

FEATURES

| Low $V_{GS(th)}$, can be driven directly from a battery

| Low $R_{DS(on)}$

| ESD Protected Gate 2kV



DFN1006-3L



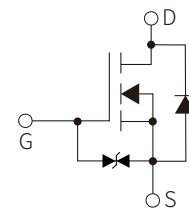
Marking

APPLICATION

| Load Switch

| Portable Applications

| Power Management Functions



Schematic Symbol

APPROVALS

RoHS Compliance with 2011/65/EU

HF Compliance with IEC61249-2-21:2003

ABSOLUTE MAXIMUM RATINGS($T_a=25^{\circ}\text{C}$)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DSS}	30	V
Continuous Drain Current $V_{GS}=4.5\text{V}$	I_D	(Note 6) 0.91	A
		(Note 6) 0.73	
		(Note 5) 0.75	
Pulsed Drain Current	I_{DM}	3	A
Gate-Source Voltage	V_{GS}	± 8	V
Power Dissipation	P_D	(Note 6) 0.69	W
		(Note 5) 0.47	
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	(Note 6) 180	$^{\circ}\text{C}/\text{W}$
		(Note 5) 258	
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to 150	$^{\circ}\text{C}$

ELECTRICAL CHARACTERISTICS (T_A=25°C unless otherwise noted)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Off Characteristics						
Drain-source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _D =10μA	30			V
Zero gate voltage drain current T _J =+25°C	I _{DSS}	V _{DS} =30V, V _{GS} =0V			1	μA
Gate-Source Leakage	I _{GSS}	V _{GS} =±8V, V _{DS} =0V			3	μA
On Characteristics						
Gate threshold voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	0.45		0.95	V
Static Drain-Source On-Resistance (Note 8)	R _{DS(on)}	V _{GS} =4.5V, I _D =200mA			460	mΩ
		V _{GS} =2.5V, I _D =100mA			560	
		V _{GS} =1.8V, I _D =75mA			730	
Forward Transfer Admittance	Y _{fs}	V _{DS} =3V, I _D =10mA	40			mS
Diode Forward Voltage (Note 8)	V _{SD}	V _{GS} =0V, I _S =300mA		0.7	1.2	V
Dynamic Characteristics (Note 9)						
Input capacitance	C _{iss}	V _{DS} =25V, V _{GS} =0V, f=1MHz		64.3		pF
Output capacitance	C _{oss}			6.1		pF
Reverse transfer capacitance	C _{rss}			4.5		pF
Gate Resistance	R _g	V _{DS} =0V, V _{GS} =0V, f=1MHz		70		V
Total Gate Charge	Q _g	V _{GS} =4.5V, V _{DS} =15V I _D =1A		1.6		nC
Gate-to-Source Charge	Q _{gs}			0.2		nC
Gate-to-Drain Charge	Q _{gd}			0.2		nC
Turn-on Delay Time	t _{d(on)}	V _{DS} =10V, I _D =1A V _{GS} =10V, R _G =6Ω		3.5		nS
Turn-on Rise Time	t _r			2.8		nS
Turn-Off Delay Time	t _{d(off)}			38		nS
Turn-Off Fall Time	t _f			13		nS

Notes:

- For a device surface mounted on a minimum recommended pad layout of an FR4 PCB, in still air conditions; the device is measured when operating in steady-state condition.
- Same as Note 5, except the device measured at t ≤ 10 seconds.
- Same as Note 5, except the device is pulsed at duty cycle of 1% for a pulse width of 10μs.
- Measured under pulsed conditions to minimize self-heating effect. Pulse width ≤ 300μs; duty cycle ≤ 2%.
- For design aid only, not subject to production testing.

