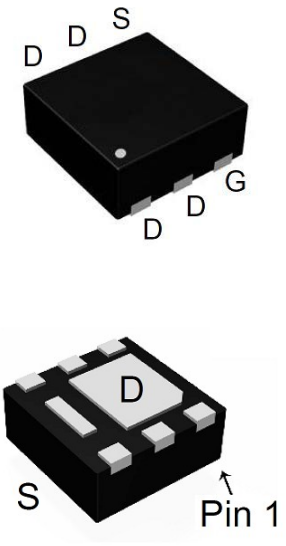
P-Channel Enhancement-Mode MOSFET (-20V, -8.0 A)

PRODUCT SUMMARY		
V_{DSS}	I_D	$R_{DS(on)}$ (mΩ) Max
-20V	-8.0A	25 @ V_{GS} = -4.5V,I_D=-8.0A
		36 @ V_{GS} = -2.5V,I_D=-4.0A
		45 @ V_{GS} = -1.8V,I_D=-1.5A

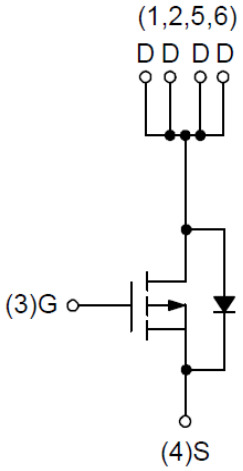
Features

- Super high dense cell trench design for low $R_{DS(on)}$.
- Rugged and reliable.
- DFN2*2-6 package
- Ordering information:GR2313(Lead(Pb)- free and halogen-free)

RoHS+HF



DFN2*2-6



Marking Information

GR2313
—product code
XXXXQY
—Lot Code

Absolute Maximum Ratings (T_A=25℃, unless otherwise noted)

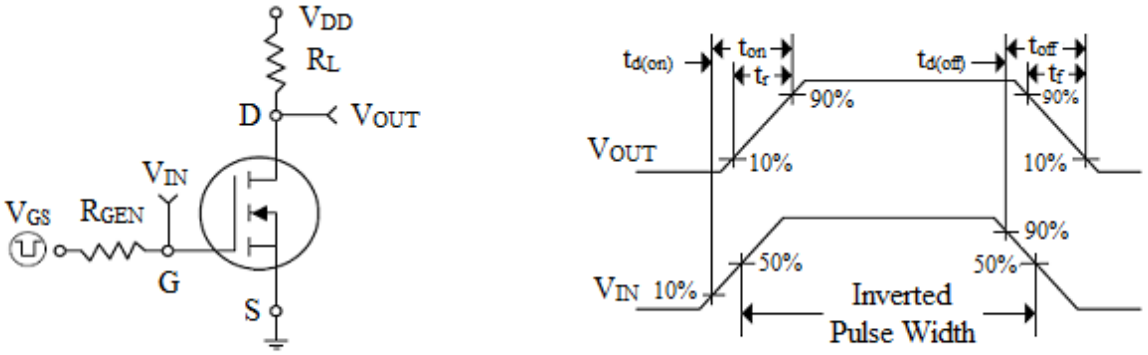
Symbol	Parameter	Ratings	Units
V_{DS}	Drain-Source Voltage	-20	V
V_{GS}	Gate-Source Voltage	±12	V
I_D	Drain Current (Continuous)	-8.0	A
I_{DM}	Drain Current (Pulsed)	-32	A
I_S	Drain-Source Diode Forward Current [a]	-1	A
P_D	Total Power Dissipation @TA=25℃	2.5	W
T_j, T_{stg}	Operating Junction and Storage Temperature Range	-55 to +150	℃
$R_{\theta JA}$	Thermal Resistance Junction to Ambient (t≤10S) [a]	55	℃/W
	Thermal Resistance Junction to Ambient (Steady State) [a]	85	

a: Surface Mounted on FR4 Board , t ≤ 5sec .

