

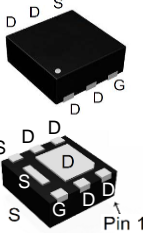
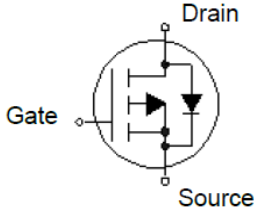
P-Channel Enhancement-Mode MOSFET (-20V, -8A)

PRODUCT SUMMARY

V_{DSS}	I_D	$R_{DS(on)}$ (m Ω) Typ.
-20V	-8A	22 @ $V_{GS} = -4.5V, I_D = -8A$
		29 @ $V_{GS} = -2.5V, I_D = -4.5A$
		45 @ $V_{GS} = -1.8V, I_D = -1.5A$

Features

- Super high dense cell trench design for low $R_{DS(on)}$
- Rugged and reliable
- DFN2*2-6L Package
- Lead (Pb) -free and halogen-free

	<p>ET2321 Pin Assignment & Symbol 6-Lead Plastic DFN2*2-6L Pin 1/2/5/6: Drain Pin 4: Source Pin 3: Gate</p>	
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Absolute Maximum Ratings ($T_A = 25^\circ\text{C}$, unless otherwise noted)

Symbol	Parameter	Ratings	Units
V_{DS}	Drain-Source Voltage	-20	V
V_{GS}	Gate-Source Voltage	± 12	V
I_D	Drain Current (Continuous)	-8	A
I_{DM}	Drain Current (Pulsed) ^a	-32	A
P_D	Total Power Dissipation @ $T_A = 25^\circ\text{C}$	2.5	W
I_S	Maximum Diode Forward Current	-1	A
T_j, T_{stg}	Operating Junction and Storage Temperature Range	-55 to +150	$^\circ\text{C}$
R_{QJA}	Thermal Resistance Junction to Ambient (PCB mounted) ^b	75	$^\circ\text{C/W}$

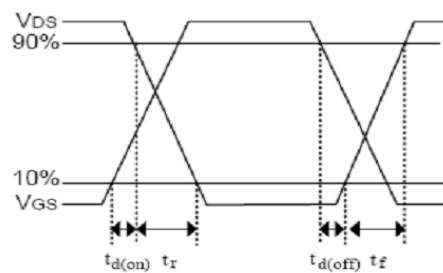
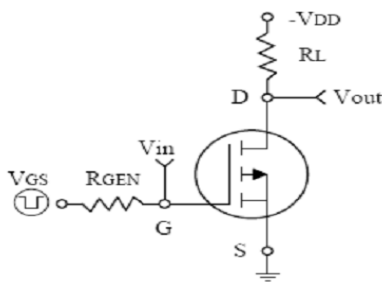
a: Repetitive Rating: Pulse width limited by the maximum junction temperature.

b: 1-in² 2oz Cu PCB board

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

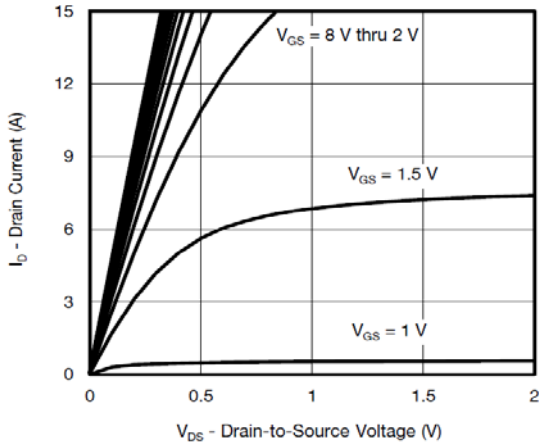
Symbol	Characteristic	Test Conditions	Min.	Typ.	Max.	Unit
• Off Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=-250\mu A$	-20	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=-20V, V_{GS}=0V$	-	-	1	μA
I_{GSS}	Gate-Body Leakage Current	$V_{GS}=\pm 12V, V_{DS}=0V$	-	-	± 100	nA
• On Characteristics						
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=-250\mu A$	-0.45	-0.65	-1	V
$R_{DS(on)}$	Drain-Source On-State Resistance	$V_{GS}=-4.5V, I_D=-8A$	-	22	28	m Ω
		$V_{GS}=-2.5V, I_D=-4.5A$	-	29	38	
		$V_{GS}=-1.8V, I_D=-1.5A$	-	45	56	
• Dynamic Characteristics						
C_{iss}	Input Capacitance	$V_{DS}=-10V, V_{GS}=0V, f=1\text{MHz}$	-	2100	-	PF
C_{oss}	Output Capacitance		-	497	-	
C_{rss}	Reverse Transfer Capacitance		-	289	-	
• Switching Characteristics						
Q_g	Total Gate Charge	$V_{DS}=-10V, I_D=-1A, V_{GS}=-10V$	-	18	-	nC
Q_{gs}	Gate-Source Charge		-	4.2	-	
Q_{gd}	Gate-Drain Charge		-	4.5	-	
$t_{d(on)}$	Turn-on Delay Time	$V_{DD}=-10V, R_L=15\Omega, I_D=1A, V_{GEN}=-4.5V, R_G=10\Omega$	-	25	-	nS
t_r	Turn-on Rise Time		-	33	-	
$t_{d(off)}$	Turn-off Delay Time		-	56	-	
t_f	Turn-off Fall Time		-	46	-	
• Drain-Source Diode Characteristics						
V_{SD}	Drain-Source Diode Forward	$V_{GS}=0V, I_S=-1A$	-	-	-1.2	V

