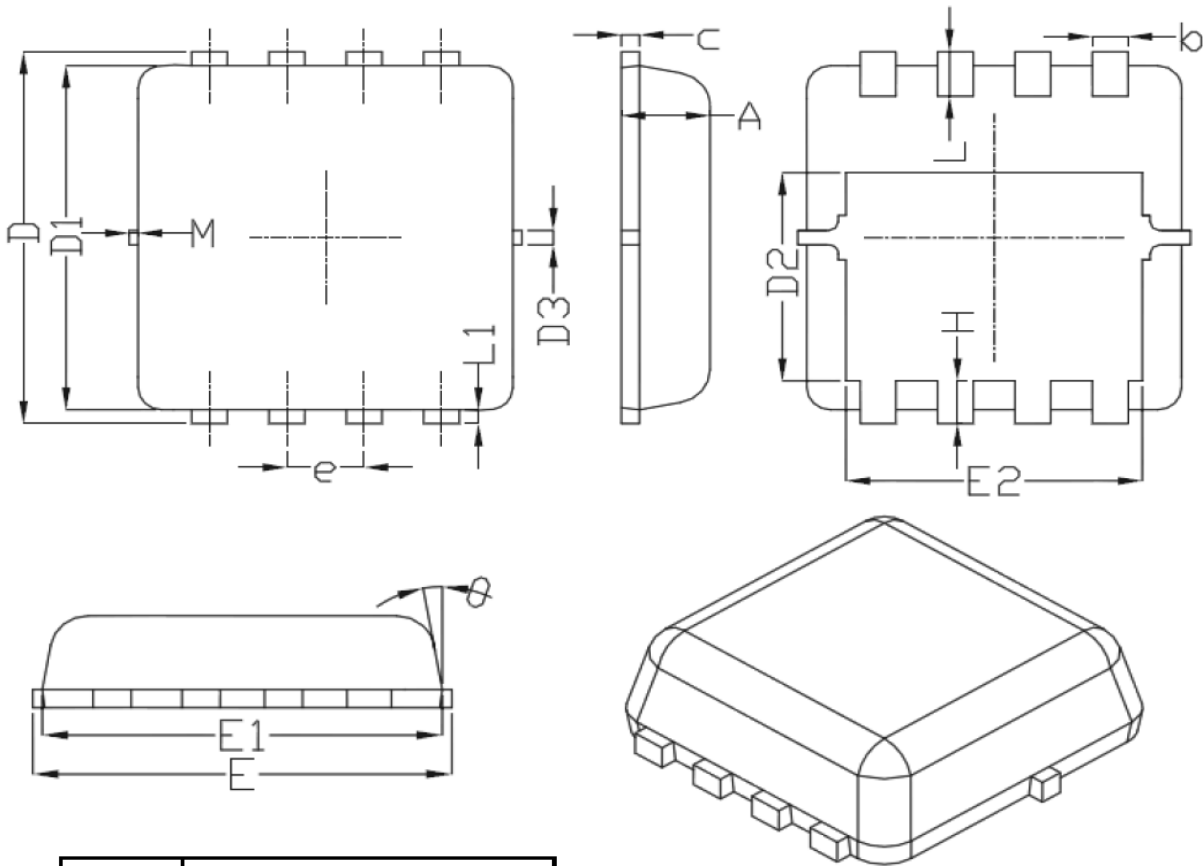


Fig9. Normalized Maximum Transient Thermal Impedance

PDFN3333 PACKAGE OUTLINE DIMENSIONS



Symbol	DIMENSIONS (unit : mm)		
	Min	Typ	Max
A	0.7	0.75	0.8
b	0.25	0.3	0.35
C	0.1	0.15	0.25
D	3.25	3.35	3.45
D1	3	3.1	3.2
D2	1.78	1.88	1.98
D3	--	0.13	--
E	3.2	3.3	3.4
E1	3	3.15	3.2
E2	2.39	2.49	2.59
e	0.65 BSC		
H	0.3	0.39	0.5
L	0.3	0.4	0.5
L1	--	0.13	--
θ	--	10°	12°
M	*	*	0.15