

VN2222LL

Preferred Device

Small Signal MOSFET 150 mA, 60 Volts

N-Channel TO-92

Features

- Pb-Free Packages are Available*

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Drain-Source Voltage	V_{DSS}	60	Vdc
Drain-Gate Voltage ($R_{GS} = 1.0 \text{ M}\Omega$)	V_{DGR}	60	Vdc
Gate-Source Voltage	V_{GS}	± 20	Vdc
- Continuous	V_{GSM}	± 40	Vpk
- Non-repetitive ($t_p \leq 50 \mu\text{s}$)			
Drain Current	I_D	150	mAdc
- Continuous	I_{DM}	1000	
- Pulsed			
Total Power Dissipation @ $T_A = 25^\circ\text{C}$	P_D	400	mW
Derate above 25°C		3.2	mW/ $^\circ\text{C}$
Operating and Storage Temperature Range	T_J, T_{stg}	-55 to +150	$^\circ\text{C}$

Maximum ratings are those values beyond which device damage can occur. Maximum ratings applied to the device are individual stress limit values (not normal operating conditions) and are not valid simultaneously. If these limits are exceeded, device functional operation is not implied, damage may occur and reliability may be affected.

THERMAL CHARACTERISTICS

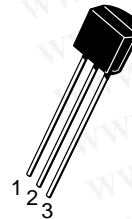
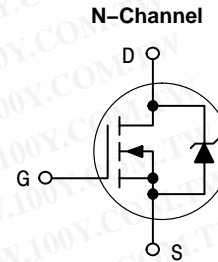
Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	312.5	$^\circ\text{C}/\text{W}$
Maximum Lead Temperature for Soldering Purposes, 1/16" from case for 10 seconds	T_L	300	$^\circ\text{C}$



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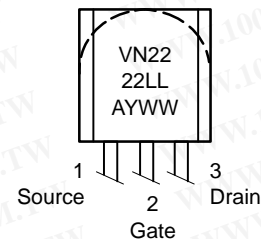
<http://onsemi.com>

150 mA, 60 V
 $R_{DS(on)} = 7.5 \Omega$



TO-92
 CASE 29
 STYLE 22

MARKING DIAGRAM & PIN ASSIGNMENT



A = Assembly Location
 Y = Year
 WW = Work Week

ORDERING INFORMATION

See detailed ordering and shipping information in the package dimensions section on page 2 of this data sheet.

Preferred devices are recommended choices for future use and best overall value.

*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

ELECTRICAL CHARACTERISTICS ($T_C = 25^\circ\text{C}$ unless otherwise noted)

Characteristic	Symbol	Min	Max	Unit
OFF CHARACTERISTICS				
Drain-Source Breakdown Voltage ($V_{GS} = 0, I_D = 100 \mu\text{Adc}$)	$V_{(BR)DSS}$	60	-	Vdc
Zero Gate Voltage Drain Current ($V_{DS} = 48 \text{ Vdc}, V_{GS} = 0$) ($V_{DS} = 48 \text{ Vdc}, V_{GS} = 0, T_J = 125^\circ\text{C}$)	I_{DSS}	-	10 500	μAdc
Gate-Body Leakage Current, Forward ($V_{GSF} = 30 \text{ Vdc}, V_{DS} = 0$)	I_{GSSF}	-	-100	nAdc

ON CHARACTERISTICS (Note 1)

