Ordering number : EN6137C

5LN01M

N-Channel Small Signal MOSFET
50V, 0.1A, 7.8Ω, Single MCP

ON Semiconductor®

http://onsemi.com

Features

- Low ON-resistance
- Ultrahigh-speed switching
- 1.5V drive

Specifications

Absolute Maximum Ratings at Ta=25°C

Parameter	Symbol	Conditions	Ratings	Unit
Drain to Source Voltage	V_{DSS}		50	V
Gate to Source Voltage	V_{GSS}		±10	V
Drain Current (DC)	I_D		0.1	A
Drain Current (Pulse)	I_{DP}	PW≤10μs, duty cycle≤1%	0.4	A
Allowable Power Dissipation	P_D		0.15	W
Channel Temperature	Tch		150	°C
Storage Temperature	Tstg		−55 to +150	°C

This product is designed to "ESD immunity < 200V*", so please take care when handling.

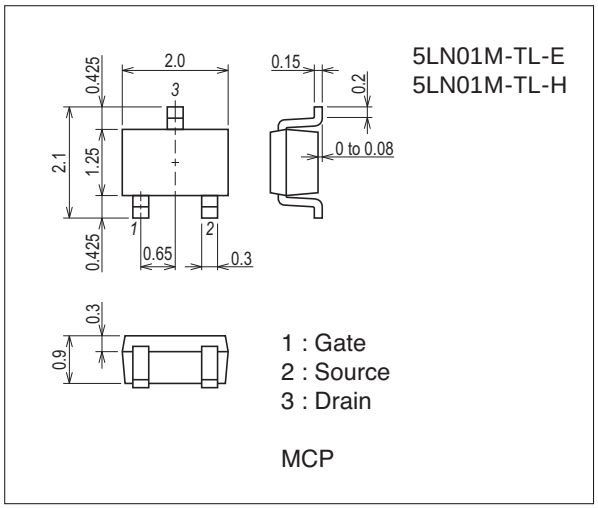
* Machine Model

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

Package Dimensions

unit : mm (typ)

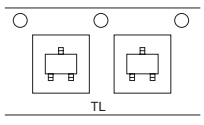
7023A-010



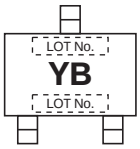
Ordering & Package Information

Device	Package	Shipping	memo
5LN01M-TL-E	MCP SC-70, SOT-323	3,000pcs./reel	Pb-Free
5LN01M-TL-H	MCP SC-70, SOT-323	3,000pcs./reel	Pb-Free and Halogen Free

