

### Description

The LMTL2N02 uses advanced trench technology to provide excellent  $R_{DS(ON)}$ , low gate charge and operation with gate voltages as low as 2.5V. This device is suitable for use as a Battery protection or in other Switching application.

### Dimensions SOT-23



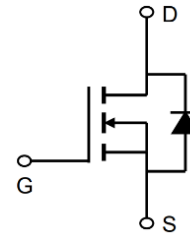
### General Features

$V_{DS} = 20V$   $I_D = 2.3A$   
 $R_{DS(ON)} < 56m\Omega @ V_{GS}=4.5V$

### Application

- Battery protection
- Load switch
- Uninterruptible power supply

### Pin Configuration



### Package Marking and Ordering Information

Device	Device Marking	Device Package	Reel Size	Tape width	Quantity
LMTL2N02	A2SHB	SOT-23	Ø180mm	8 mm	3000 units

### Absolute Maximum Ratings (TC=25°C unless otherwise noted)

Symbol	Parameter	Limit	Unit
$V_{DS}$	Drain-source Voltage	20	V
$V_{GS}$	Gate-source Voltage	±12	V
$I_{D@ TA=25^{\circ}C}$	Continuous Drain Current $V_{GS} @ 4.5V$	2.3	A
$I_{D@ TA=70^{\circ}C}$	Continuous Drain Current $V_{GS} @ 4.5V$	1.8	A
IDM	Pulsed Drain Current <sup>A</sup>	14	A
$P_D$	Total Power Dissipation @ $T_A=25^{\circ}C$	0.7	W
$R_{\theta JA}$	Thermal Resistance Junction-to-Ambient@Steady State	178	°C/W
$T_J, T_{STG}$	Junction and Storage Temperature Range	-55~+150	°C

## Electrical Characteristics (T<sub>J</sub>=25°C, unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
BV <sub>DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> = 0V, I <sub>D</sub> =250μA	20	21		V
IDSS	Zero Gate Voltage Drain Current	V <sub>DS</sub> =20V, V <sub>GS</sub> =0V, T <sub>C</sub> =25°C			1	μA
IGSS	Gate-Body Leakage Current	V <sub>GS</sub> = ±12V, V <sub>DS</sub> =0V			±100	nA
VGS(th)	Gate Threshold Voltage	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> =250μA	0.52	0.66	0.9	V
RDS(ON)	Static Drain-Source On-Resistance	V <sub>GS</sub> = 4.5V, I <sub>D</sub> =2.0A		43	56	mΩ
		V <sub>GS</sub> = 2.5V, I <sub>D</sub> =1.5A		58	78	
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> =10V, V <sub>GS</sub> =0V, f=1MHZ		280		pF
C <sub>oss</sub>	Output Capacitance			46		
C <sub>rss</sub>	Reverse Transfer Capacitance			29		
Q <sub>g</sub>	Total Gate Charge	V <sub>GS</sub> =4.5V, V <sub>DS</sub> =10V, I <sub>D</sub> =3.0A		2.9		nC
Q <sub>gs</sub>	Gate Source Charge			0.4		
Q <sub>gd</sub>	Gate Drain Charge			0.6		
tD(on)	Turn-on Delay Time	V <sub>GS</sub> =4.5V, V <sub>DD</sub> =10V, R <sub>L</sub> =1.5Ω, R <sub>GEN</sub> =3Ω		13		ns
t <sub>r</sub>	Turn-on Rise Time			54		
tD(off)	Turn-off Delay Time			18		
t <sub>f</sub>	Turn-off Fall Time			11		
I <sub>S</sub>	Maximum Body-Diode Continuous Current				3.0	A
V <sub>SD</sub>	Diode Forward Voltage	I <sub>S</sub> =3.0A, V <sub>GS</sub> =0V			1.2	V

**Note:**

- 1、 Pulse Test: Pulse Width ≤ 300us, Duty cycle ≤ 2%.
- 2、 Device mounted on FR-4 PCB, 1 inch x 0.85 inch x 0.062 inch.

