

UN010N88DE

N-Channel Enhancement Mode MOSFET

ROHS

Product Summary

VDS	100V
ID	0.28A
RDSON(@VGS=10V ID=0.25A)	≤6Ω
RDSON(@VGS=4.5V ID=0.2A)	≤10Ω

Features

- ◆ Advanced Trench Process Technology
- ◆ Low Threshold Voltage
- ◆ Fast Switching Speed
- ◆ Halogen-Free & Lead-Free

Applications

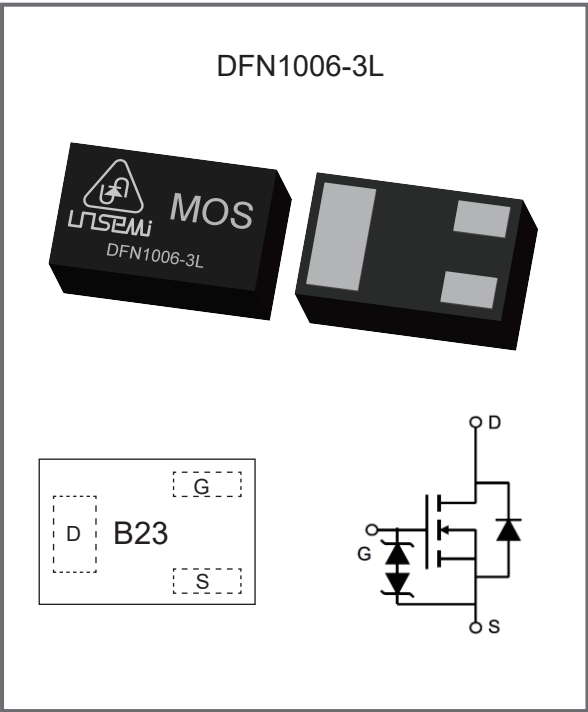
- ◆ Load Switch for Portable Devices
- ◆ Voltage Controlled Small Signal Switch

Package Marking And Ordering information

Part Number	Package Type	Packaging	Reel(pcs)
UN010N88DE	DFN1006-3L	Tape & Reel	10,000



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Absolute Maximum Ratings $T_A = 25^{\circ}\text{C}$ unless otherwise specified

Parameter	Symbol	Maximum	Units
Drain-Source Voltage	V_{DS}	100	V
Gate- Source Voltage	V_{GS}	± 20	V
Continuous Drain Current ¹⁾	I_D	0.28	A
Drain Current, Pulsed ²⁾	I_{DM}	1.8	A
Power Dissipation ¹⁾	P_{tot}	0.71	W
Operating Junction	T_J	$-55 \sim 150$	$^{\circ}\text{C}$
Storage Temperature Range	T_{stg}	$-55 \sim 150$	$^{\circ}\text{C}$

Thermal Characteristics

Parameter	Symbol	Max	Units
Thermal Resistance from Junction to Ambient ¹⁾	$R_{\theta JA}$	175	$^{\circ}\text{C/W}$

Note :

1) Part mounted on FR-4 board with recommended pad layout.

2) Pulse width $\leq 300\mu\text{s}$, Duty cycle $\leq 2\%$, limited by T_{jmax} .

Electrical Characteristics at TA = 25°C unless otherwise specified

Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
STATIC PARAMETERS						
Drain-Source Breakdown Voltage	BV _{DSS}	I _D = 250μA	100			V
Drain-Source Leakage Current	I _{DSS}	V _{GS} = 0V , V _{DS} = 80V			1.0	μA
Gate Leakage Current	I _{GSS}	V _{GS} = ±20V			±10	μA
Gate-Source Threshold Voltage	V _{GS(TH)}	V _{GS} = V _{DS} , I _D = 1mA	0.8		2.0	V
Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} = 10V , I _D = 0.25A		3.2	6.0	Ω
		V _{GS} = 4.5V , I _D = 0.2A		3.8	10	Ω
Body-Diode PARAMETERS						
Drain-Source Diode Forward Voltage	V _{SD}	I _S = 0.34A, V _{GS} = 0V			1.3	V
DYNAMIC PARAMETERS						
Forward Transconductance	g _{ts}	V _{DS} = 15V, I _D = 3.2A		370		S
Input Capacitance	C _{iss}	V _{GS} = 0V, V _{DS} = 25V F = 1MHz		22		pF
Output Capacitance	C _{oss}			3.5		pF
Reverse Transfer Capacitance	C _{rss}			2.0		pF
Gate charge total	Q _g	V _{DS} = 48V, V _{GS} = 10V I _{DS} = 0.5A		7.0		nC
Gate to Source Charge	Q _{gs}			1.4		nC
Gate to Drain Charge	Q _{gd}			2.5		nC
Turn-On Delay Time	t _{d(ON)}	V _{DD} = 30V, V _{GS} = 10V I _D = 0.28A, R _{GEN} = 50Ω		8.0		ns
Turn-On Rise Time	t _r			8.0		ns
Turn-Off Delay Time	t _{d(OFF)}			13		ns
Turn-Off Fall Time	t _f			16		ns

