

## Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	$I_D$
-40V	33mΩ@-10V	-6A
	45mΩ@-4.5V	

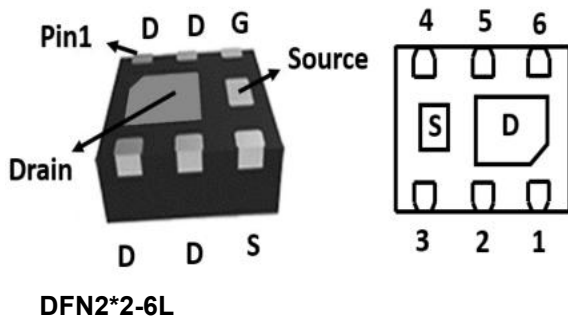
## Feature

- Advanced trench MOSFET process technology
- Ultra low on-resistance with low gate charge

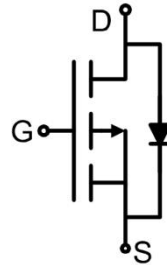
## Application

- PWM applications
- Load switch
- Battery charge in cellular handset

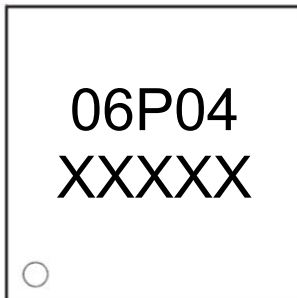
## Package



## Circuit diagram



## Marking



### Absolute maximum ratings ( $T_A=25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	$V_{DS}$	-40	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Continuous Drain Current	$I_D$	-6	A
Pulsed Drain Current <sup>1)</sup>	$I_{DM}$	-38	A
Power Dissipation	$P_D$	2.1	W
Thermal Resistance Junction-to-Ambient <sup>2)</sup>	$R_{\theta JA}$	59.5	$^\circ\text{C}/\text{W}$
Junction Temperature	$T_J$	150	$^\circ\text{C}$
Storage Temperature	$T_{STG}$	-55 ~ +150	$^\circ\text{C}$

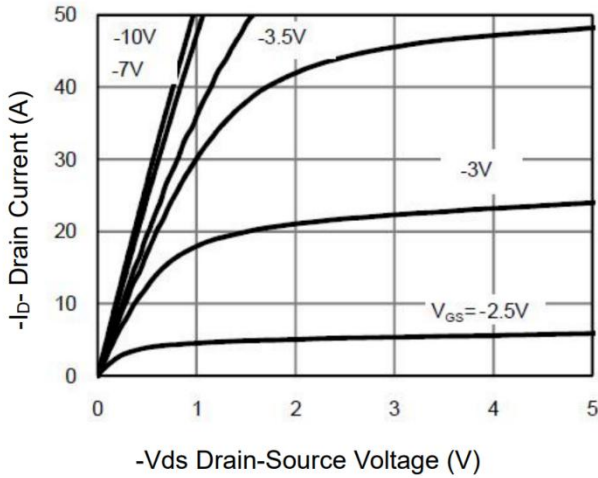
### Electrical characteristics ( $T_A=25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
<b>Static Characteristics</b>						
Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS} = 0\text{V}, I_D = -250\mu\text{A}$	-40			V
Zero gate voltage drain current	$I_{DSS}$	$V_{DS} = -40\text{V}, V_{GS} = 0\text{V}$			-1	$\mu\text{A}$
Gate-body leakage current	$I_{GSS}$	$V_{GS} = \pm 20\text{V}, V_{DS} = 0\text{V}$			$\pm 100$	nA
Gate threshold voltage <sup>3)</sup>	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250\mu\text{A}$	-1.1	-1.7	-2.1	V
Drain-source on-resistance <sup>3)</sup>	$R_{DS(on)}$	$V_{GS} = -10\text{V}, I_D = -6\text{A}$		26	33	m $\Omega$
		$V_{GS} = -4.5\text{V}, I_D = -5\text{A}$		34	45	
<b>Dynamic characteristics<sup>4)</sup></b>						
Input Capacitance	$C_{iss}$	$V_{DS} = -20\text{V}, V_{GS} = 0\text{V}, f = 1\text{MHz}$		964		pF
Output Capacitance	$C_{oss}$			109		
Reverse Transfer Capacitance	$C_{rss}$			96		
Total Gate Charge	$Q_g$	$V_{DS} = -20\text{V}, V_{GS} = -10\text{V}, I_D = -6\text{A}$		22.9		nC
Gate-Source Charge	$Q_{gs}$			3.5		
Gate-Drain Charge	$Q_{gd}$			5.3		
Turn-on delay time	$t_{d(on)}$	$V_{DD} = -20\text{V}, V_{GS} = -10\text{V}, I_D = -6\text{A}, R_{GEN} = 10\Omega$		5.5		nS
Turn-on rise time	$t_r$			14		
Turn-off delay time	$t_{d(off)}$			24		
Turn-off fall time	$t_f$			12		
<b>Source-Drain Diode characteristics</b>						
Diode Forward Current <sup>2)</sup>	$I_S$				-6	A
Diode Forward voltage <sup>3)</sup>	$V_{SD}$	$V_{GS} = 0\text{V}, I_S = -6\text{A}$			-1.2	V

