FEATURES

- Surface-mounted package
- Advanced trench cell design
- Extremely low threshold voltage
- ESD protected

DFN1006-3L

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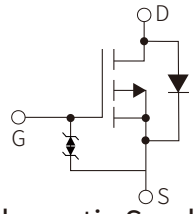
Marking

APPLICATION

- Portable appliances



Schematic Symbol

APPROVALS

RoHS	Compliance with 2011/65/EU
HF	Compliance with IEC61249-2-21:2003

ABSOLUTE MAXIMUM RATINGS

Parameter		Symbol	Value	Unit
Drain-Source Voltage T_A=25°C		V_{DS}	-20	V
Pulsed Drain Current T_A=25°C V_{GS}=-4.5V		I_{DM}*,**	-2.6	A
Drain Current T_A=25°C V_{GS}=-4.5V		I_D*	-0.67	A
Gate-Source Voltage T_A=25°C		V_{GS}	±10	V
Total Power Dissipation	T_A=25°C	P_{tot}*	0.83	W
	T_A=100°C		0.33	
Diode Forward Current T_A=25°C		I_S*	-2.6	A
Junction Temperature		T_J	150	°C
Storage Temperature		T_{STG}	-55 to 150	°C
Thermal Resistance- Junction to Ambient		$R_{\theta JA}$*	150	°C/W

Notes:
* Surface Mounted on 1 in² pad area, t ⩽10 sec
** Pulse width ⩽300 μs, duty cycle ⩽ 2 %

ELECTRICAL CHARACTERISTICS (T_A=25°C)

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-source Breakdown Voltage	BV_{DSS}	V_{GS}=0V,I_{DS}=-250μA	-20			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_{DS}=-250μA	-0.3	-0.65	-1.0	V
Drain Leakage Current	I_{DSS}	V_{DS}=-20V,V_{GS}=0V			-1	μA
		V_{DS}=-20V,V_{GS}=0V,T_J= 85 °C			-30	μA
Gate Leakage Current	I_{GSS}	V_{GS}=±8V ,V_{DS}=0V			±10	μA
On-State Resistance	$R_{DS(on)}$[a]	V_{GS}=-4.5V,I_{DS}=-0.5A		0.35	0.55	Ω
		V_{GS}=-2.5V,I_{DS}=-0.2A		0.95	1.2	
		V_{GS}=-1.8V,I_{DS}=-0.04A		1.15	1.4	
		V_{GS}=-1.5V,I_{DS}=-0.01A		2		
Diode Characteristics						
Diode Forward Voltage	V_{SD}[a]	I_{SD}=-0.5A,V_{GS}=0V			1.3	V
Reverse Recovery Time	t_{rr}	I_{SD}=-0.5A dISD / dt = 100 A / μs		70		ns
Reverse Recovery Charge	Q_{rr}			68		nC
Dynamic Characteristics[b]						
Input capacitance	C_{iss}	V_{GS}=0V,V_{DS}=-10V, Frequency = 1 MHz		87		pF
Output capacitance	C_{oss}			15		pF
Reverse transfer capacitance	C_{rss}			8.2		pF
Turn-on Delay Time	$t_{d(on)}$	V_{DS}=-30V,V_{GEN}=-10V R_G= 25Ω, R_L=60Ω, I_{DS}=-0.67A		5.6		nS
Turn-on Rise Time	t_r			5.3		nS
Turn-Off Delay Time	$t_{d(off)}$			30		nS
Turn-Off Fall Time	t_f			21		nS
Gate Charge Characteristics[b]						
Total Gate Charge	Q_g	V_{DS}=-10V,V_{GS}=-4.5V,I_{DS}=-0.67A		1.8		pC
Gate-Source Charge	Q_{gs}			0.82		pC
Gate-Drain Charge	Q_{gd}			0.59		pC

Notes:
a : Pulse test ; pulse width≤300μs, duty cycle≤2 %
b : Guaranteed by design, not subject to production testing