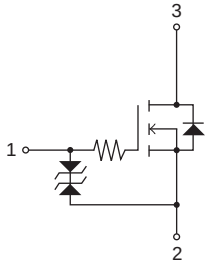
Packing Type: TL



Marking



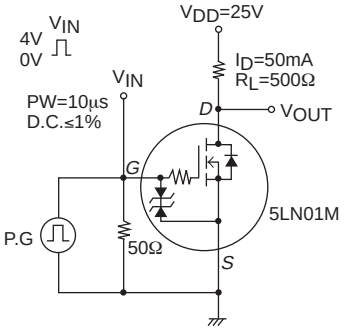
Electrical Connection

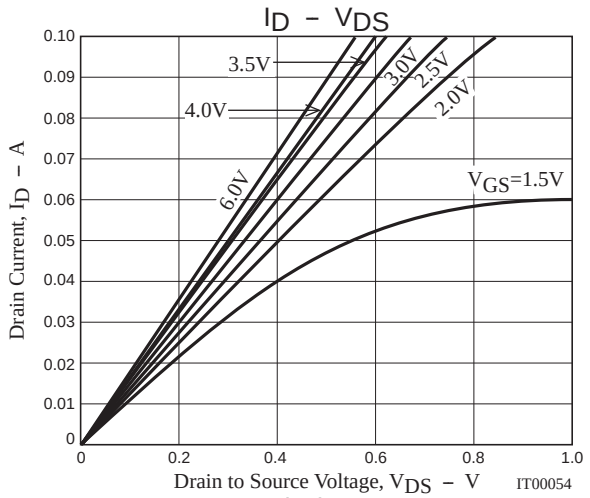


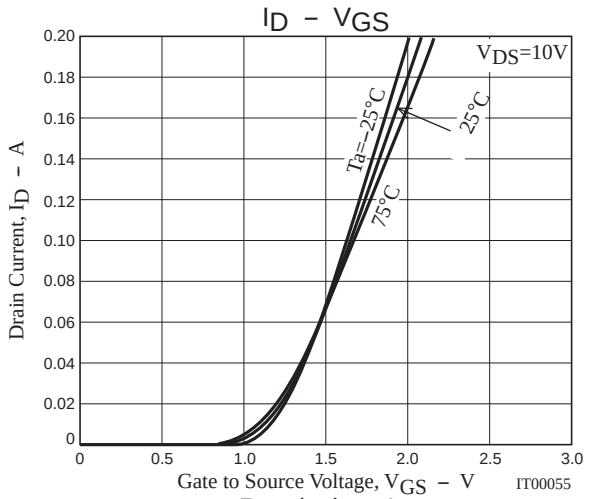
Electrical Characteristics at Ta=25°C

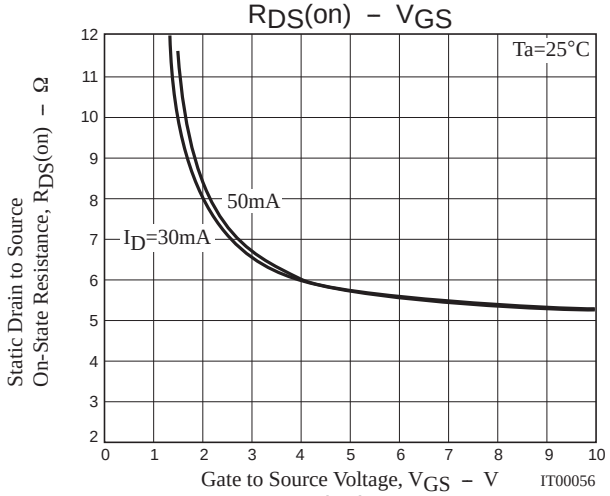
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Drain to Source Breakdown Voltage	$V_{(BR)DSS}$	I_D=1mA, V_{GS}=0V	50			V
Zero-Gate Voltage Drain Current	I_{DSS}	V_{DS}=50V, V_{GS}=0V			1	μA
Gate to Source Leakage Current	I_{GSS}	V_{GS}=±8V, V_{DS}=0V			±10	μA
Cutoff Voltage	V_{GS}(off)	V_{DS}=10V, I_D=100μA	0.4		1.3	V
Forward Transfer Admittance	| yfs |	V_{DS}=10V, I_D=50mA	0.13	0.18		S
Static Drain to Source On-State Resistance	R_{DS}(on)1	I_D=50mA, V_{GS}=4V		6	7.8	Ω
	R_{DS}(on)2	I_D=30mA, V_{GS}=2.5V		7.1	9.9	Ω
	R_{DS}(on)3	I_D=10mA, V_{GS}=1.5V		10	20	Ω
Input Capacitance	Ciss	V_{DS}=10V, f=1MHz		6.6		pF
Output Capacitance	Coss			4.7		pF
Reverse Transfer Capacitance	Crss			1.7		pF
Turn-ON Delay Time	t_{d}(on)	See specified Test Circuit.		18		ns
Rise Time	t_r			42		ns
Turn-OFF Delay Time	t_{d}(off)			190		ns
Fall Time	t_f			105		ns
Total Gate Charge	Qg	V_{DS}=10V, V_{GS}=10V, I_D=100mA		1.57		nC
Gate to Source Charge	Qgs			0.20		nC
Gate to Drain “Miller” Charge	Qgd			0.32		nC
Diode Forward Voltage	V_{SD}	I_S=100mA, V_{GS}=0V		0.85	1.2	V