Electrical Characteristics Curves

Fig. 1 Output Characteristics

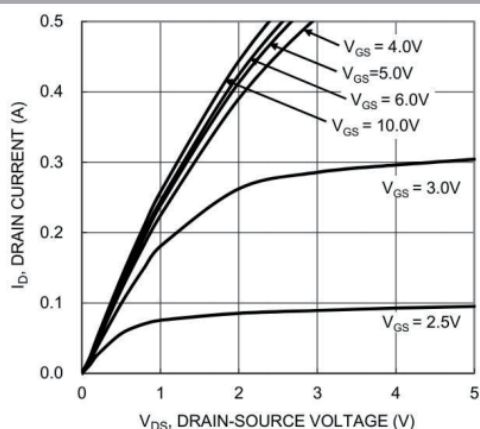


Fig. 2 Transfer Characteristic

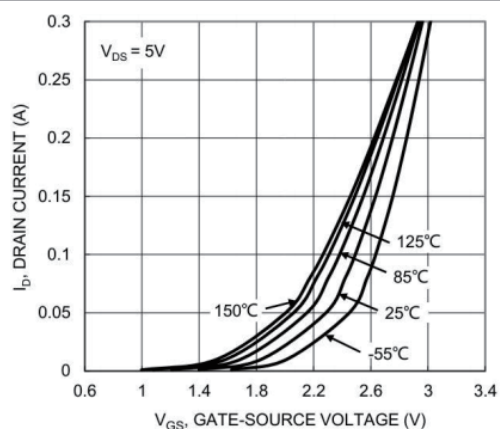


Fig. 3 $R_{DS(ON)}$ — I_D and V_{GS}

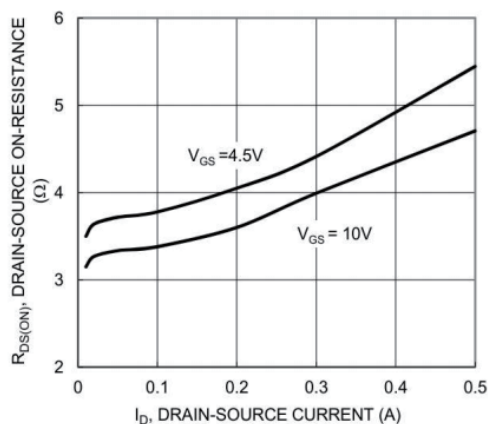


Fig. 4 $R_{DS(ON)}$ — V_{GS}

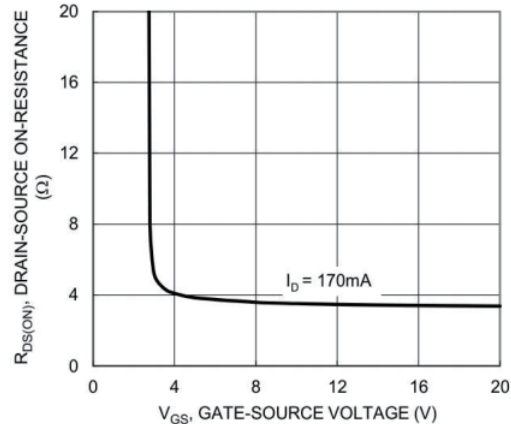


Fig. 5 $R_{DS(ON)}$ — I_D and T_J

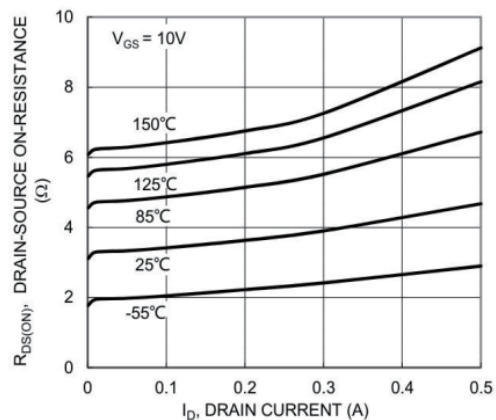
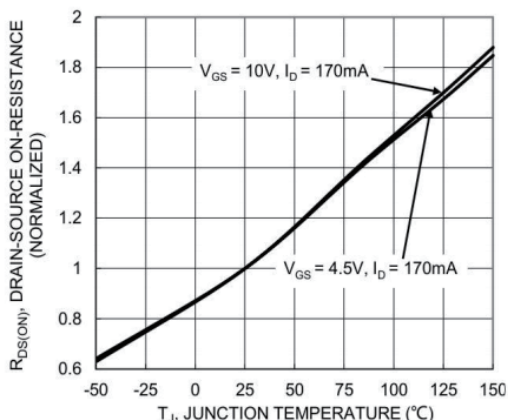