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

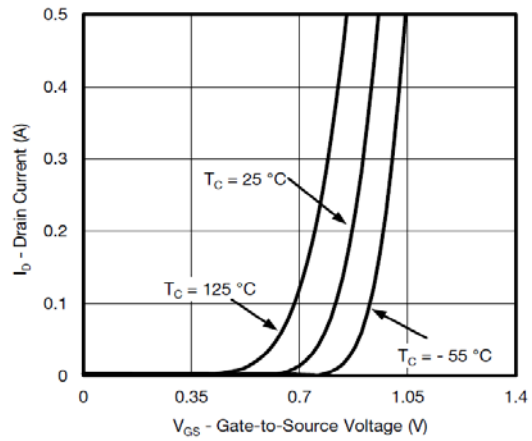


Switching Test Circuit and Switching Waveforms

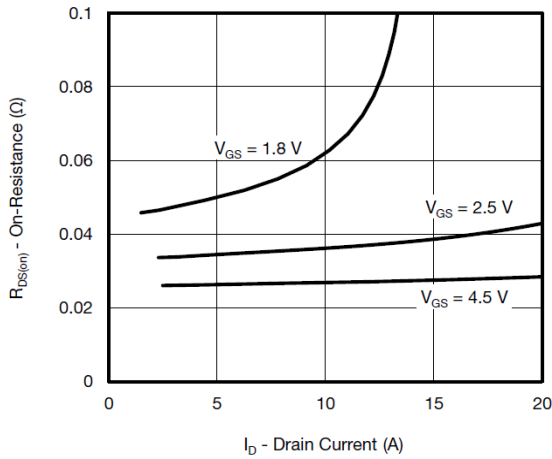
Typical Characteristics Curves (Ta=25°C, unless otherwise note)



