3LN01M

Small Signal MOSFET
30V, 3.7Ω, 0.15A, Single N-Channel

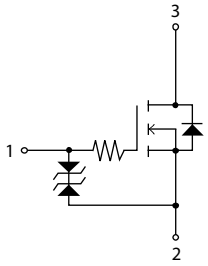
ON Semiconductor®

www.onsemi.com

Features

- Low ON-Resistance
- Ultrahigh-Speed Switching
- 1.5V Drive
- Halogen Free Compliance

Electrical Connection
N-Channel



1:Gate
2:Source
3:Drain

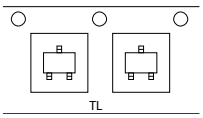
Specifications

Absolute Maximum Ratings at Ta = 25°C

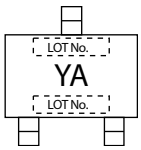
Parameter	Symbol	Value	Unit
Drain to Source Voltage	V_{DSS}	30	V
Gate to Source Voltage	V_{GSS}	±10	V
Drain Current (DC)	I_D	0.15	A
Drain Current (Pulse) PW≤10μs, duty cycle≤1%	I_{DP}	0.6	A
Power Disspation	P_D	0.15	W
Junction Temperature	Tj	150	°C
Storage Temperature	Tstg	–55 to +150	°C

This product is designed to “ESD immunity < 200V*”, so please take care when handling.
* Machine Model

Packing Type:TL



Marking



Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

Electrical Characteristics at Ta = 25°C

Parameter	Symbol	Conditions	Value			Unit
			min	typ	max	
Drain to Source Breakdown Voltage	$V_{(BR)DSS}$	I_D=1mA, V_{GS}=0V	30			V
Zero-Gate Voltage Drain Current	I_{DSS}	V_{DS}=30V, V_{GS}=0V			1	μA
Gate to Source Leakage Current	I_{GSS}	V_{GS}=±8V, V_{DS}=0V			±10	μA
Gate Threshold Voltage	V_{GS}(th)	V_{DS}=10V, I_D=100μA	0.4		1.3	V
Forward Transconductance	g_{FS}	V_{DS}=10V, I_D=80mA	0.15	0.22		S

Continued on next page.

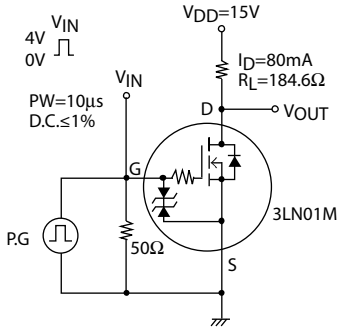
ORDERING INFORMATION
See detailed ordering and shipping information on page 5 of this data sheet.

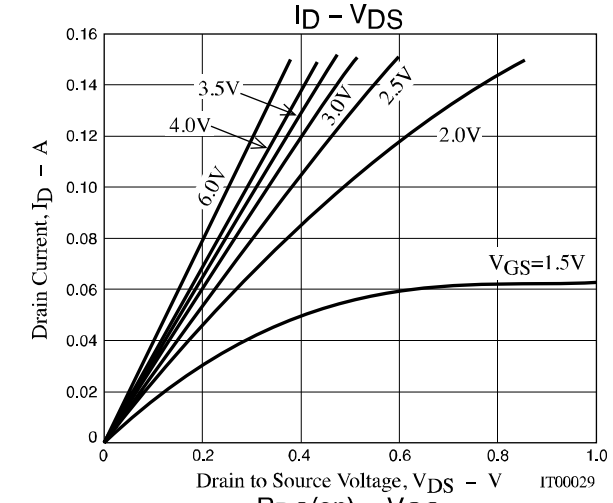
Continued from preceding page.