PARAMETER CHARACTERISTIC CURVE

Fig 1: Typical Output Characteristic

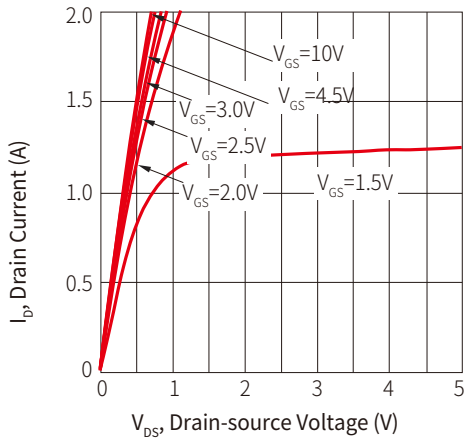


Figure 2: Typical Transfer Characteristics

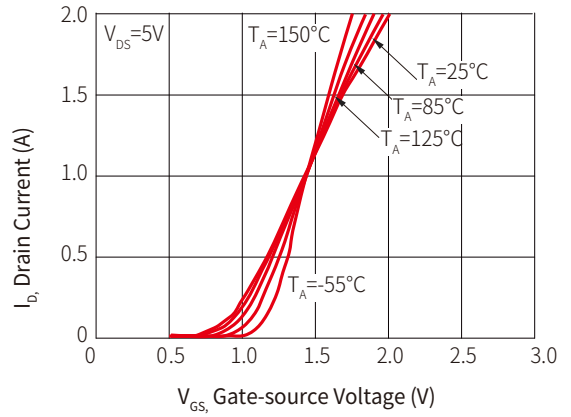


Figure 3: Typical On-Resistance vs. Drain Current and Gate Voltage

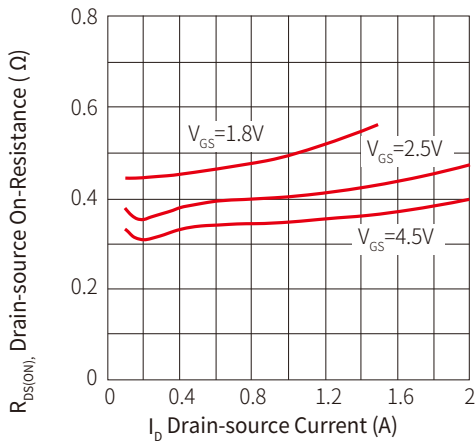


Figure 4: Typical On-Resistance vs. Drain Current and Temperature

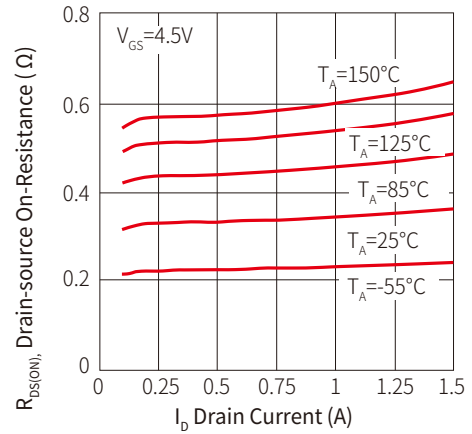


Figure 5: On-Resistance Variation with Temperature

