

**Features**

$BV_{DSS}$	30V
$R_{DS(ON)}$	450m $\Omega$
$I_D$	800mA

**Application**

- Load/Power Switching
- Interfacing Switching
- Battery Management for Ultra Small Portable Electronics
- Logic Level Shift

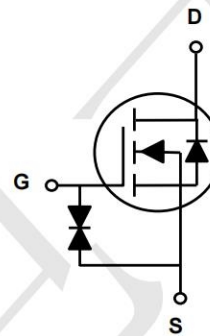
**Package and Pin Configuration**



DFN1006-3L

Marking:35

**Circuit diagram**



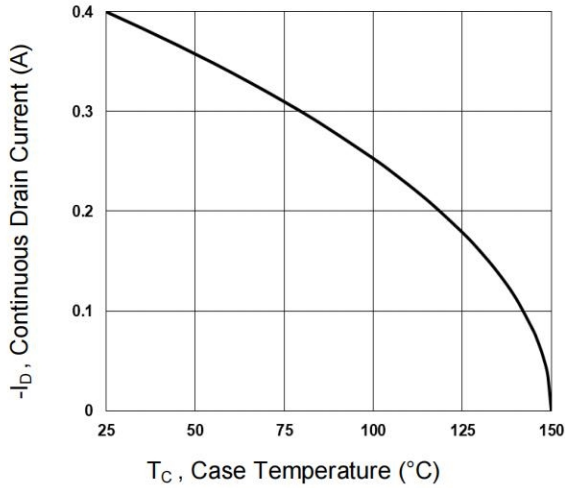
**Absolute Maximum Ratings ( $T_A=25^\circ\text{C}$  unless otherwise noted)**

Parameter	Symbol	Max.	Unit
Drain-Source Voltage	$V_{DS}$	30	V
Gate-Source Voltage	$V_{GS}$	$\pm 12$	V
Drain Current-Continuous( $T_C=25^\circ\text{C}$ )	$I_D$	800	mA
Drain Current-Pulsed <sup>1</sup>	$I_{DM}$	2100	mA
Power Dissipation( $T_C=25^\circ\text{C}$ )	$P_D$	155	mW
Power Dissipation-Derate Above $25^\circ\text{C}$		1.25	mW/ $^\circ\text{C}$
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	800	$^\circ\text{C}/\text{W}$
Storage Temperature Range	$T_{STG}$	-55 To +150	$^\circ\text{C}$
Operating Junction Temperature Range	$T_J$	-55 To +150	$^\circ\text{C}$

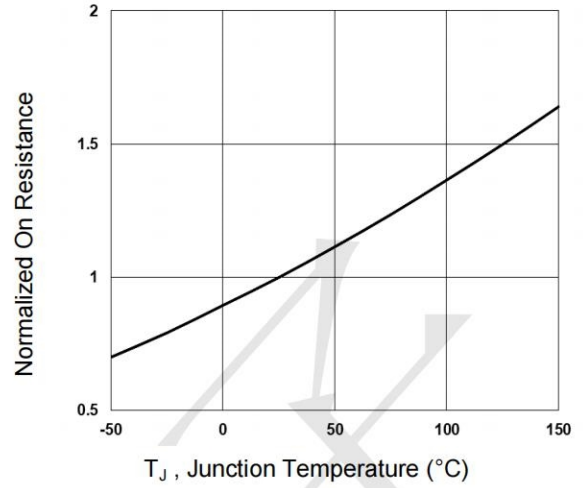
**Electrical Characteristics (  $T_A = 25^\circ\text{C}$  unless otherwise noted )**