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

Symbol	Characteristic	Test Conditions	Min.	Typ.	Max.	Unit
• Off Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=-250μA	-20	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=-16V, V_{GS}=0V	-	-	-1	μA
I_{GSS}	Gate-Body Leakage Current	V_{GS}=±12V, V_{DS}=0V	-	-	±100	nA
• On Characteristicsc						
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=-250μA	-0.60	-	-1.0	V
$R_{DS(on)}$	Drain-Source On-State Resistance	V_{GS}=-4.5V, I_D=-5.7A	-	25	28	mΩ
		V_{GS}=-2.5V, I_D=-3.7A	-	33	38	
		V_{GS}=-1.8V, I_D=-1.5A	-	46	56	
g_{fs}	Forward Transconductance	V_{DS}=-5V, I_D=-5.7A	-	11	-	S
• Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{DS}=-10V, V_{GS}=0V, f=1MHz	-	2100	-	pF
C_{oss}	Output Capacitance		-	498	-	
C_{rss}	Reverse Transfer Capacitance		-	300	-	
• Switching Characteristics						
Q_g	Total Gate Charge	V_{DS}=-10V, I_D=-6A, V_{GS}=-4.5V	-	17	-	nC
Q_{gs}	Gate-Source Charge		-	4.1	-	
Q_{gd}	Gate-Drain Charge		-	4.3	-	
$t_{d(on)}$	Turn-on Delay Time	V_{DD}=-10V, R_L=10Ω, I_D=-1A, V_{GS}=-4.5V, R_{GEN}=6Ω	-	25	-	nS
t_r	Turn-on Rise Time		-	30	-	
$t_{d(off)}$	Turn-off Delay Time		-	70	-	
t_f	Turn-off Fall Time		-	50	-	
• Drain-Source Diode Characteristics						
V_{SD}	Drain-Source Diode Forward Voltage	V_{GS}=0V, I_S=-1.0A	-	-	-1.2	V

Note: Guaranteed by design , not subject to production testing .