PARAMETER CHARACTERISTIC CURVE

Figure1: Power Dissipation

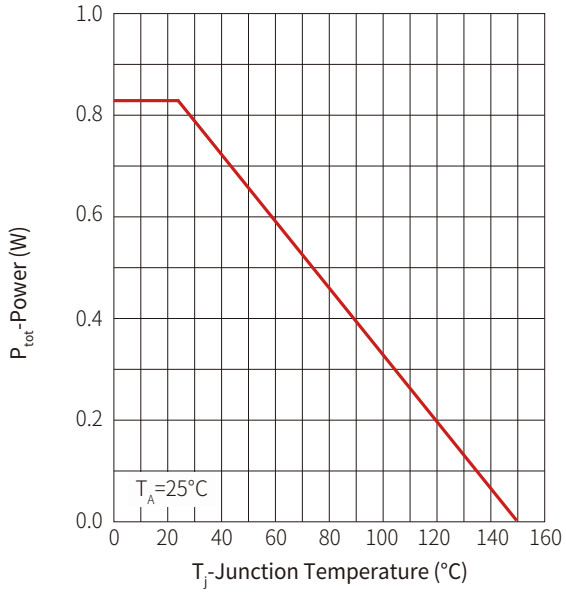


Figure2: Drain Current

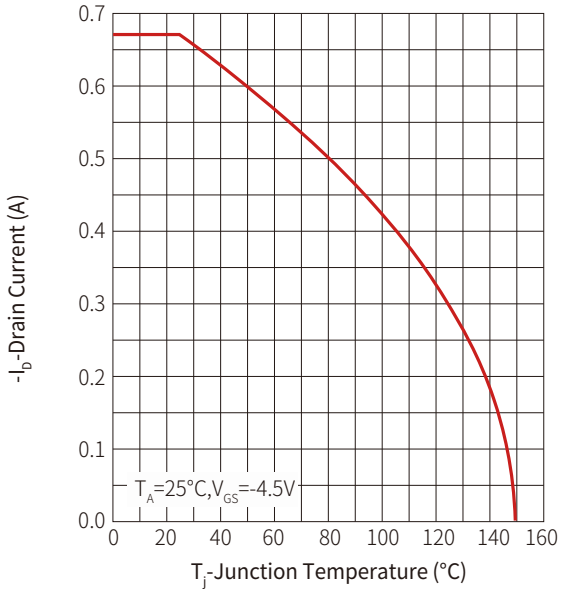


Figure3: Safe Operating Area

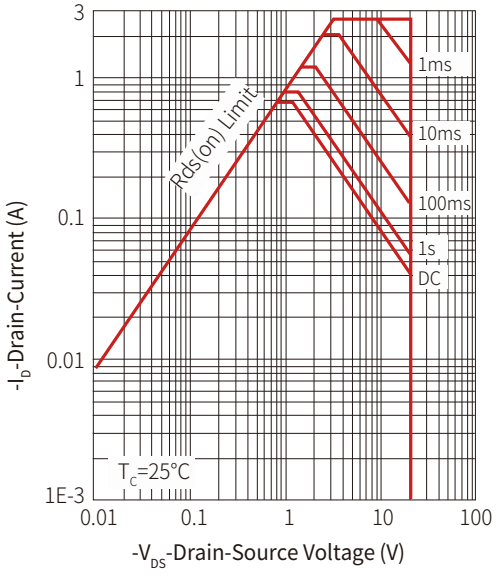


Figure 4: Thermal Transient Impedance