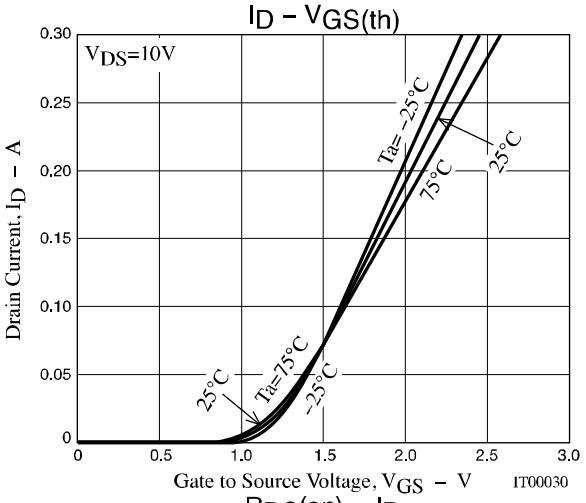
Parameter	Symbol	Conditions	Value			Unit
			min	typ	max	
Static Drain to Source On-State Resistance	$R_{DS}(on)1$	I_D=80mA, V_{GS}=4V		2.9	3.7	Ω
	$R_{DS}(on)2$	I_D=40mA, V_{GS}=2.5V		3.7	5.2	Ω
	$R_{DS}(on)3$	I_D=10mA, V_{GS}=1.5V		6.4	12.8	Ω
Input Capacitance	Ciss	V_{DS}=10V, f=1MHz		7.0		pF
Output Capacitance	Coss			5.9		pF
Reverse Transfer Capacitance	Crss			2.3		pF
Turn-ON Delay Time	$t_d(on)$	See specified Test Circuit		19		ns
Rise Time	t_r			65		ns
Turn-OFF Delay Time	$t_d(off)$			155		ns
Fall Time	t_f			120		ns
Total Gate Charge	Qg	V_{DS}=10V, V_{GS}=10V, I_D=150mA		1.58		nC
Gate to Source Charge	Qgs			0.26		nC
Gate to Drain “Miller” Charge	Qgd			0.31		nC
Forward Diode Voltage	V_{SD}	I_S=150mA, V_{GS}=0V		0.87	1.2	V

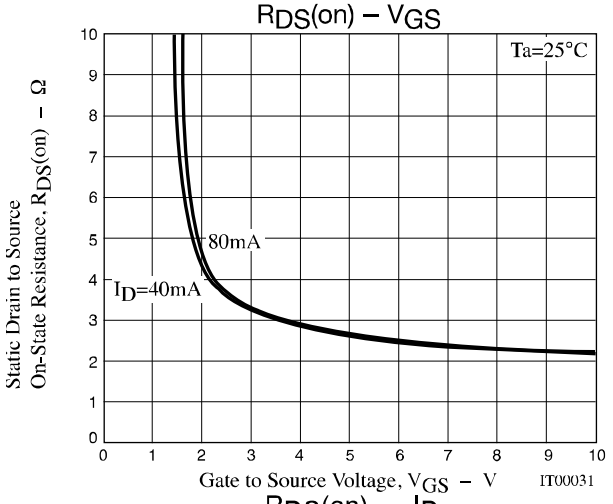
Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