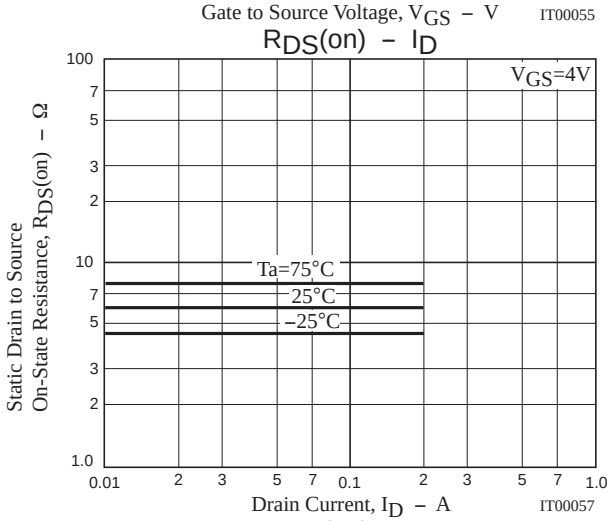
Switching Time Test Circuit

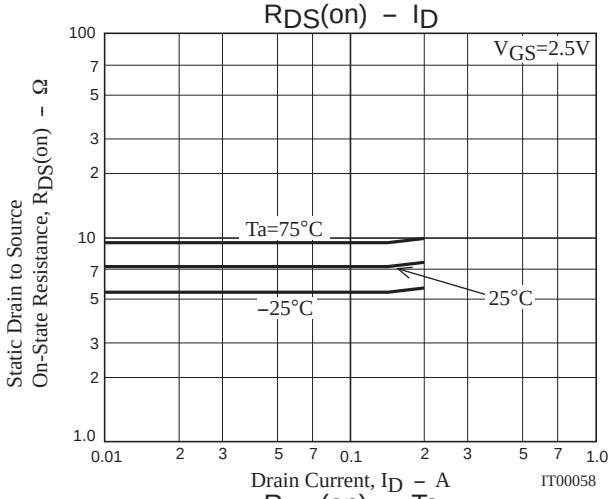


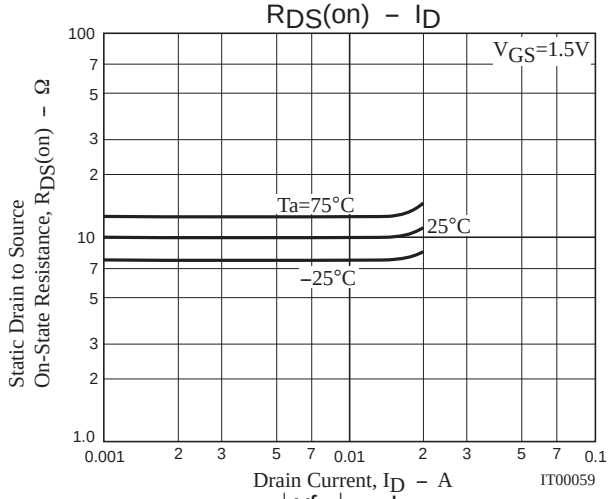

ID – VDS
3.5V
4.0V
3.0V
2.5V
2.0V
6.0V
VGS=1.5V
Drain Current, ID – A
Drain to Source Voltage, VDS – V
IT00054

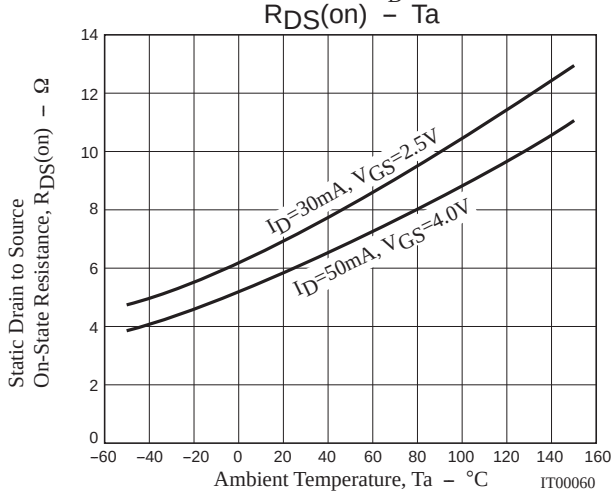

ID – VGS
VDS=10V
Ta=–25°C
25°C
75°C
Drain Current, ID – A
Gate to Source Voltage, VGS – V
IT00055