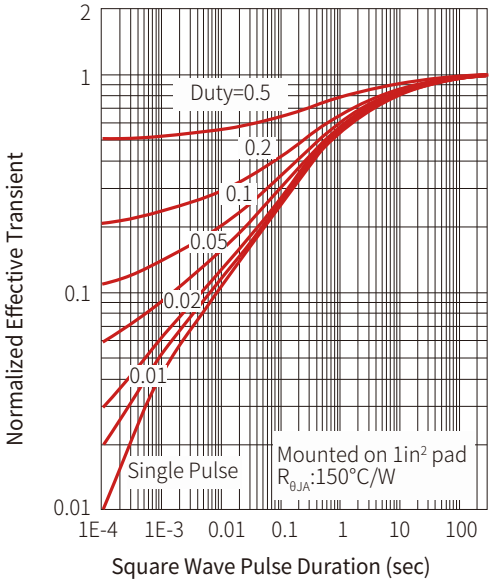


Figure 5:Output Characteristics

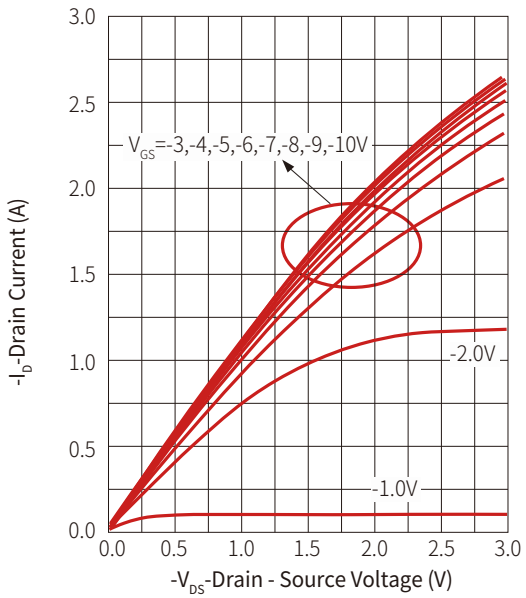


Figure 6: Drain-Source On Resistance

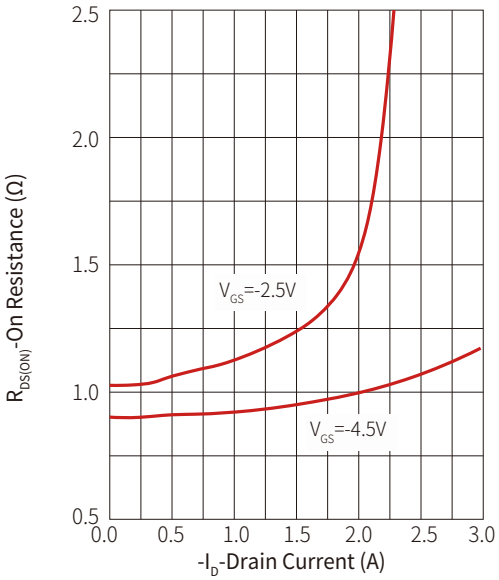


Figure 7:Transfer Characteristics

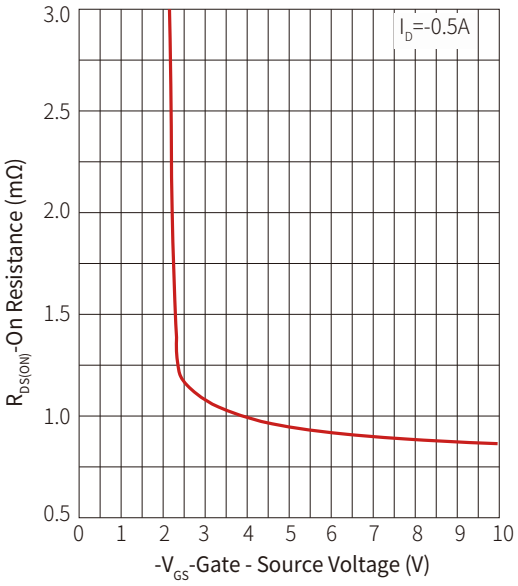


Figure 8: Gate Threshold Voltage