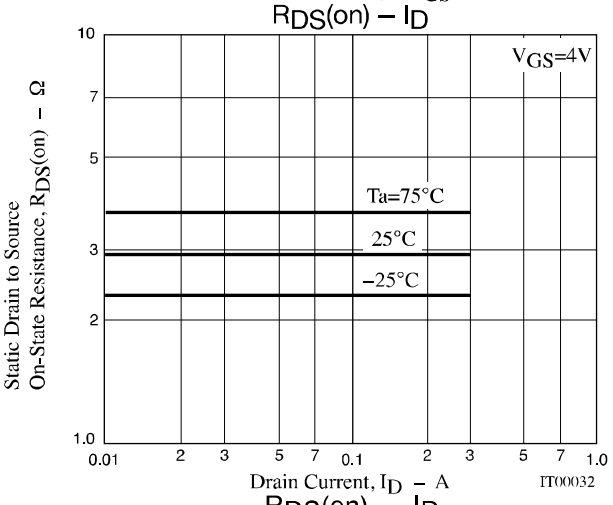
Switching Time Test Circuit

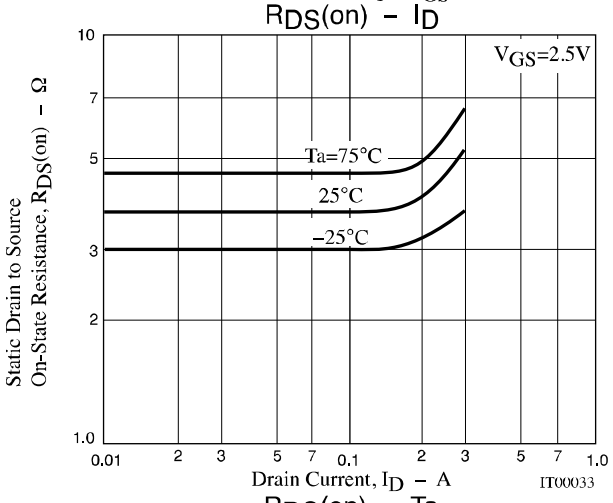


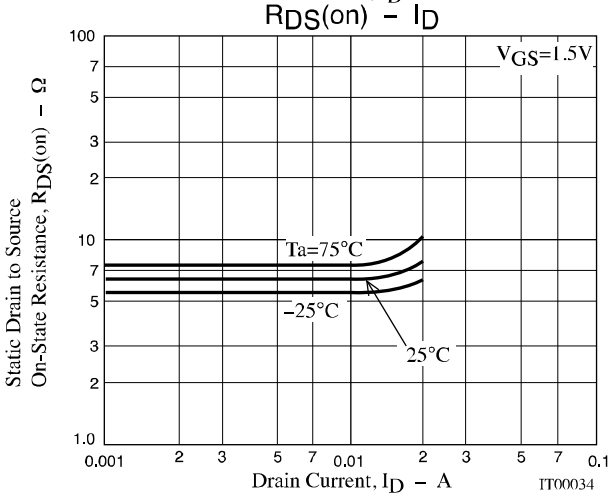

ID – VDS
Drain Current, ID – A
Drain to Source Voltage, VDS – V
3.5V
4.0V
3.0V
2.5V
2.0V
6.0V
VGS=1.5V
IT00029

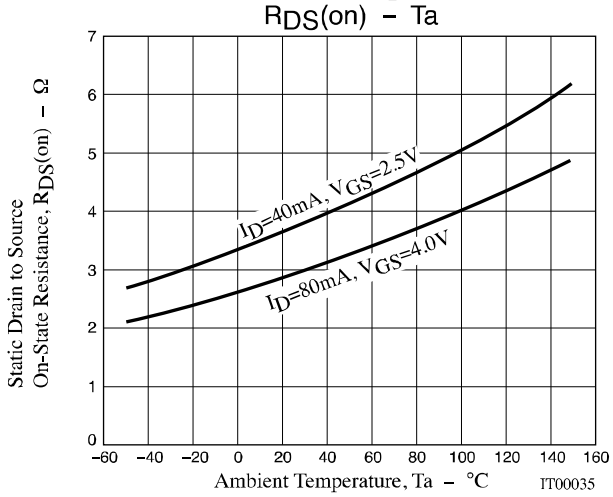

ID – VGS(th)
VDS=10V
Drain Current, ID – A
Gate to Source Voltage, VGS – V
Ta=–25°C
75°C
25°C
25°C
Ta=75°C
–25°C
IT00030

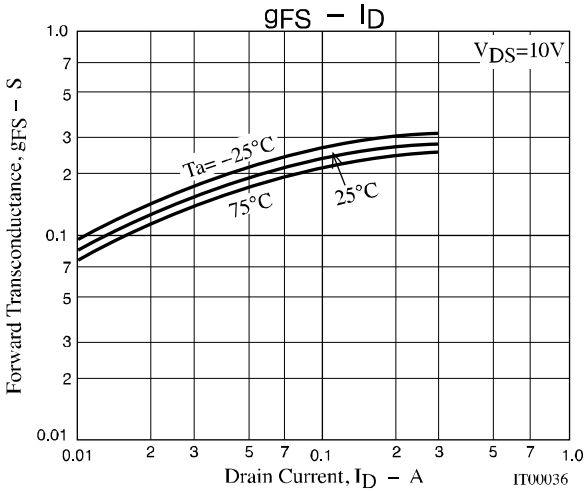

RDS(on) – VGS
Ta=25°C
Static Drain to Source On-State Resistance, RDS(on) – Ω
Gate to Source Voltage, VGS – V
80mA
ID=40mA
IT00031