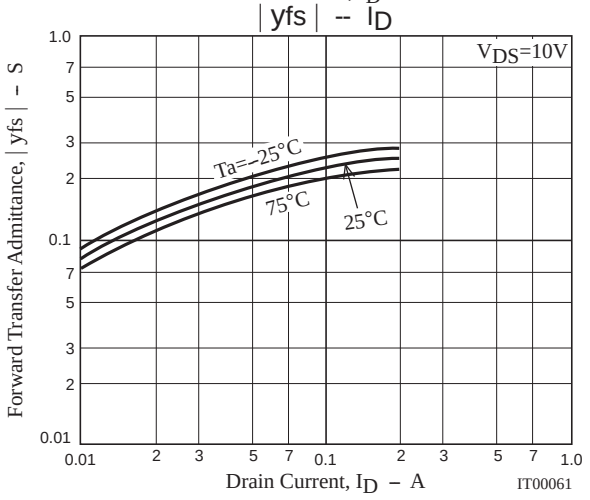

RDS(on) – VGS
Ta=25°C
50mA
ID=30mA
Static Drain to Source On-State Resistance, RDS(on) – Ω
Gate to Source Voltage, VGS – V
IT00056

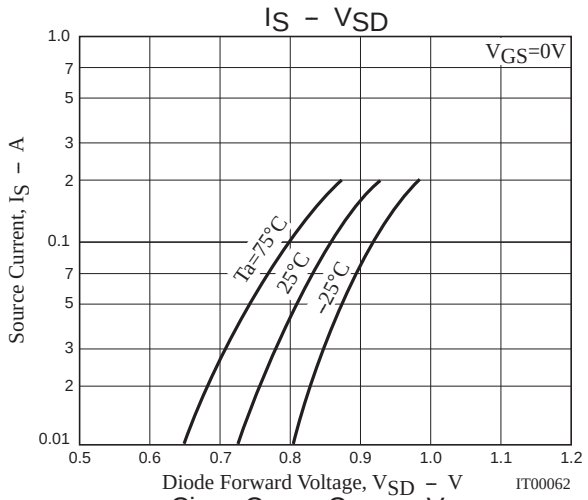

RDS(on) – ID
VGS=4V
Ta=75°C
25°C
–25°C
Static Drain to Source On-State Resistance, RDS(on) – Ω
Drain Current, ID – A
IT00057

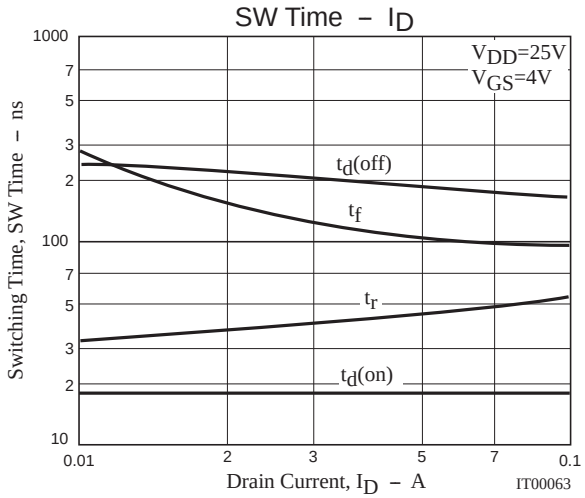

RDS(on) – ID
VGS=2.5V
Ta=75°C
25°C
–25°C
Static Drain to Source On-State Resistance, RDS(on) – Ω
Drain Current, ID – A
IT00058