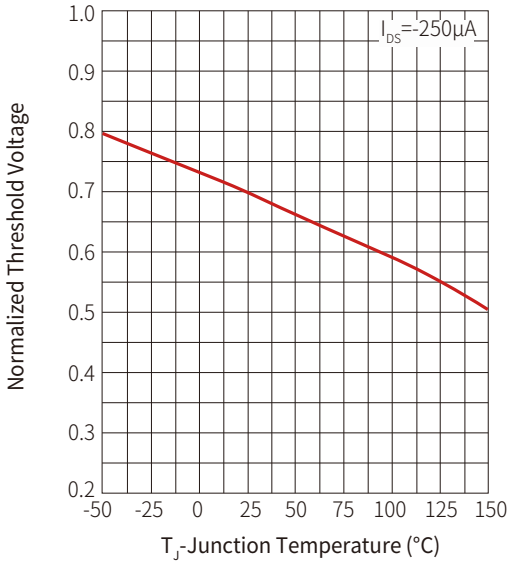


Figure 9:Drain-Source On Resistance

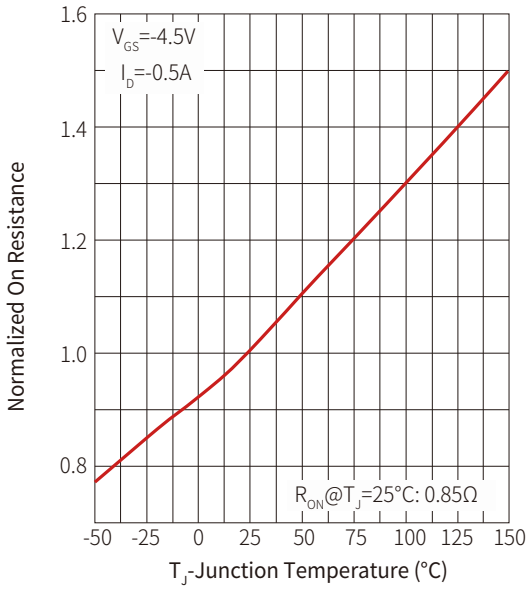


Figure 10: Source-Drain Diode Forward

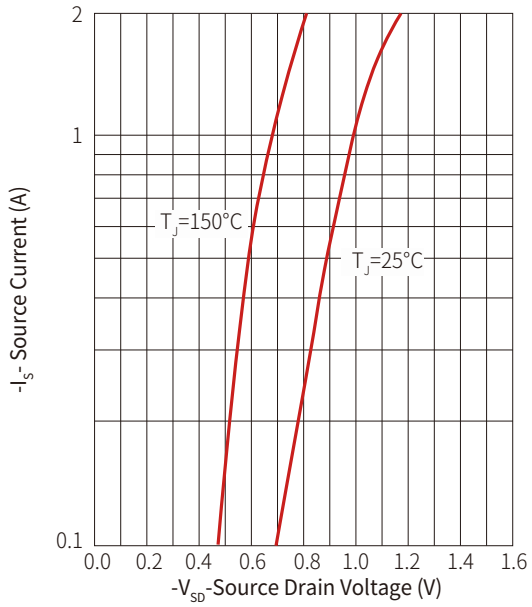


Figure 11:Capacitance

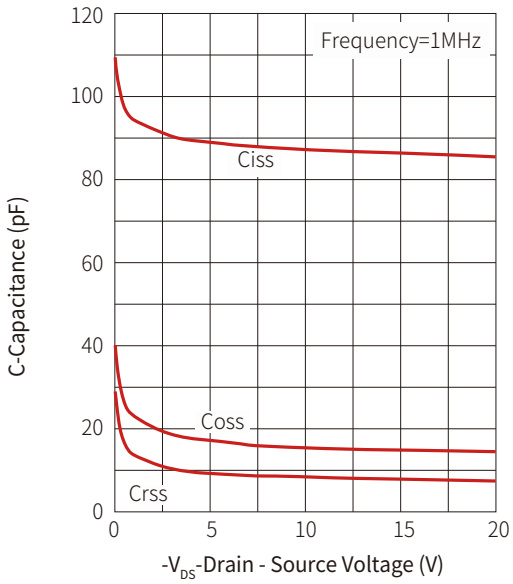
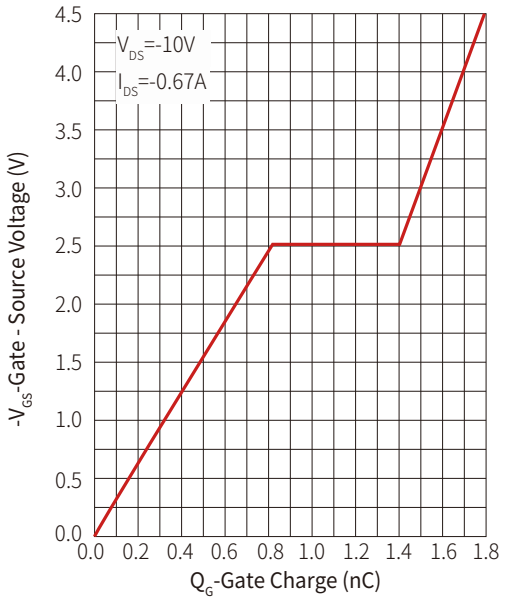