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
<b>Off Characteristics</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS}=0V, I_D=250\mu A$	30	-	-	V
$BV_{DSS}$ Temperature Coefficient	$\Delta BV_{DSS}/\Delta T_J$	Reference to $25^\circ\text{C}$ , $I_D=1mA$	-	-0.03	-	$V/^\circ\text{C}$
Drain-Source Leakage Current	$I_{DSS}$	$V_{DS}=30V, V_{GS}=0V,$ $T_J=25^\circ\text{C}$	-	-	1	$\mu A$
		$V_{DS}=24V, V_{GS}=0V,$ $T_J=125^\circ\text{C}$	-	-	10	$\mu A$
Gate-Source Leakage Current	$I_{GSS}$	$V_{GS}=\pm 12V, V_{DS}=0V$	-	-	$\pm 20$	$\mu A$
<b>On Characteristics</b>						
Static Drain-Source On-Resistance	$R_{DS(ON)}$	$V_{GS}=4.5V, I_D=0.5A$	-	350	450	m $\Omega$
		$V_{GS}=2.5V, I_D=0.5A$	-	450	650	
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	0.5	0.8	1.2	V
$V_{GS(th)}$ Temperature Coefficient	$\Delta V_{GS(th)}$		-	-1.74	-	mV/ $^\circ\text{C}$
Forward Transconductance	$g_{FS}$	$V_{DS}=4V, I_D=0.3A$	-	1	-	S
<b>Dynamic and Switching Characteristics</b>						
Total Gate Charge <sup>2,3</sup>	$Q_g$	$V_{DS}=15V, I_D=0.3A,$ $V_{GS}=4.5V$	-	2.6	5.2	nC
Gate-Source Charge <sup>2,3</sup>	$Q_{gs}$		-	0.9	1.8	
Gate-Drain Charge <sup>2,3</sup>	$Q_{gd}$		-	0.6	1.2	
Turn-On Delay Time <sup>2,3</sup>	$t_{d(on)}$	$V_{DD}=15V, R_G=10\Omega$ $V_{GS}=4.5V, I_D=0.3A$	-	5.5	11	nS
Rise Time <sup>2,3</sup>	$t_r$		-	4	8	
Turn-Off Delay Time <sup>2,3</sup>	$t_{d(off)}$		-	14.5	29	
Fall Time <sup>2,3</sup>	$t_f$		-	6.5	13	
Input Capacitance	$C_{iss}$	$V_{DS}=15V, V_{GS}=0V,$ $F=1MHz$	-	72.9	146	PF
Output Capacitance	$C_{oss}$		-	18.3	36.6	
Reverse Transfer Capacitance	$C_{rss}$		-	7.4	14.8	
<b>Drain-Source Diode Characteristics and Maximum Ratings</b>						
Continuous Source Current	$I_S$	$V_G=V_D=0V,$	-	-	400	mA
Pulsed Source Current	$I_{SM}$	Force Current	-	-	800	
Diode Forward Voltage	$V_{SD}$	$V_{GS}=0V, I_S=0.2A,$ $T_J=25^\circ\text{C}$	-	-	1	V
Reverse Recovery Time	$T_{rr}$	$V_{GS}=0V, I_S=0.3A,$ $d/d_i=100A/\mu s,$	-	13	-	nS
Reverse Recovery Charge	$Q_{rr}$	$T_J=25^\circ\text{C}$	-	6	-	nC

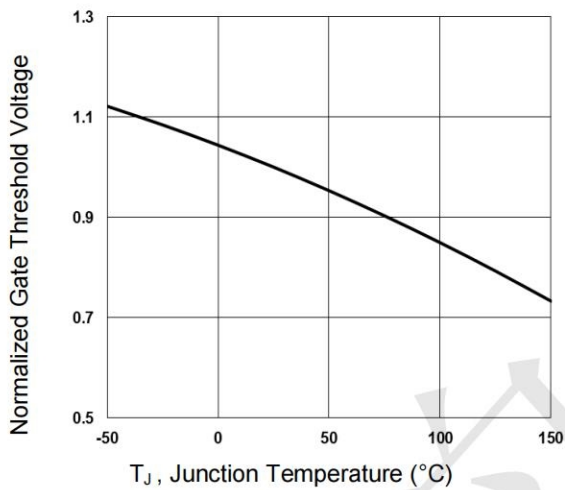
**Typical Electrical and Thermal Characteristic Curves**