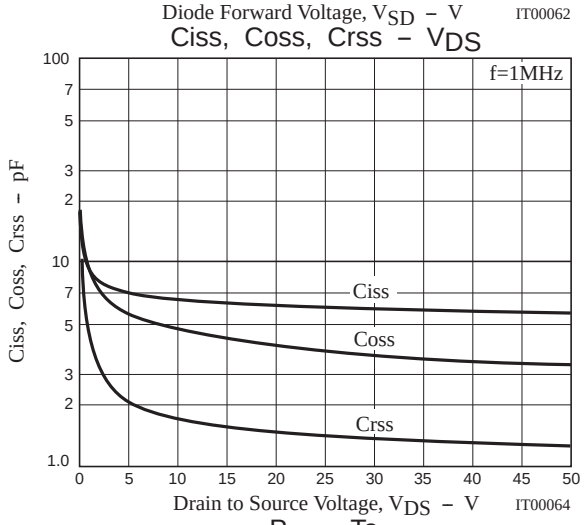

RDS(on) – ID
VGS=1.5V
Ta=75°C
25°C
–25°C
Static Drain to Source On-State Resistance, RDS(on) – Ω
Drain Current, ID – A
IT00059

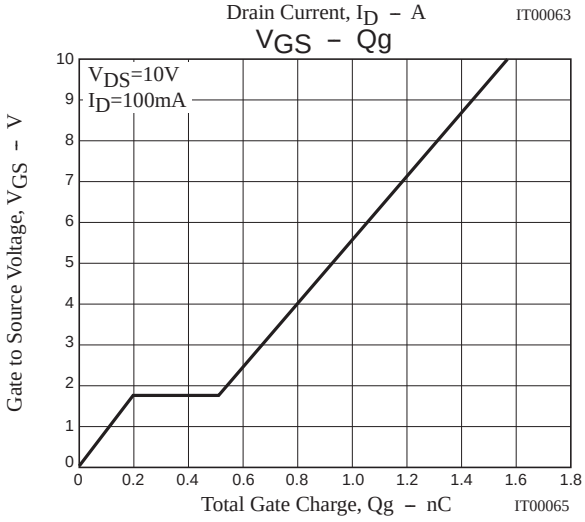

RDS(on) – Ta
ID=30mA, VGS=2.5V
ID=50mA, VGS=4.0V
Static Drain to Source On-State Resistance, RDS(on) – Ω
Ambient Temperature, Ta – °C
IT00060

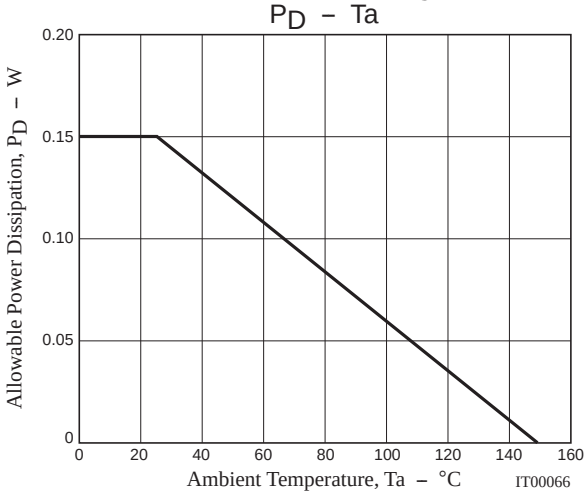

| yfs | – ID
VDS=10V
Ta=–25°C
75°C
25°C
Forward Transfer Admittance, | yfs | – S
Drain Current, ID – A
IT00061


IS – VSD
VGS=0V
Ta=75°C
25°C
–25°C
Source Current, IS – A
Diode Forward Voltage, VSD – V
IT00062


SW Time – ID
VDD=25V
VGS=4V
td(off)
tf
tr
td(on)
Switching Time, SW Time – ns
Drain Current, ID – A
IT00063