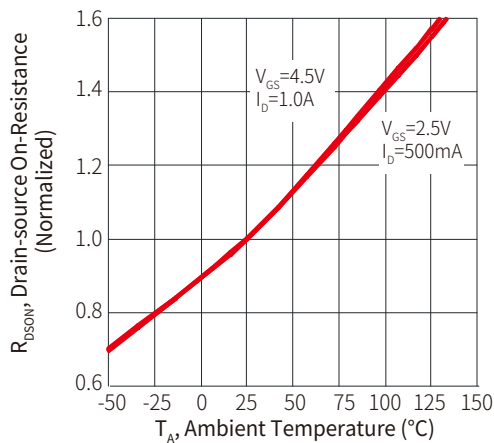


Figure 6: On-Resistance Variation with Temperature

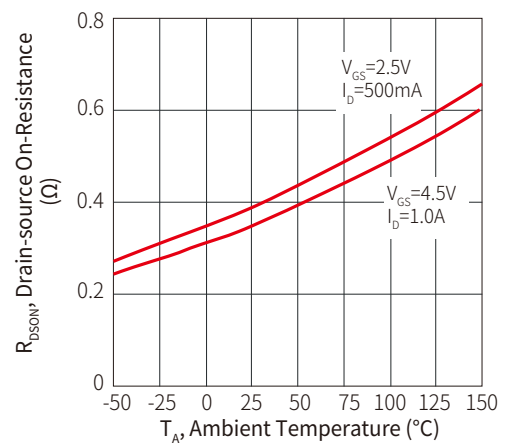


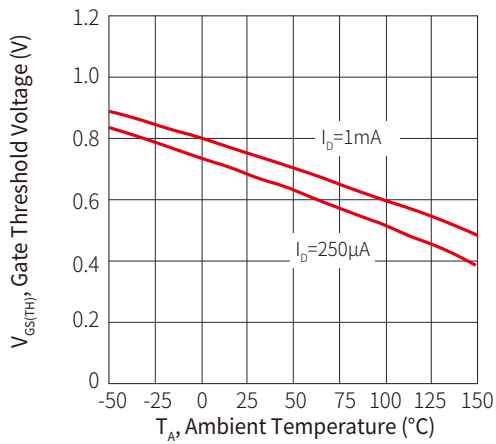
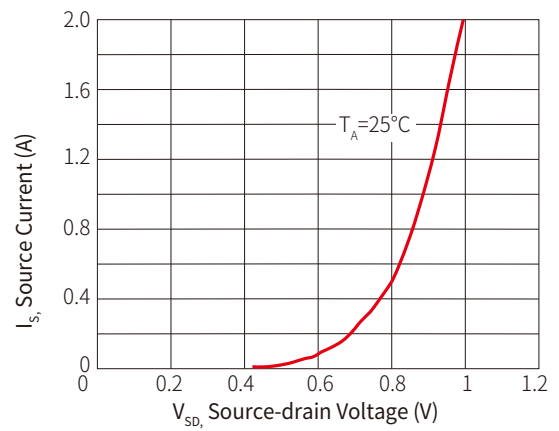
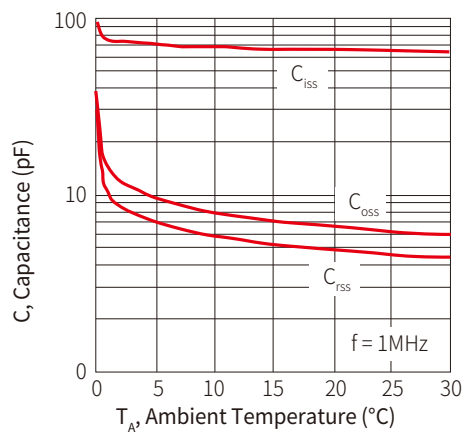
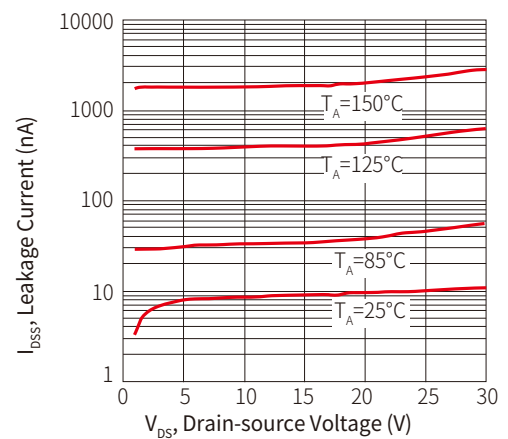
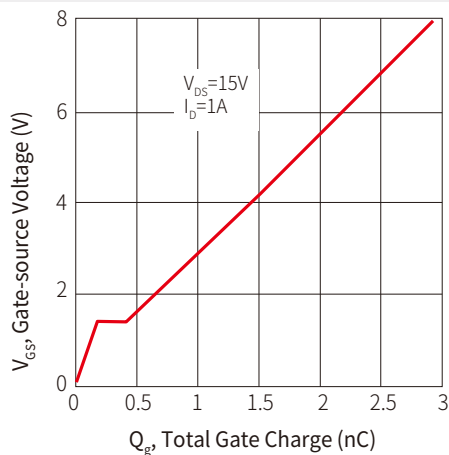
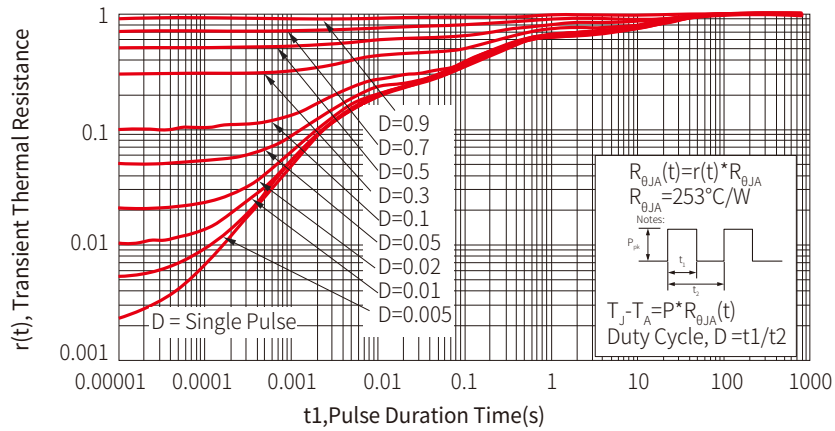
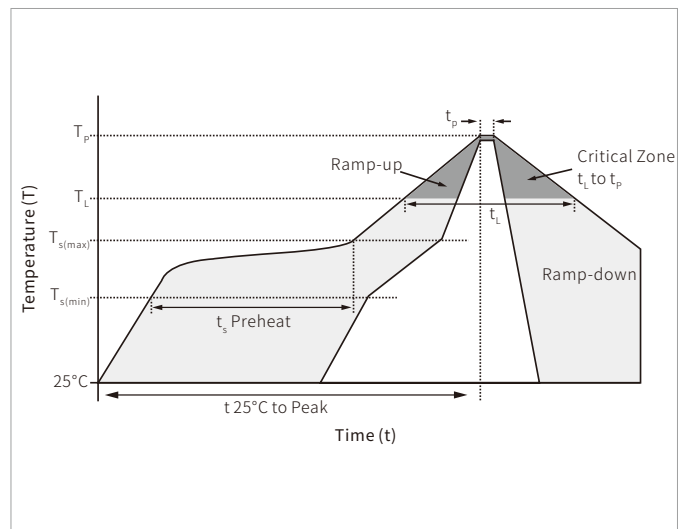
Figure 7: Gate Threshold Variation vs. Ambient Temperature