Switching Test Circuit and Switching Waveforms

Characteristics Curve

Figure.1 Output Characteristics

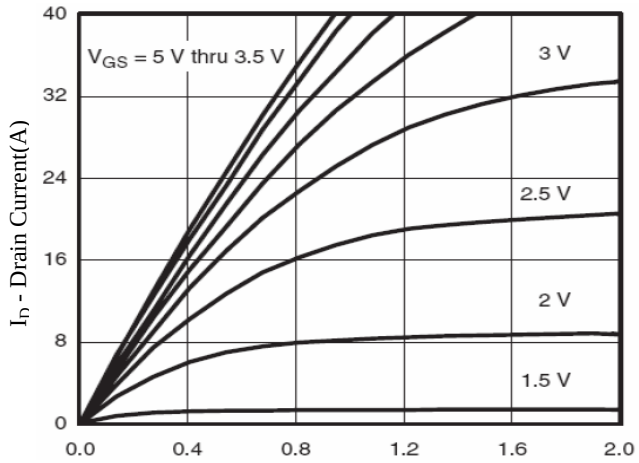


Figure.2 Drain-Source On-Resistance

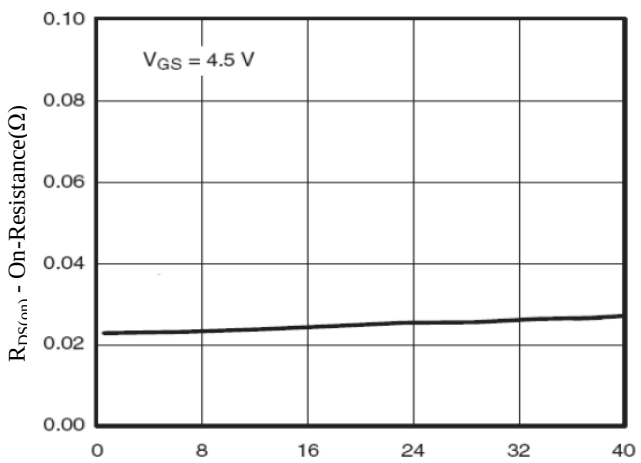


Figure.3 Transfer Characteristics

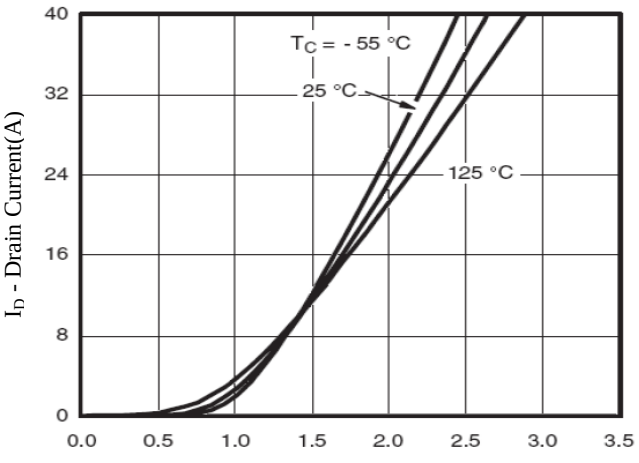


Figure.4 Drain-Source On-Resistance

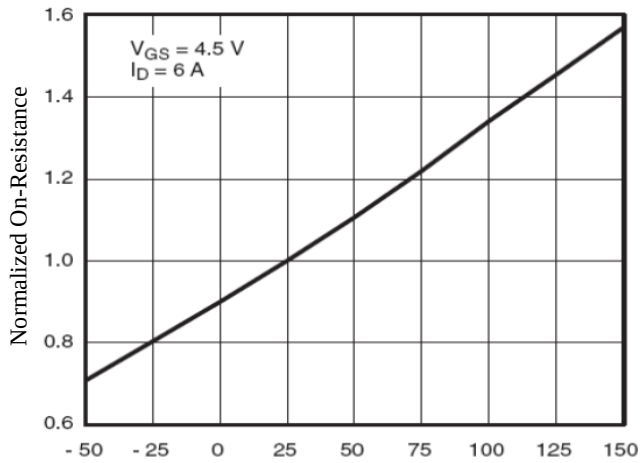


Figure.5 $R_{DS(on)}$ vs. Gate-Source Voltage

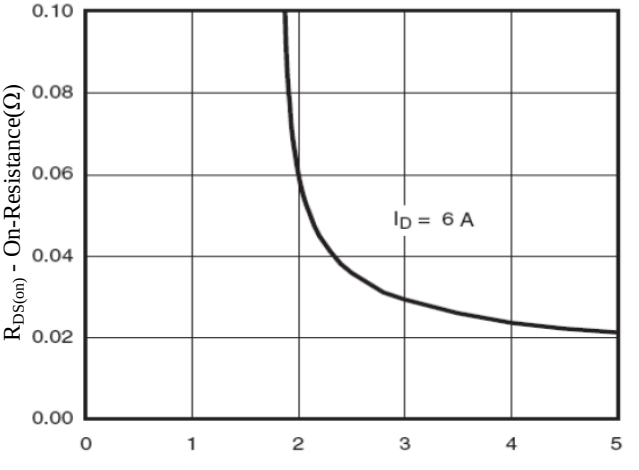
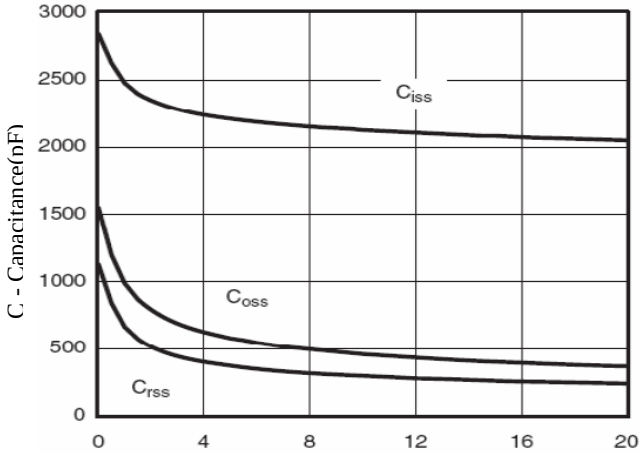