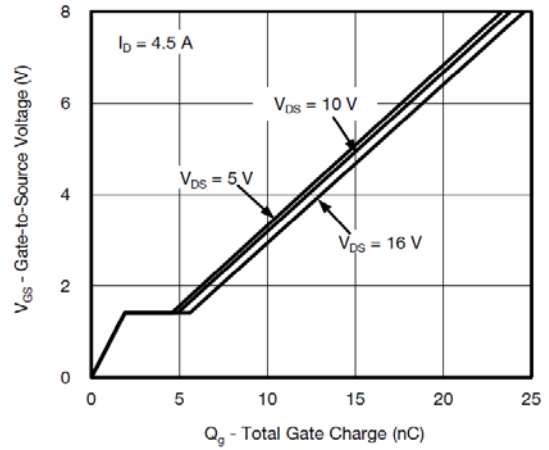
Output Characteristics



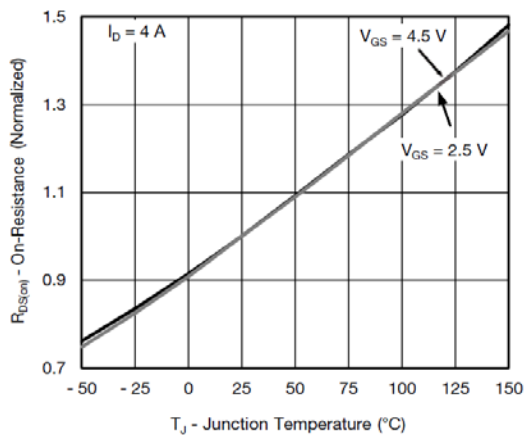
Transfer Characteristics



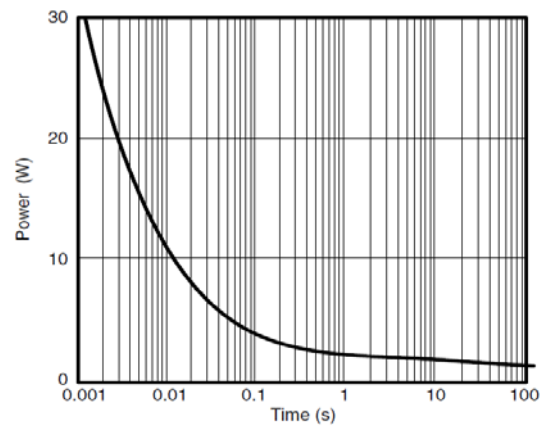
On-Resistance vs. Drain Current



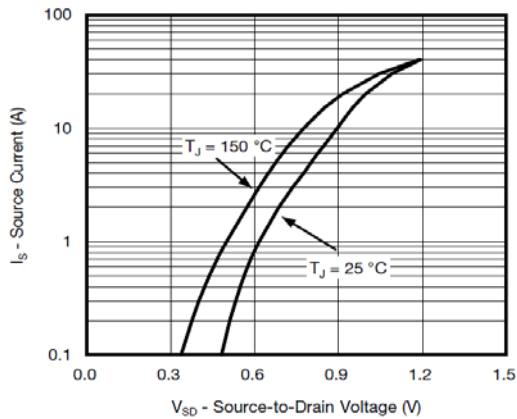
Gate Charge



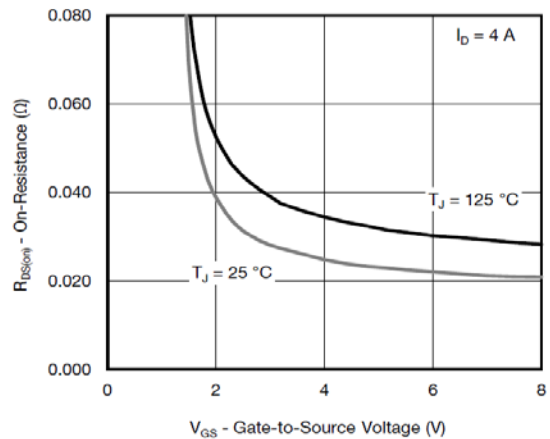
On-Resistance vs. Junction Temperature



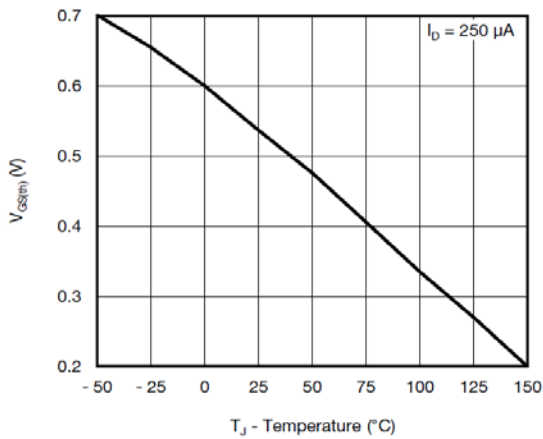
Single Pulse Power, Junction-to-Ambient



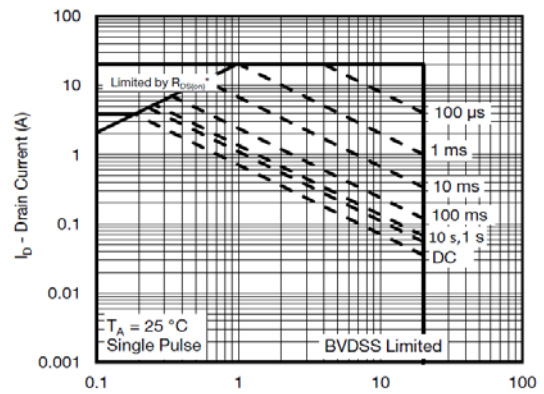
Source-Drain Diode Forward Voltage



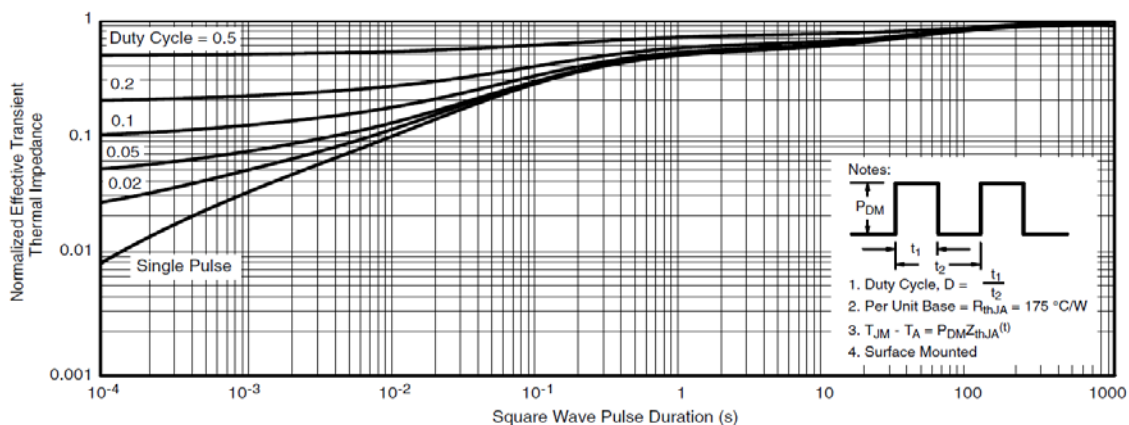
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage