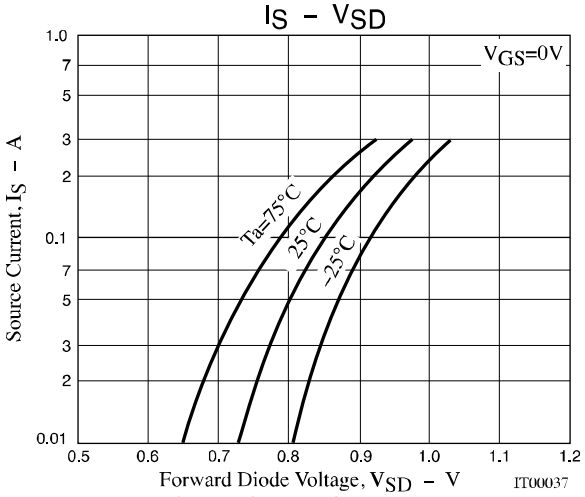

RDS(on) – ID
VGS=4V
Static Drain to Source On-State Resistance, RDS(on) – Ω
Drain Current, ID – A
Ta=75°C
25°C
–25°C
IT00032

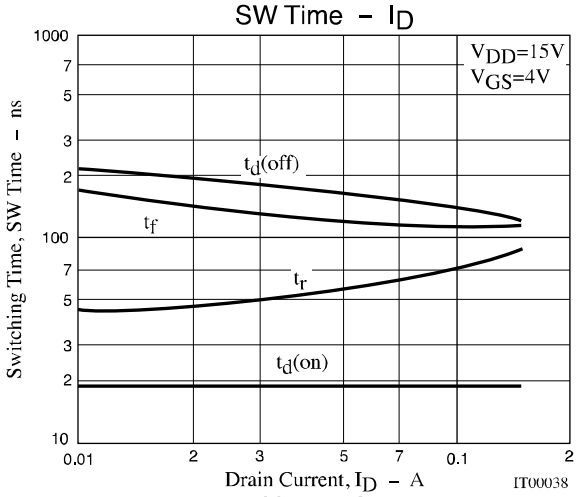

RDS(on) – ID
VGS=2.5V
Static Drain to Source On-State Resistance, RDS(on) – Ω
Drain Current, ID – A
Ta=75°C
25°C
–25°C
IT00033

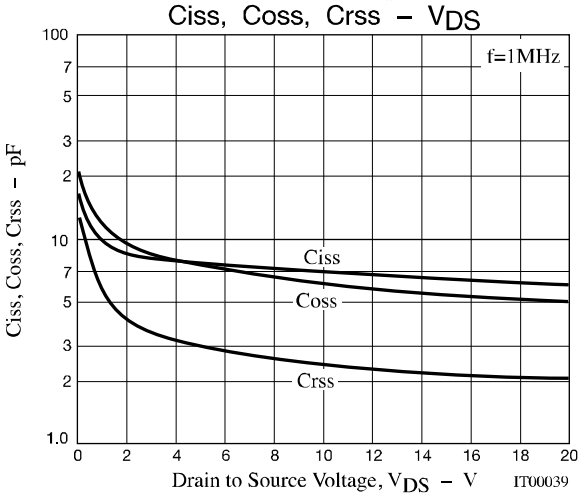

RDS(on) – ID
VGS=1.5V
Static Drain to Source On-State Resistance, RDS(on) – Ω
Drain Current, ID – A
Ta=75°C
–25°C
25°C
IT00034

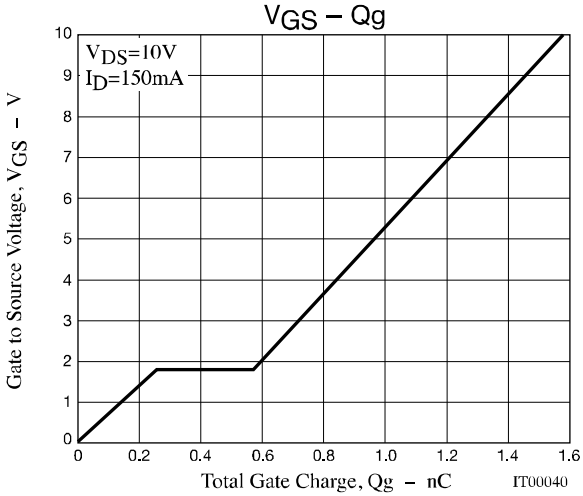

RDS(on) – Ta
Static Drain to Source On-State Resistance, RDS(on) – Ω
Ambient Temperature, Ta – °C
ID=40mA, VGS=2.5V
ID=80mA, VGS=4.0V
IT00035