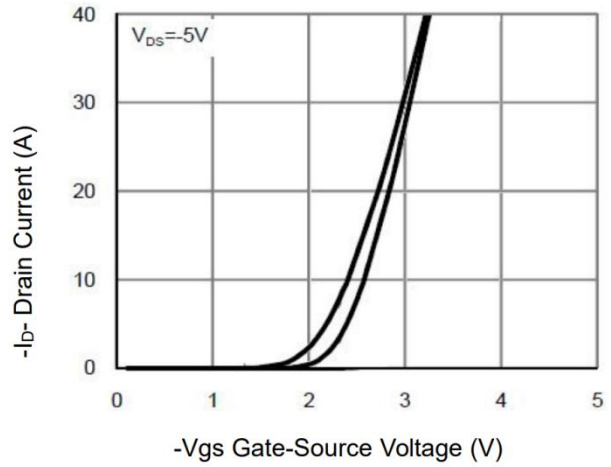
Notes:

- 1) Repetitive Rating: Pulse width limited by maximum junction temperature.
- 2) Device mounted on FR-4 substrate PC board, 2oz copper, with thermal vias to bottom layer 1inch square copper plate.
- 3) Pulse Test: Pulse Width  $\leq 300\mu\text{s}$ , Duty Cycle  $\leq 2\%$ .
- 4) Guaranteed by design, not subject to production.