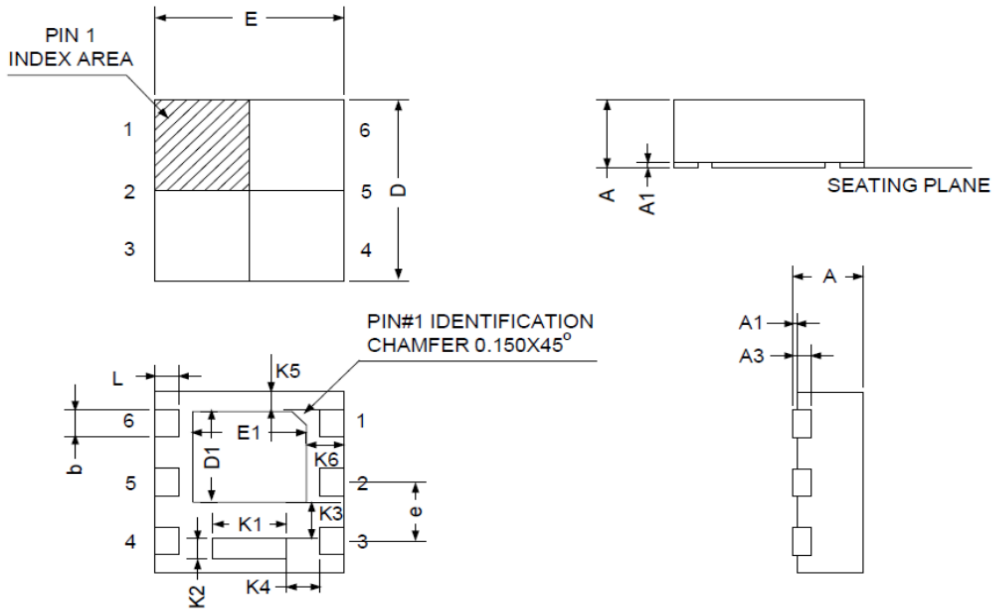
Safe Operating Area, Junction-to-Ambient



Normalized Thermal Transient Impedance, Junction-to-Ambient

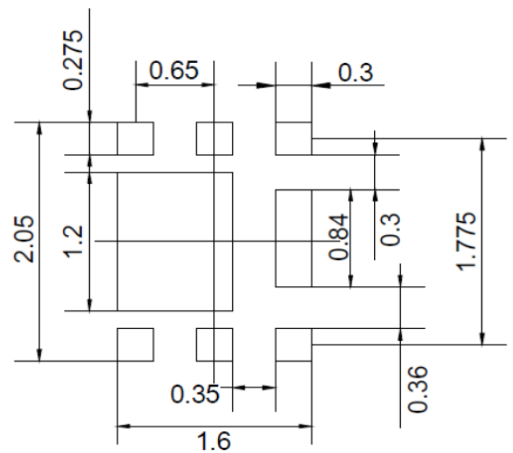
DFN2*2-6L PACKAGE OUTLINE DIMENSIONS

DFN2x2-6



SYMBOL	DFN2x2-6			
	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A	0.70	0.80	0.028	0.031
A1	0.00	0.05	0.000	0.002
A3	0.200 REF		0.008 REF	
b	0.25	0.35	0.010	0.014
D	1.90	2.10	0.075	0.083
E	1.90	2.10	0.075	0.083
D1	0.90	1.10	0.035	0.043
E1	0.90	1.10	0.035	0.043
e	0.65 BSC		0.026 BSC	
L	0.20	0.30	0.008	0.012
K1	0.65	0.85	0.026	0.033
K2	0.20	-	0.008	-
K3	0.20	-	0.008	-
K4	0.32	-	0.013	-
K5	0.20	0.26	0.008	0.010
K6	0.45	0.55	0.018	0.022

RECOMMENDED LAND PATTERN



UNIT: mm

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