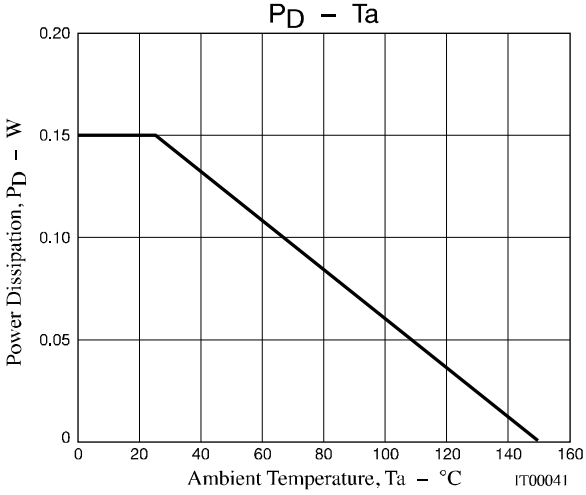

gFS – ID
VDS=10V
Forward Transconductance, gFS – S
Drain Current, ID – A
Ta=–25°C
75°C
25°C
IT00036


IS – VSD
VGS=0V
Ta=75°C
25°C
–25°C
Source Current, IS – A
Forward Diode Voltage, VSD – V
IT00037


SW Time – ID
VDD=15V
VGS=4V
td(off)
tf
tr
td(on)
Switching Time, SW Time – ns
Drain Current, ID – A
IT00038


Ciss, Coss, Crss – VDS
f=1MHz
Ciss
Coss
Crss
Ciss, Coss, Crss – pF
Drain to Source Voltage, VDS – V
IT00039


VGS – Qg
VDS=10V
ID=150mA
Gate to Source Voltage, VGS – V
Total Gate Charge, Qg – nC
IT00040


PD – Ta
Power Dissipation, PD – W
Ambient Temperature, Ta – °C
IT00041

Package Dimensions

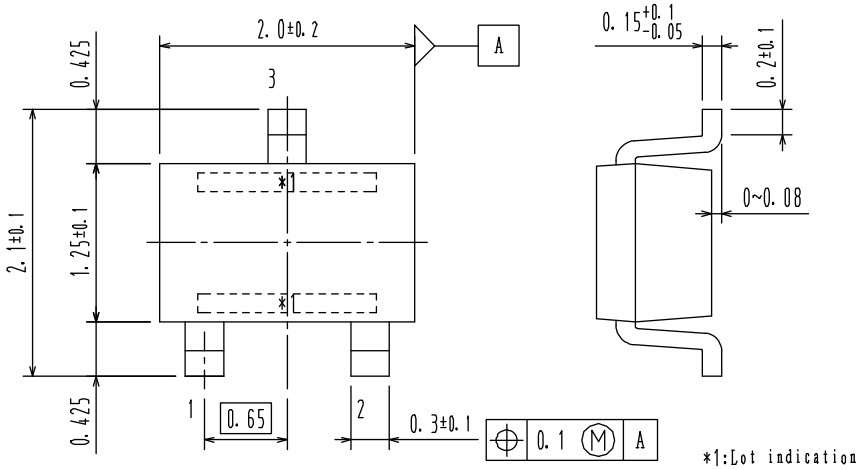
3LN01M-TL-E/ 3LN01M-TL-H

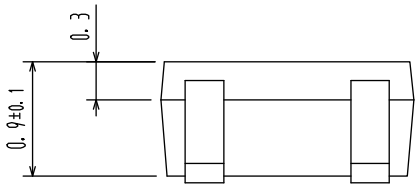
SC-70/MCP3

CASE 419AJ
ISSUE O

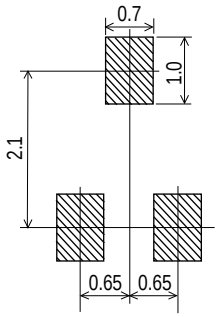
Unit : mm

1 : Gate
2 : Source
3 : Drain





Recommended Soldering Footprint



ORDERING INFORMATION

Device	Package	Shipping	Note
3LN01M-TL-E	MCP3 SC-70,SOT-323	3,000 pcs. / reel	Pb-Free
3LN01M-TL-H			Pb-Free and Halogen Free

Note on usage : Since the 3LN01M is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.