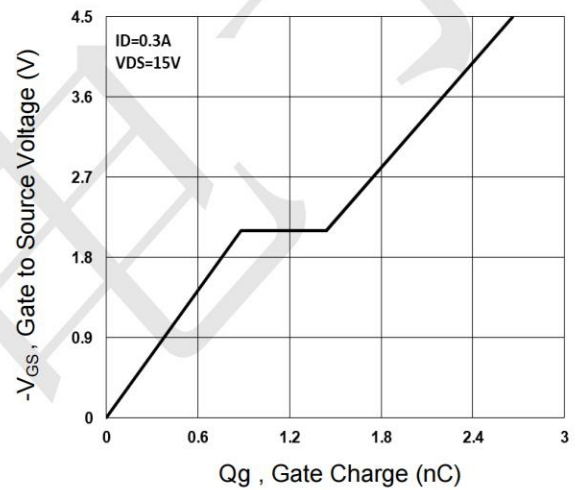
**Figure 1. Continuous Drain Current vs.  $T_c$**



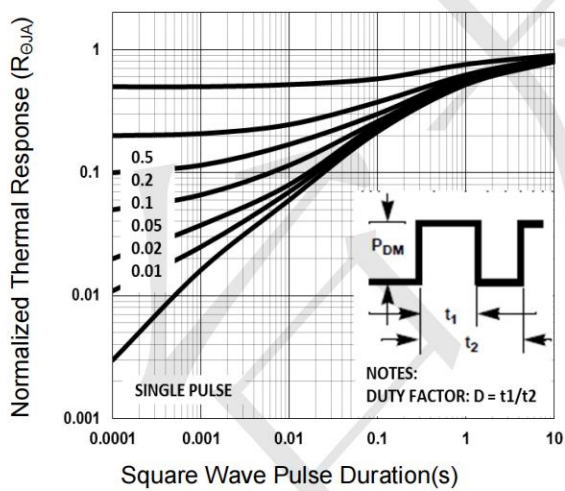
**Figure 2. Normalized  $R_{DS(on)}$  vs.  $T_j$**



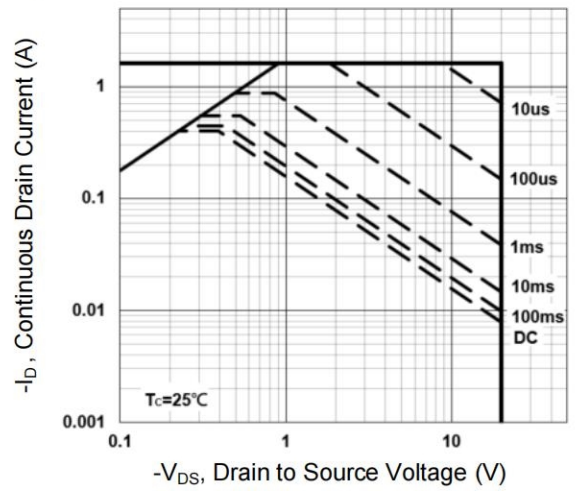
**Figure 3. Normalized  $V_{th}$  vs.  $T_j$**