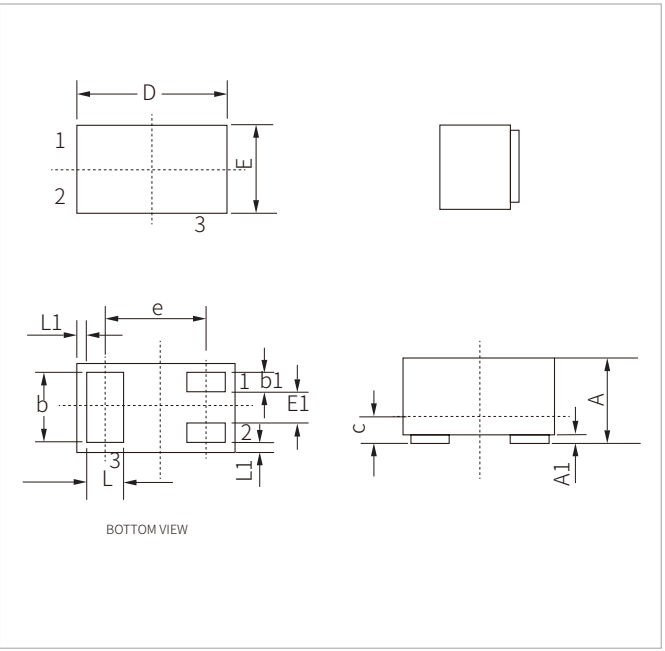


Figure 12: Gate Charge

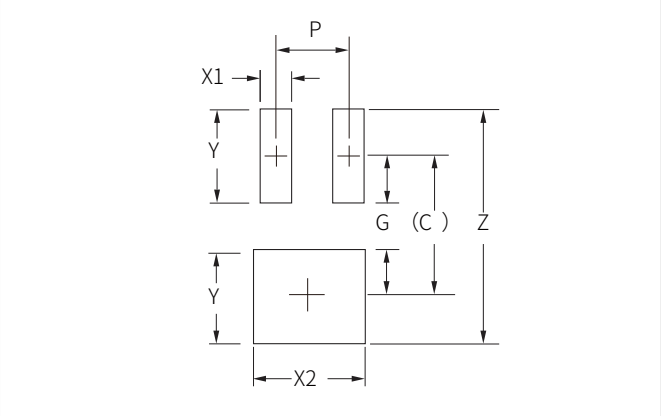


DFN1006-3L PACKAGE INFORMATION



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
SPM3139N1	DFN1006-3L	10000PCS	7”

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