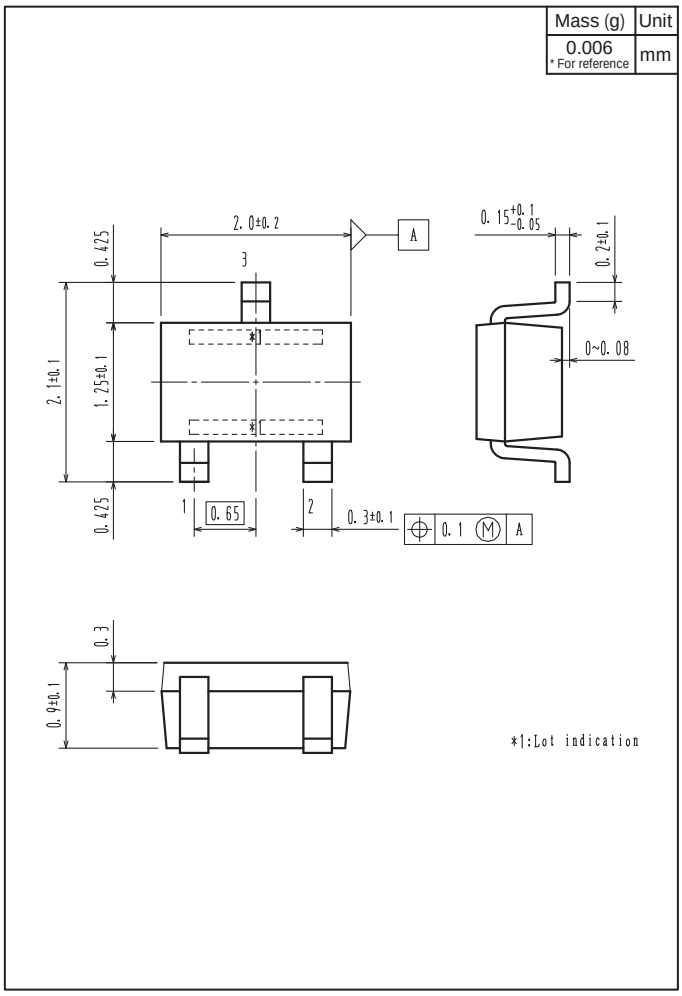

Ciss, Coss, Crss – VDS
f=1MHz
Ciss
Coss
Crss
Ciss, Coss, Crss – pF
Drain to Source Voltage, VDS – V
IT00064


VGS – Qg
VDS=10V
ID=100mA
Gate to Source Voltage, VGS – V
Total Gate Charge, Qg – nC
IT00065

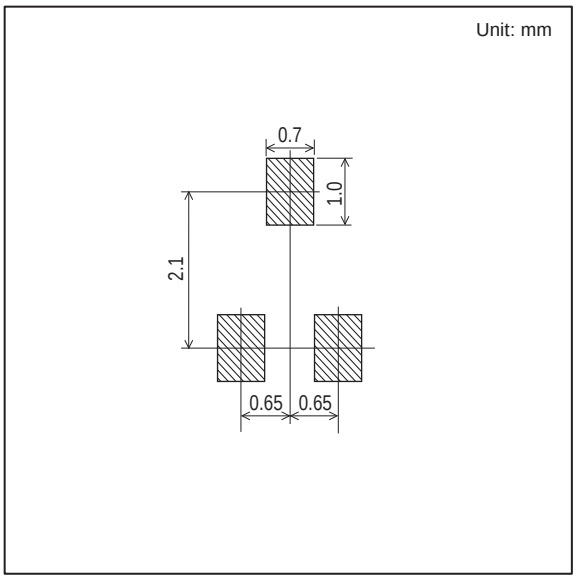

PD – Ta
Allowable Power Dissipation, PD – W
Ambient Temperature, Ta – °C
IT00066

Outline Drawing

5LN01M-TL-E, 5LN01M-TL-H



Land Pattern Example



Note on usage : Since the 5LN01M is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.