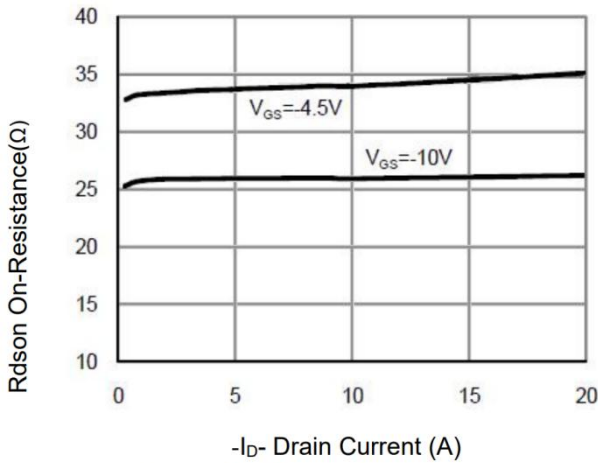
## Typical Characteristics



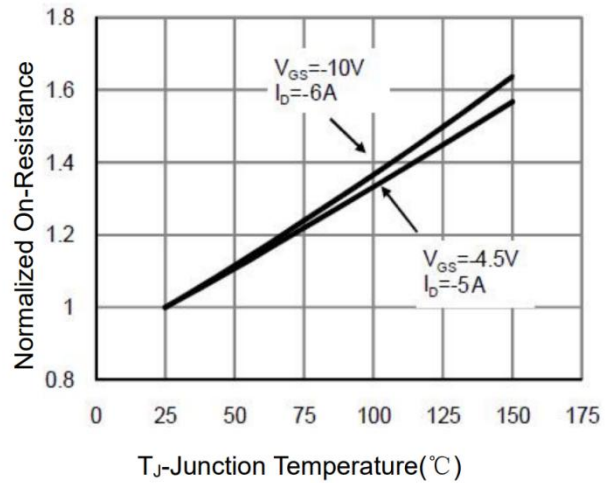
**Figure 1 Output Characteristics**



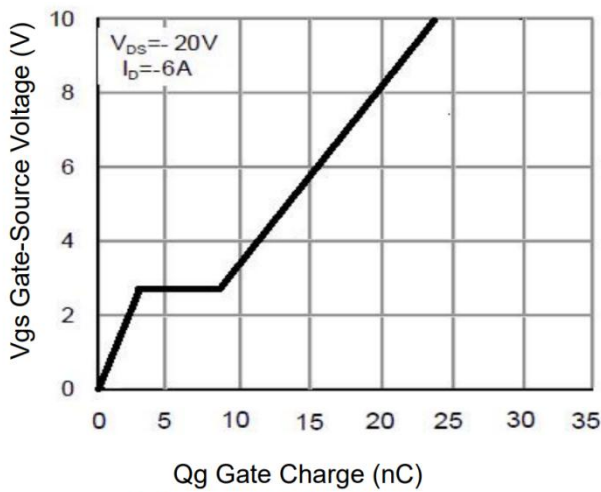
**Figure 2 Transfer Characteristics**



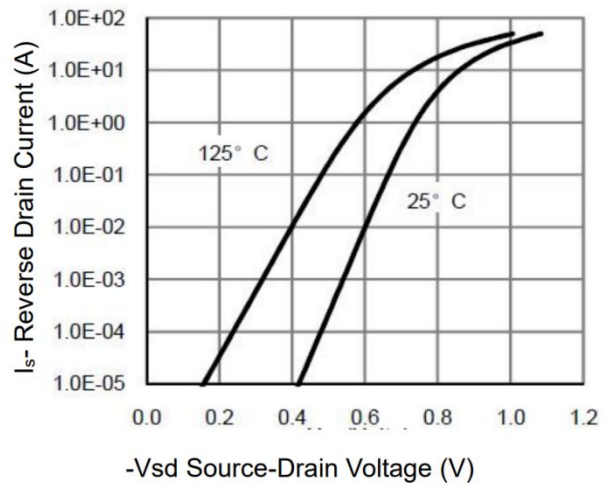
**Figure 3 Rdson- Drain Current**



**Figure 4 Rdson-Junction Temperature**

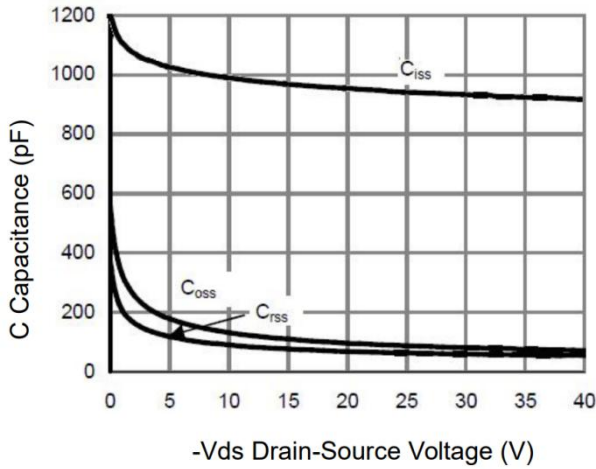


**Figure 5 Gate Charge**

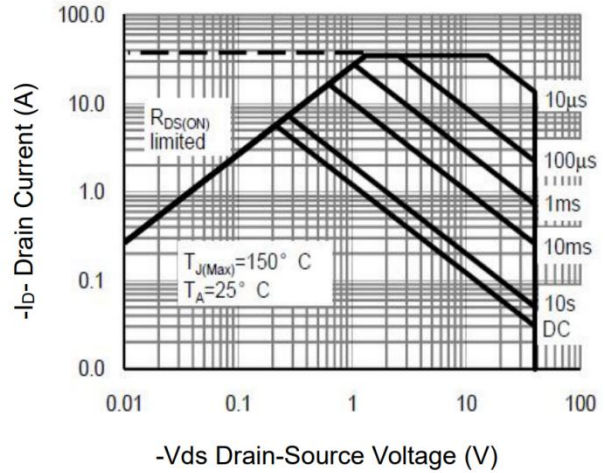