Fig. 6 Normalized $R_{DS(ON)}$ — T_J



Electrical Characteristics Curves

Fig. 7 $R_{DS(ON)} - T_J$

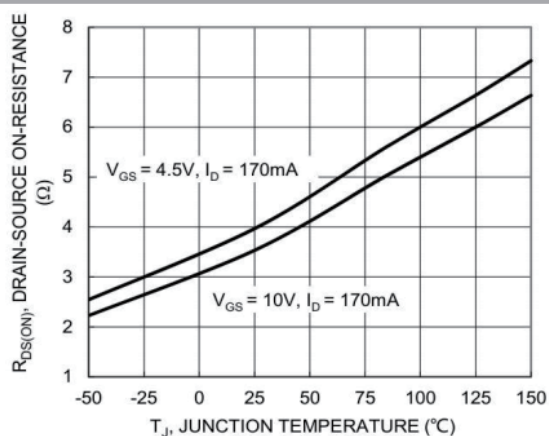


Fig. 8 $V_{GS(TH)} - T_J$

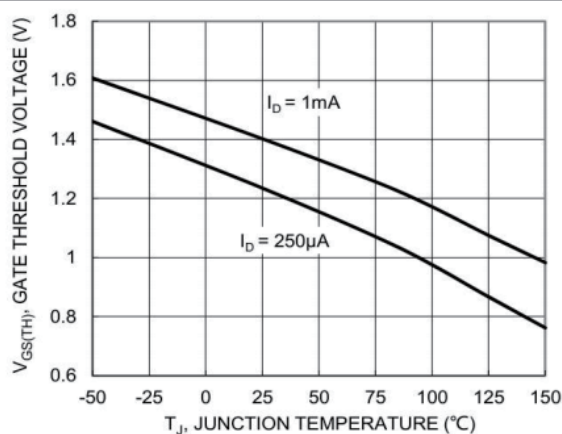


Fig. 9 $I_S - V_{SD}$

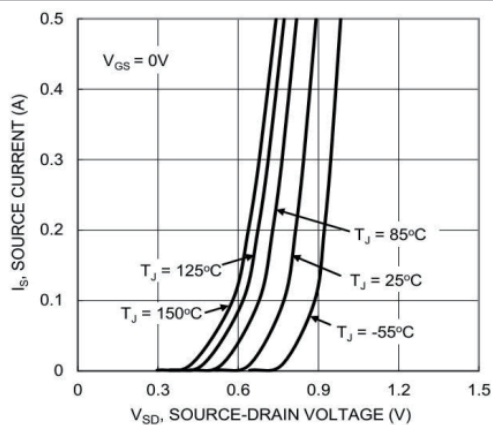


Fig. 10 Typical Junction Capacitance

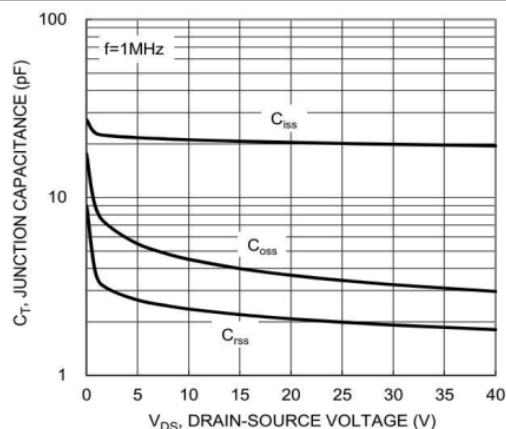
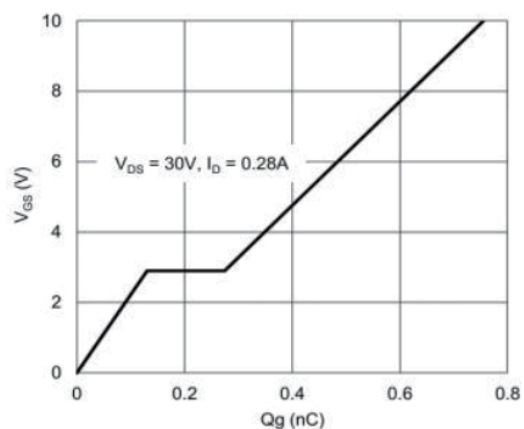
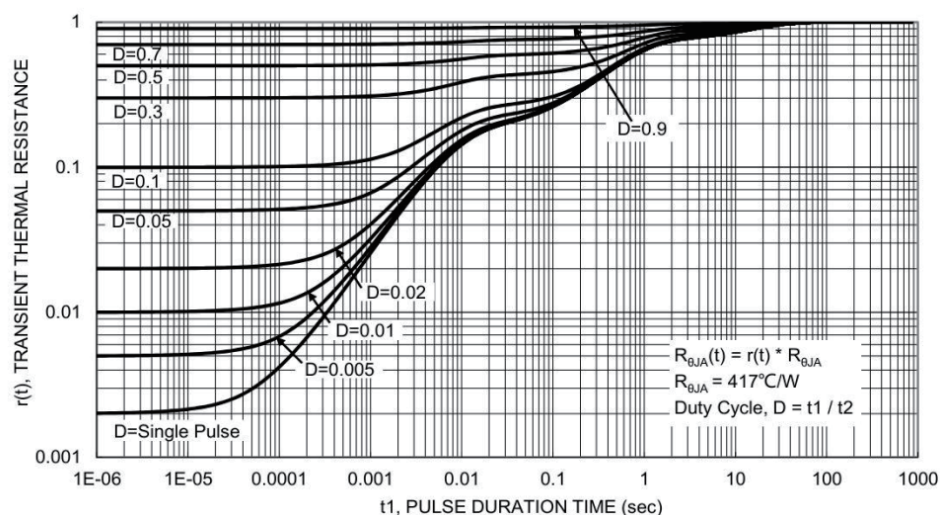