**Figure 4. Gate Charge Waveform**



**Figure 5. Normalized Transient Response**



**Figure 6. Maximum Safe Operation Area**

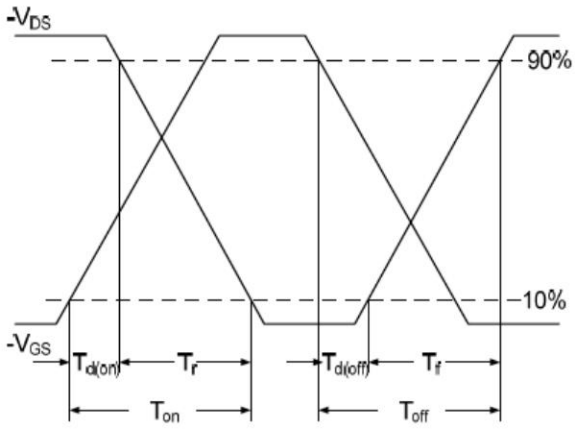


Figure 7. Switching Time Waveform

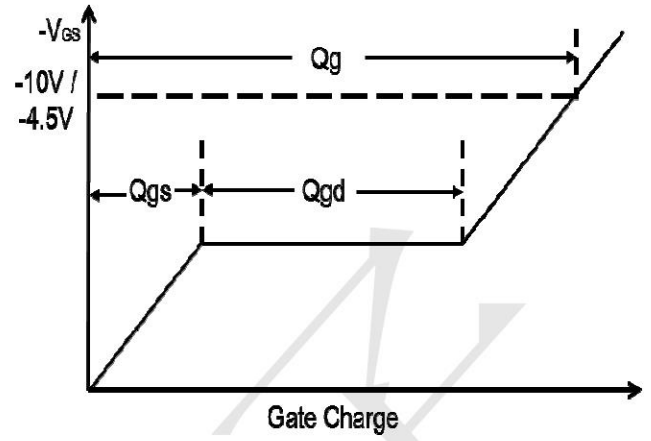
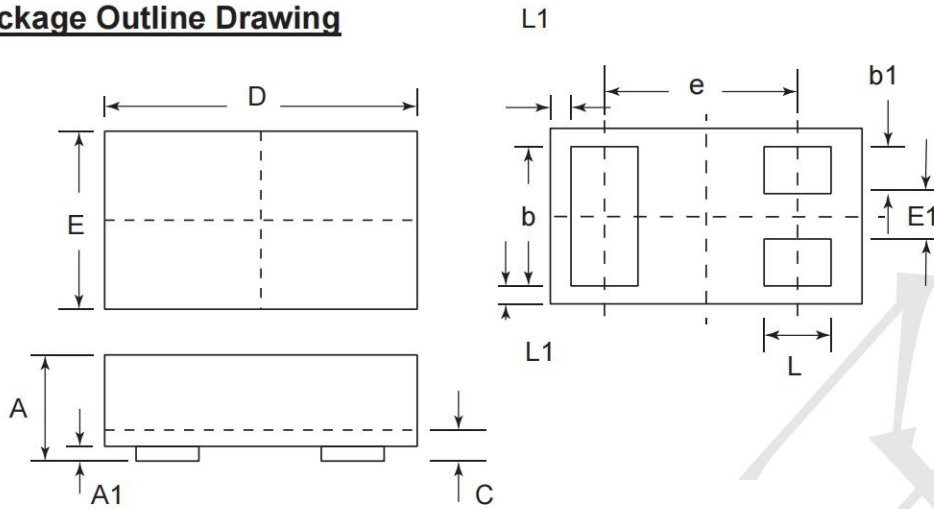


Figure 8. Gate Charge Waveform

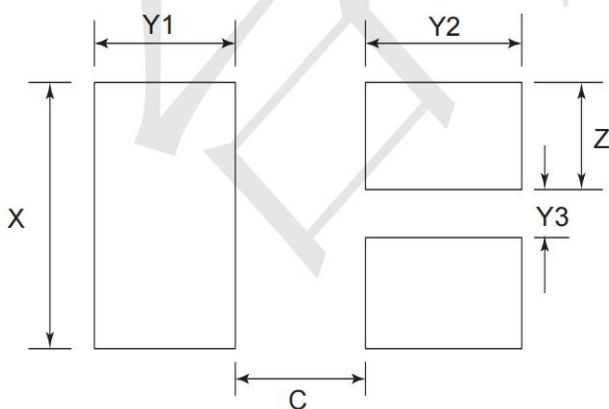


**DFN1006-3L Package Outline Drawing**



SYM	DIMENSIONS					
	MILLIMETERS			INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.45	0.50	0.55	0.018	0.020	0.022
A1	0.00	0.02	0.05	0.000	0.001	0.002
b	0.45	0.50	0.55	0.018	0.020	0.022
b1	0.10	0.15	0.20	0.004	0.006	0.008
C	0.12	0.15	0.18	0.005	0.006	0.007
D	0.95	1.00	1.05	0.037	0.039	0.041
e	0.65 BSC			0.026 BSC		
E	0.55	0.60	0.65	0.022	0.024	0.026
E1	0.15	0.20	0.25	0.006	0.008	0.010
L	0.20	0.25	0.30	0.008	0.010	0.012
L1	0.05 REF			0.0002 REF		

**Suggested Land Pattern**



SYM	DIMENSIONS	
	MILLIMETERS	INCHES
C	0.25	0.010
X	0.65	0.024
Y1	0.50	0.020
Y2	0.50	0.020
Y3	0.25	0.010
Z	0.20	0.008