**Figure 6 Source- Drain Diode Forward**

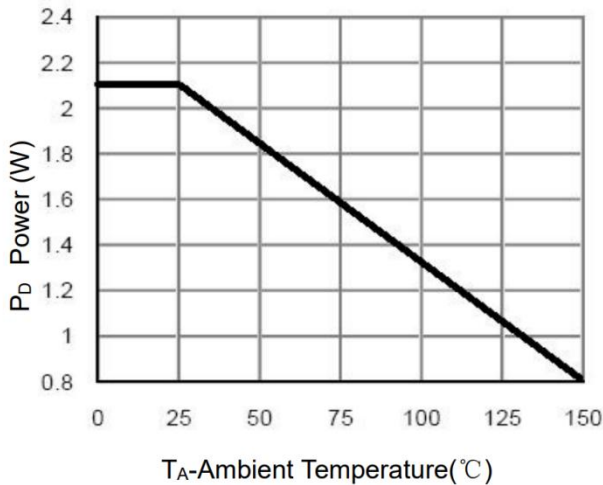
## Typical Characteristics



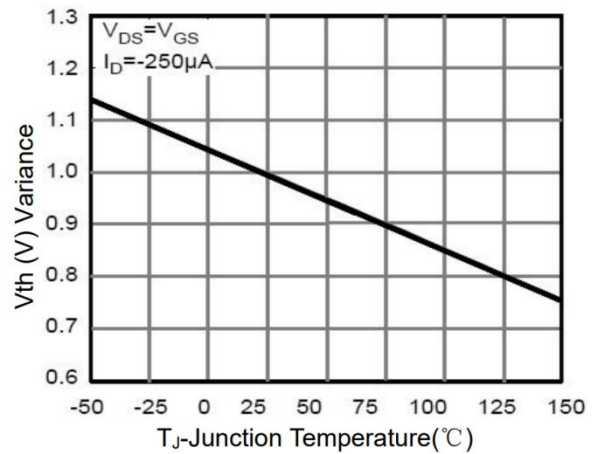
**Figure 7 Capacitance vs Vds**



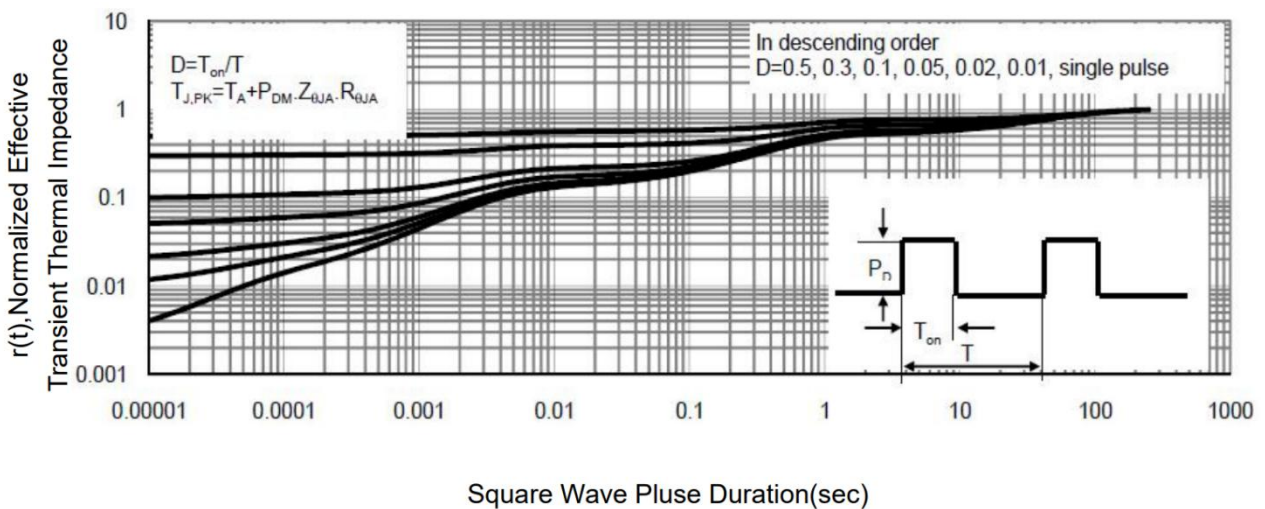
**Figure 8 Safe Operation Area**



**Figure 9 Power Dissipation**

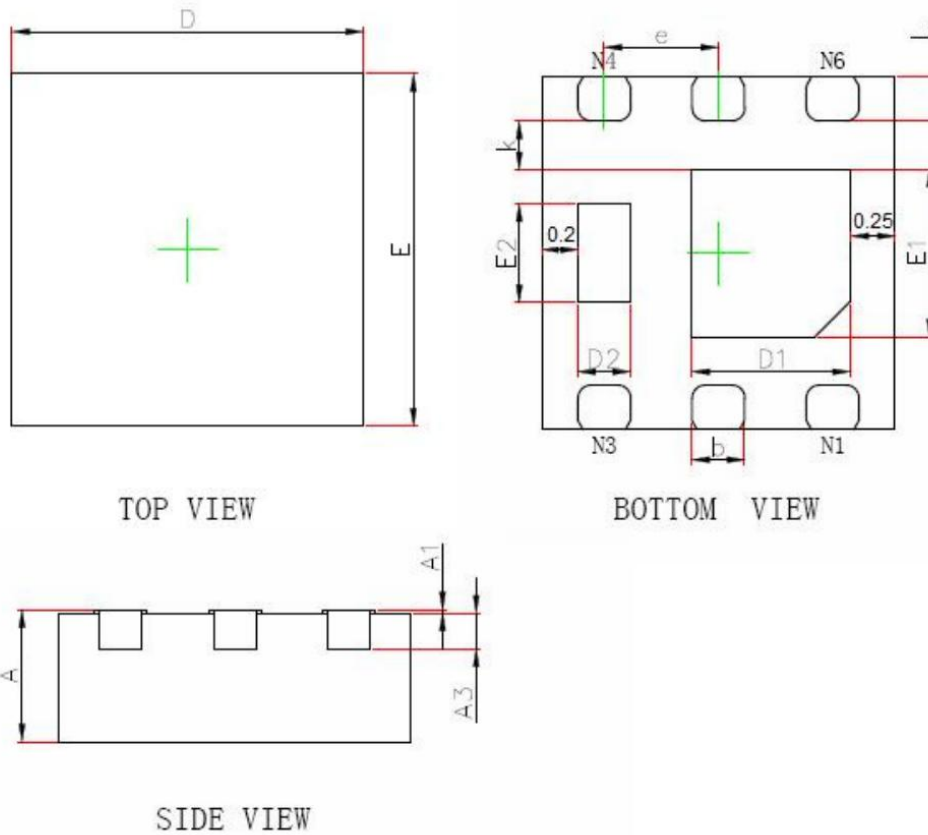


**Figure 10 VGS(th) vs Junction Temperature**



**Figure 11 Normalized Maximum Transient Thermal Impedance**

### DFN2\*2-6L Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.700	0.900	0.028	0.035
A1	0.000	0.050	0.000	0.002
A3	0.203 REF.		0.008 REF.	
D	1.924	2.076	0.076	0.082
E	1.924	2.076	0.076	0.082
D1	0.800	1.000	0.031	0.039
E1	0.850	1.050	0.033	0.041
D2	0.200	0.400	0.008	0.016
E2	0.460	0.660	0.018	0.026
k	0.200 MIN.		0.008 MIN.	
b	0.250	0.350	0.010	0.014
e	0.650 TYP.		0.026 TYP.	
L	0.174	0.326	0.007	0.013