Fig. 11 Gate Charge



Electrical Characteristics Curves

Fig. 12 Transient Thermal Resistance



Test Circuit

Fig.1-1 Switching times test circuit

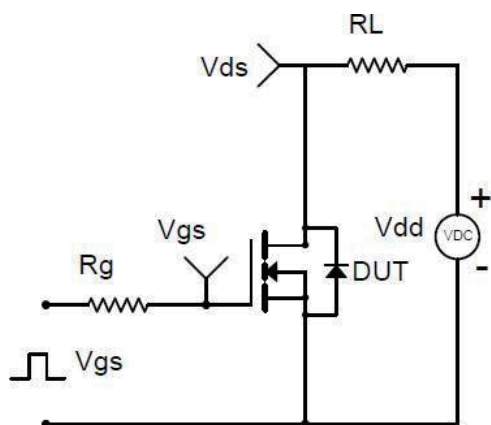


Fig.1-2 Switching Waveform

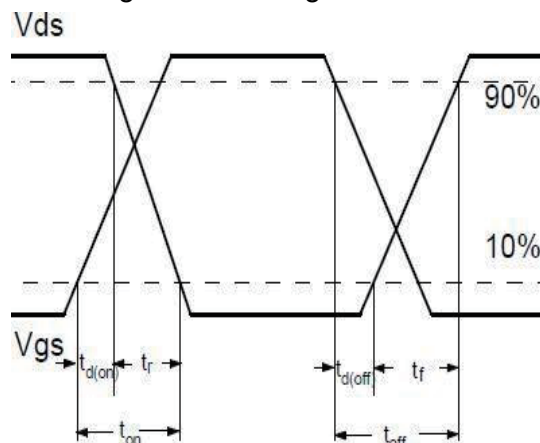


Fig.2-1 Gate charge test circuit

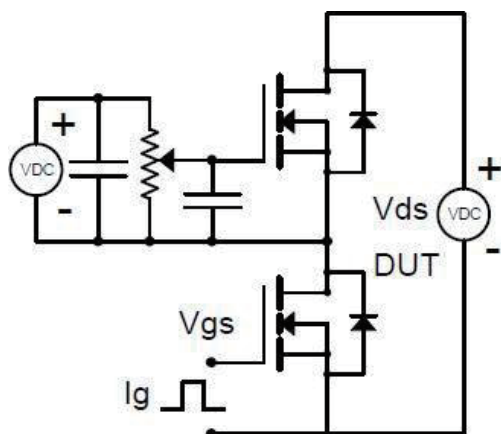


Fig.2-2 Gate charge waveform

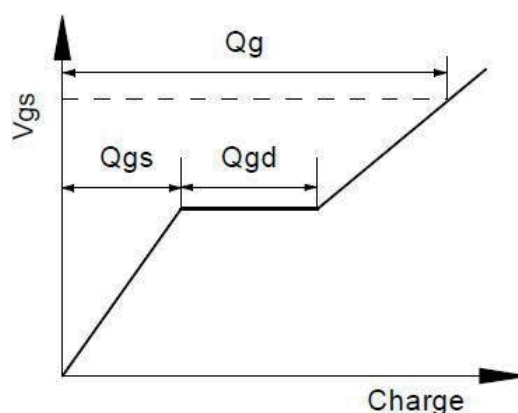


Fig.3-1 Avalanche test circuit

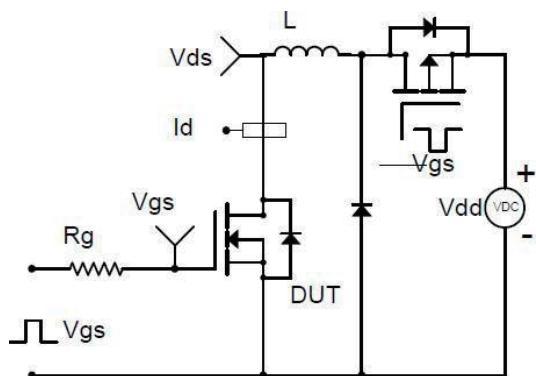
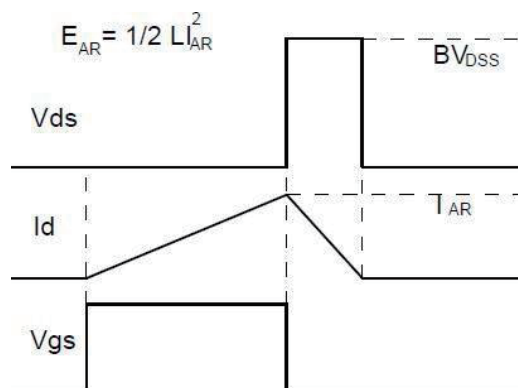
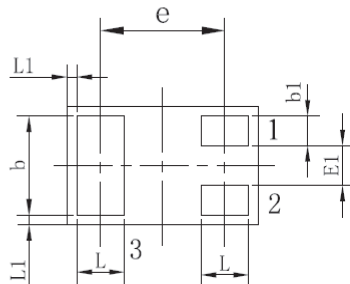
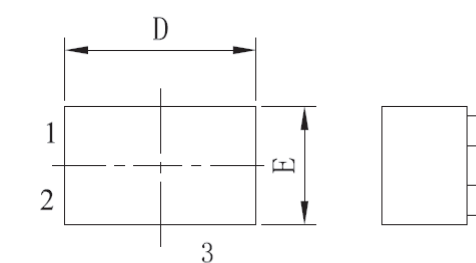