Gate Threshold Voltage ($V_{DS} = V_{GS}, I_D = 1.0 \text{ mAdc}$)	$V_{GS(th)}$	0.6	2.5	Vdc
Static Drain-Source On-Resistance ($V_{GS} = 10 \text{ Vdc}, I_D = 0.5 \text{ Adc}$) ($V_{GS} = 10 \text{ Vdc}, I_D = 0.5 \text{ Vdc}, T_C = 125^\circ\text{C}$)	$r_{DS(on)}$	-	7.5 13.5	Ω
Drain-Source On-Voltage ($V_{GS} = 5.0 \text{ Vdc}, I_D = 200 \text{ mAdc}$) ($V_{GS} = 10 \text{ Vdc}, I_D = 500 \text{ mAdc}$)	$V_{DS(on)}$	-	1.5 3.75	Vdc
On-State Drain Current ($V_{GS} = 10 \text{ Vdc}, V_{DS} \geq 2.0 V_{DS(on)}$)	$I_{D(on)}$	750	-	mA
Forward Transconductance ($V_{DS} = 10 \text{ Vdc}, I_D = 500 \text{ mAdc}$)	g_{fs}	100	-	μmhos

DYNAMIC CHARACTERISTICS

Input Capacitance	$(V_{DS} = 25 \text{ Vdc}, V_{GS} = 0,$ $f = 1.0 \text{ MHz})$	C_{iss}	-	60	pF
Output Capacitance		C_{oss}	-	25	
Reverse Transfer Capacitance		C_{rss}	-	5.0	

SWITCHING CHARACTERISTICS (Note 1)

Turn-On Delay Time	$(V_{DD} = 15 \text{ Vdc}, I_D = 600 \text{ mA},$ $R_{gen} = 25 \Omega, R_L = 23 \Omega)$	t_{on}	-	10	ns
Turn-Off Delay Time		t_{off}	-	10	

1. Pulse Test: Pulse Width $\leq 300 \mu\text{s}$, Duty Cycle $\leq 2.0\%$.

ORDERING INFORMATION

Device	Package	Shipping†
VN2222LL	TO-92	1000 Unit / Box
VN2222LLG	TO-92 (Pb-Free)	1000 Unit / Box
VN2222LLRL	TO-92	1000 Unit / Box
VN2222LLRLRA	TO-92	2000 Tape & Reel
VN2222LLRLRAG	TO-92 (Pb-Free)	2000 Tape & Reel
VN2222LLRLRM	TO-92	2000 Unit / Ammo Box