Figure.6 Capacitance Characteristics



Characteristics Curve

Figure.7 Gate Charge Characteristics

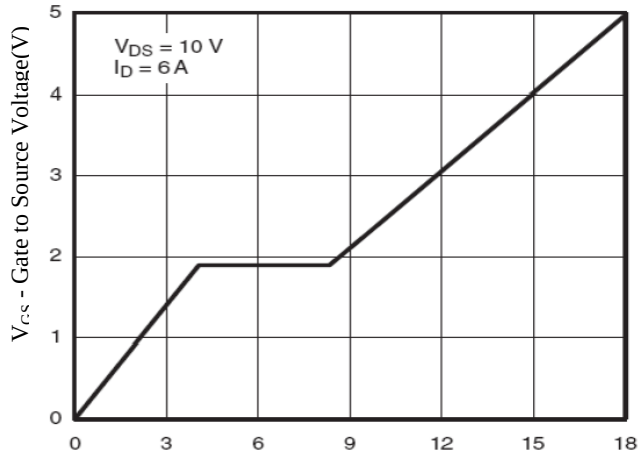


Figure.8 Source-Drain Diode Forward Voltage

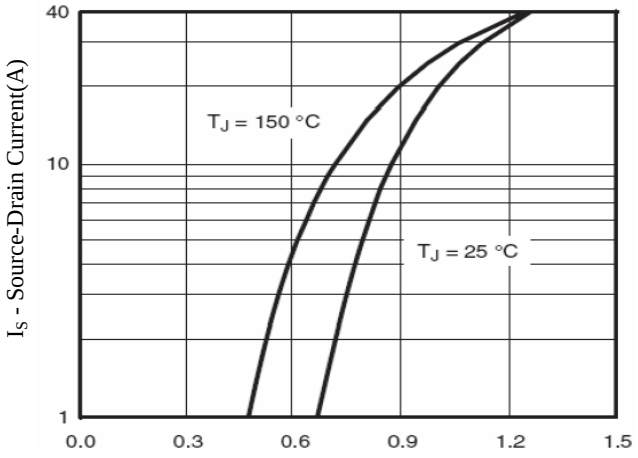


Figure.9 Maximum Safe Operating Area

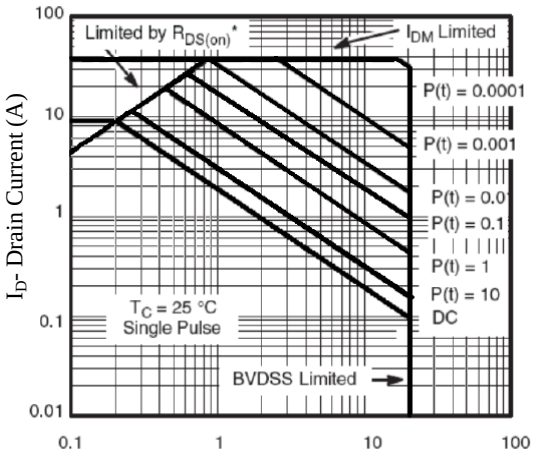
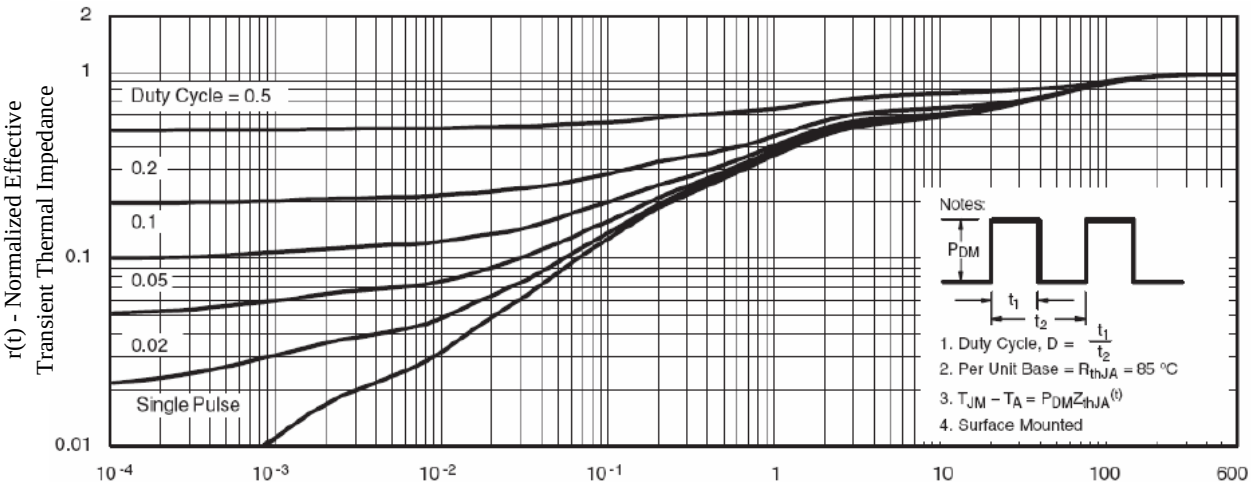
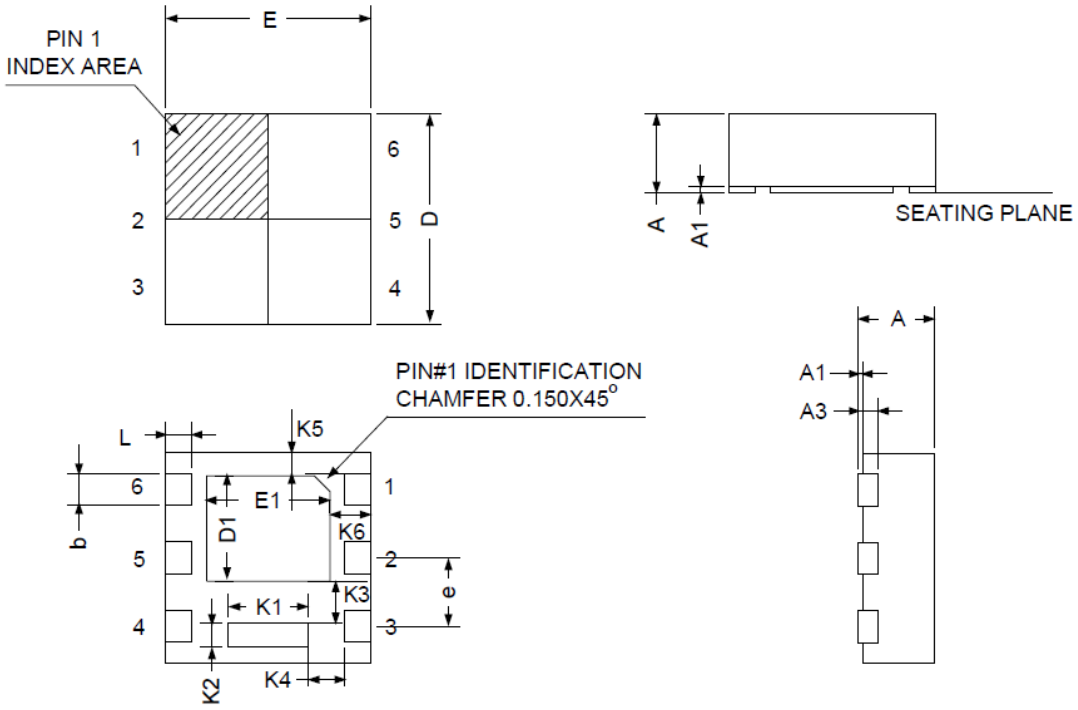


Figure 10 Normalized Maximum Transient Thermal Impedance