Figure 8: Diode Forward Voltage vs. Current

Figure 9: Typical Total Capacitance

Figure 10: Typical Leakage Current vs. Drain-Source Voltage

Figure 11: Gate-Charge Characteristics


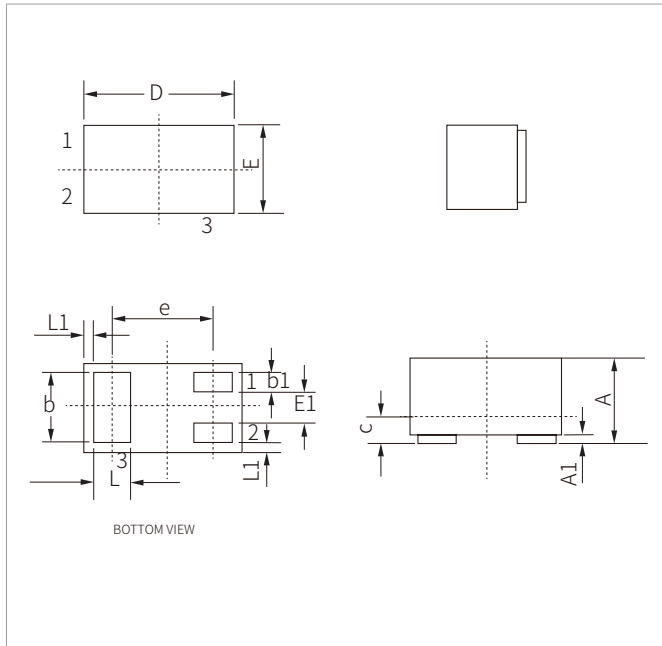
Figure 12: Transient Thermal Response


SOLDERING PARAMETERS

Reflow Condition		Lead-free assembly
Pre Heat	Temperature Max ($T_{s(min)}$)	150°C
	Temperature Max ($T_{s(max)}$)	200°C
	Time (min to max) (t_s)	60 – 180 secs
Average ramp up rate (Liquidus Temp (T_L) to peak)		3°C/second max
$T_{s(max)}$ to T_L - Ramp-up Rate		3°C/second max
Reflow	Temperature (T_L) (Liquidus)	217°C
	Time (min to max) (t_L)	60 – 150 seconds
Peak Temperature (T_p)		260°C
Time within 5°C of actual peak Temperature (t_p)		20 – 40 seconds
Ramp-down Rate		6°C/second max
Time 25°C to peak Temperature (T_p)		8 minutes max.
Do not exceed		260°C

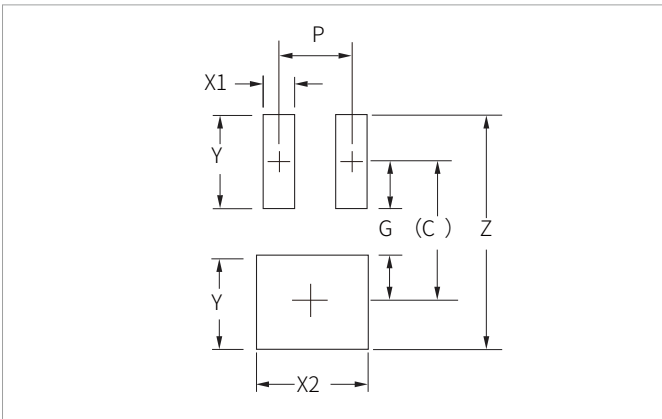


DFN1006-3L PACKAGE INFORMATION



Ref.	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	0.35	0.60	0.014	0.024
A1	0	0.05	0	0.002
b	0.45	0.55	0.018	0.022
b1	0.10	0.20	0.004	0.008
c	0.12	0.18	0.005	0.007
D	0.95	1.05	0.037	0.041
e	0.65BSC		0.026BSC	
E	0.55	0.70	0.022	0.027
E1	0.20	0.30	0.008	0.014
L	0.20	0.30	0.008	0.012
L1	0.05REF		0.002REF	

RECOMMENDED PAD LAYOUT DIMENSIONS



Ref.	Millimeters	Inches
C	(0.85)	(0.033)
P	0.40	0.016
G	0.30	0.012
X1	0.20	0.008
X2	0.60	0.024
Y	0.55	0.022
Z	1.40	0.055

ORDERING INFORMATION

Part Number	Component Package	QTY/Reel	Reel Size
SNM3730D3	DFN1006-3L	10000PCS	7"

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