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

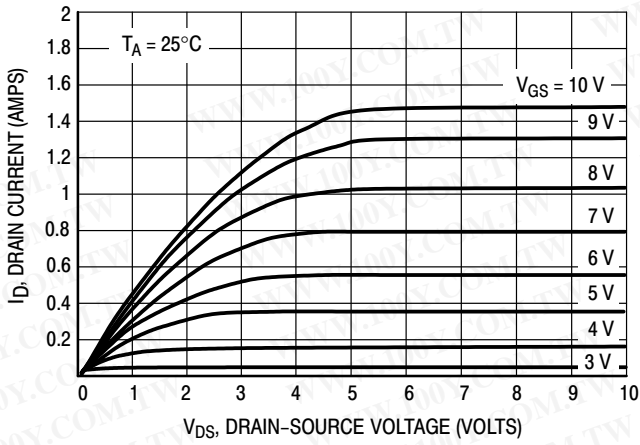


Figure 1. Ohmic Region

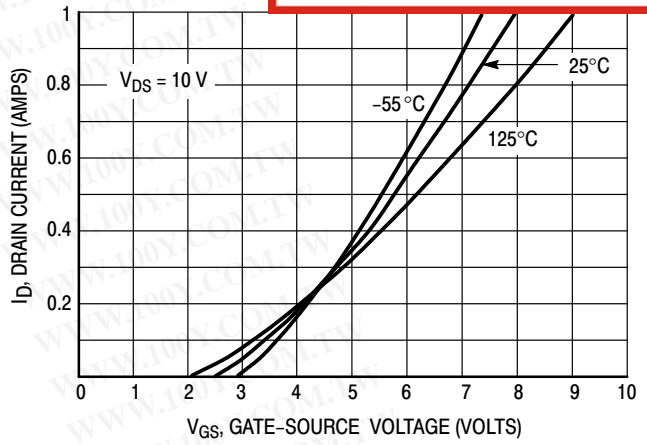


Figure 2. Transfer Characteristics

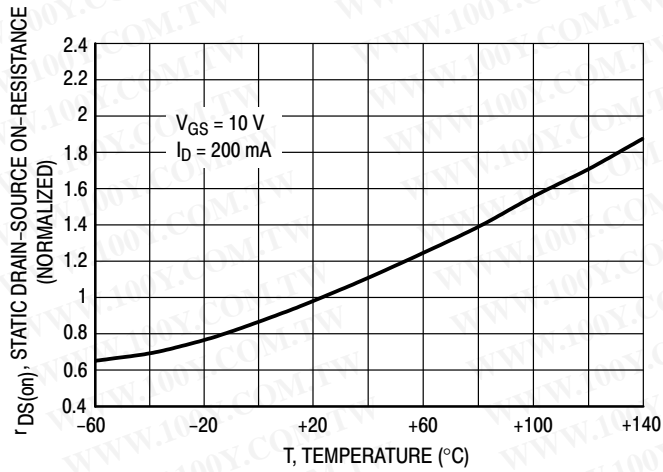


Figure 3. Temperature versus Static Drain-Source On-Resistance

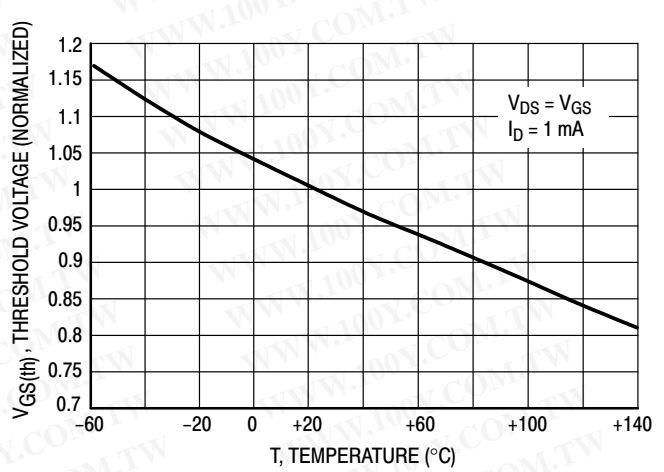


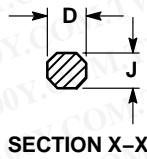
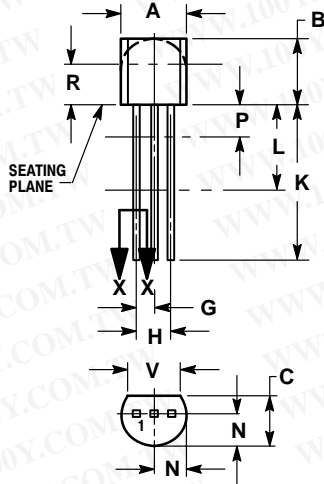
Figure 4. Temperature versus Gate Threshold Voltage

VN2222LL

PACKAGE DIMENSIONS

TO-92
CASE 29-11
ISSUE AL

勝特力材料 886-3-5753170
勝特力电子(上海) 86-21-34970699
勝特力电子(深圳) 86-755-83298787
[Http://www.100y.com.tw](http://www.100y.com.tw)



NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. CONTOUR OF PACKAGE BEYOND DIMENSION R IS UNCONTROLLED.
4. LEAD DIMENSION IS UNCONTROLLED IN P AND BEYOND DIMENSION K MINIMUM.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.175	0.205	4.45	5.20
B	0.170	0.210	4.32	5.33
C	0.125	0.165	3.18	4.19
D	0.016	0.021	0.407	0.533
G	0.045	0.055	1.15	1.39
H	0.095	0.105	2.42	2.66
J	0.015	0.020	0.39	0.50
K	0.500	---	12.70	---
L	0.250	---	6.35	---
N	0.080	0.105	2.04	2.66
P	---	0.100	---	2.54
R	0.115	---	2.93	---
V	0.135	---	3.43	---

STYLE 22:

1. SOURCE
2. GATE
3. DRAIN

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