VN2222LL

Preferred Device

Small Signal MOSFET 150 mAmps, 60 Volts

N−Channel TO−92

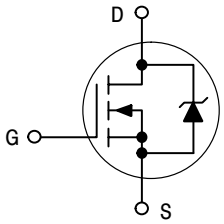
ON Semiconductor®

Features

- Pb−Free Packages are Available*

150 mA, 60 V
$R_{DS(on)}$ = 7.5 Ω

N−Channel



MAXIMUM RATINGS

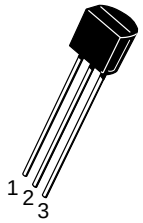
Rating	Symbol	Value	Unit
Drain−Source Voltage	V_{DSS}	60	Vdc
Drain−Gate Voltage (R_{GS} = 1.0 MΩ)	V_{DGR}	60	Vdc
Gate−Source Voltage − Continuous − Non−repetitive ($t_p \le 50$ μs)	 V_{GS} V_{GSM}	 ±20 ±40	 Vdc Vpk
Drain Current − Continuous − Pulsed	 I_D I_{DM}	 150 1000	mAdc
Total Power Dissipation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

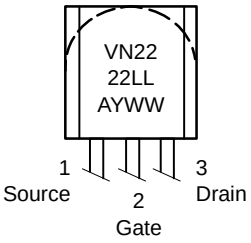
Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction−to−Ambient	$R_{\theta JA}$	312.5	°C/W
Maximum Lead Temperature for Soldering Purposes, 1/16″ from case for 10 seconds	T_L	300	°C

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



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.

Publication Order Number:
VN2222LL/D

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

Characteristic	Symbol	Min	Max	Unit
OFF CHARACTERISTICS				
Drain−Source Breakdown Voltage (V_{GS} = 0, I_D = 100 μAdc)	$V_{(BR)DSS}$	60	−	Vdc
Zero Gate Voltage Drain Current (V_{DS} = 48 Vdc, V_{GS} = 0) (V_{DS} = 48 Vdc, V_{GS} = 0, T_J = 125°C)	I_{DSS}	− −	10 500	μAdc
Gate−Body Leakage Current, Forward (V_{GSF} = 30 Vdc, V_{DS} = 0)	I_{GSSF}	−	−100	nAdc
ON CHARACTERISTICS (Note 1)				
Gate Threshold Voltage (V_{DS} = V_{GS}, I_D = 1.0 mAdc)	$V_{GS(th)}$	0.6	2.5	Vdc
Static Drain−Source On−Resistance (V_{GS} = 10 Vdc, I_D = 0.5 Adc) (V_{GS} = 10 Vdc, I_D = 0.5 Vdc, T_C = 125°C)	$r_{DS(on)}$	− −	7.5 13.5	Ω
Drain−Source On−Voltage (V_{GS} = 5.0 Vdc, I_D = 200 mAdc) (V_{GS} = 10 Vdc, I_D = 500 mAdc)	$V_{DS(on)}$	− −	1.5 3.75	Vdc
On−State Drain Current (V_{GS} = 10 Vdc, $V_{DS} \geq$ 2.0 $V_{DS(on)}$)	$I_{D(on)}$	750	−	mA
Forward Transconductance (V_{DS} = 10 Vdc, I_D = 500 mAdc)	g_{fs}	100	−	μmhos
DYNAMIC CHARACTERISTICS				
Input Capacitance	(V_{DS} = 25 Vdc, V_{GS} = 0, f = 1.0 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 Vdc, I_D = 600 mA, R_{gen} = 25 Ω, R_L = 23 Ω)	t_{on}	−	10	ns
Turn−Off Delay Time		t_{off}	−	10	

1. Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle ≤ 2.0%.

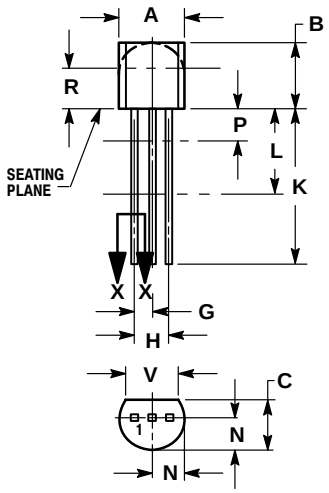
ORDERING INFORMATION

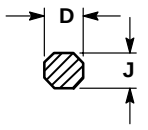
Device	Package	Shipping†
VN2222LL	TO−92	1000 Unit / Box
VN2222LLG	TO−92 (Pb−Free)	1000 Unit / Box
VN2222LLRL	TO−92	1000 Unit / Box
VN2222LLRLRA	TO−92	2000 Tape & Reel
VN2222LLRLRAG	TO−92 (Pb−Free)	2000 Tape & Reel
VN2222LLRLRM	TO−92	2000 Unit / Ammo Box

†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.

PACKAGE DIMENSIONS

TO−92
CASE 29−11
ISSUE AL





SECTION X−X

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.

	INCHES		MILLIMETERS	
DIM	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:
PIN 1. SOURCE
2. GATE
3. DRAIN