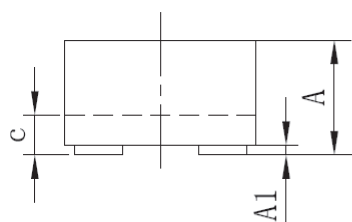
Fig.3-2 Avalanche waveform



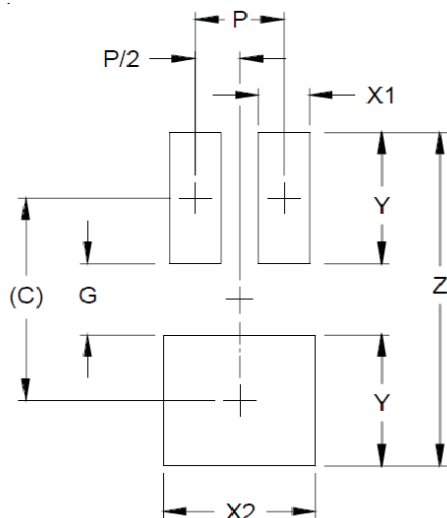
DFN1006P3 Package Outline & Dimensions (Units: mm / in)



BOTTOM VIEW



Symbol	Millimeters		
	Min.	Nom	Max.
A	0.45	0.50	0.55
A1	0	0.02	0.05
b	0.45	0.50	0.55
b1	0.10	0.15	0.20
c	0.12	0.15	0.18
D	0.95	1.00	1.05
e	0.65BSC		
E	0.55	0.60	0.65
E1	0.15	0.20	0.25
L	0.20	0.25	0.30
L1	0.05REF		



DIMENSIONS		
DIM	INCHES	MILLIMETERS
C	(0.033)	(0.85)
G	0.012	0.30
P	0.014	0.35
X	0.008	0.20
X2	0.024	0.60
Y	0.022	0.55
Z	0.055	1.40

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