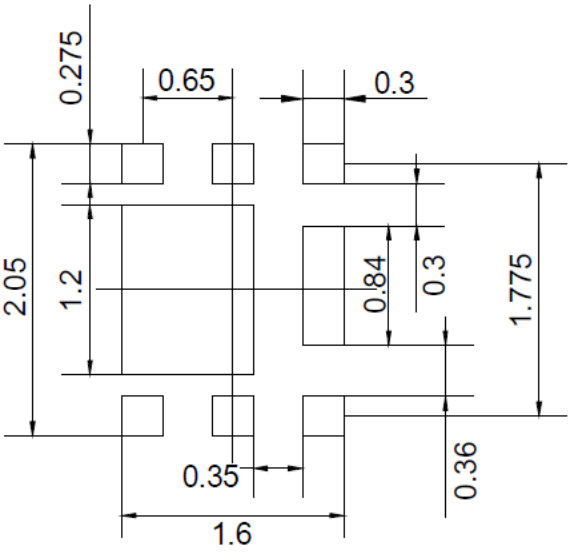
DFN2*2-6 PACKAGE OUTLINE DIMENSIONS

DFN2x2-6



Symbol	DFN2*2-6			
	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

Notice

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2. Stresses beyond those listed under “Absolute Maximum Ratings” may cause permanent damage to the device. These are stress ratings only and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications are not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.