### Typical Characteristics

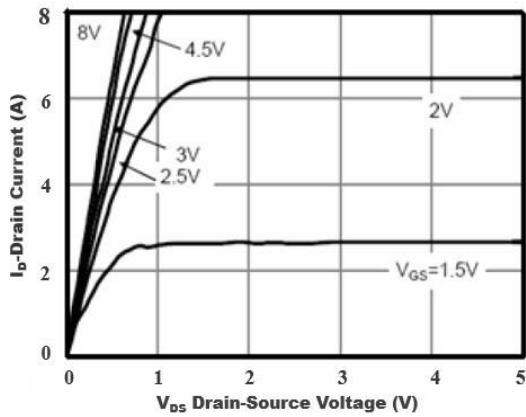


Figure1. Output Characteristics

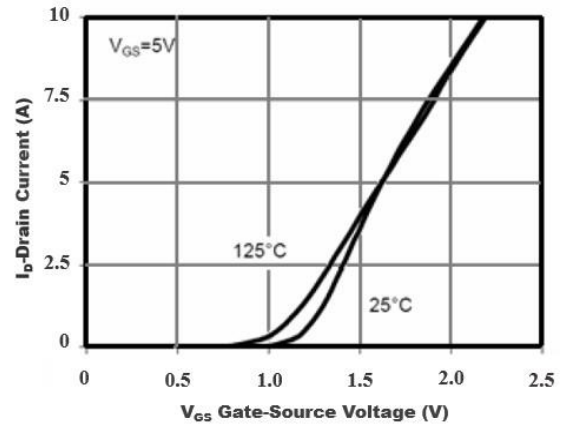


Figure2. Transfer Characteristics

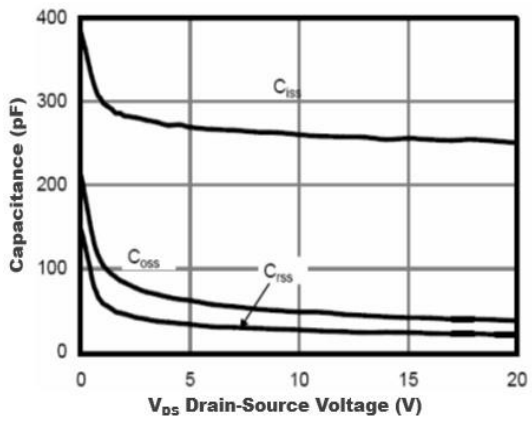


Figure3. Capacitance Characteristics

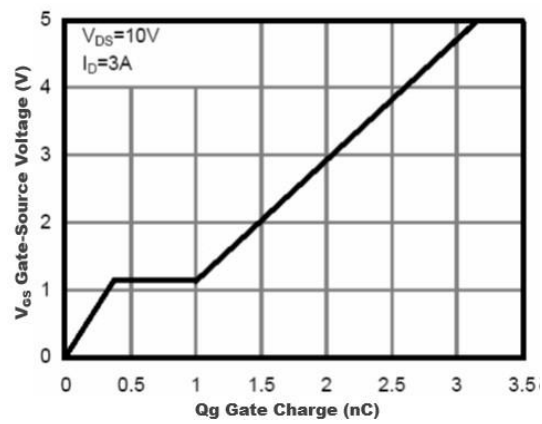


Figure4. Gate Charge

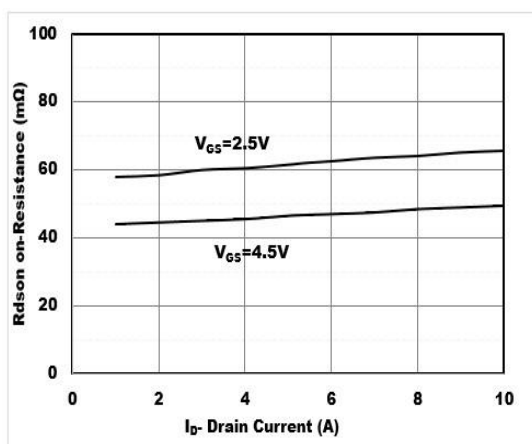


Figure5. Drain-Source on Resistance

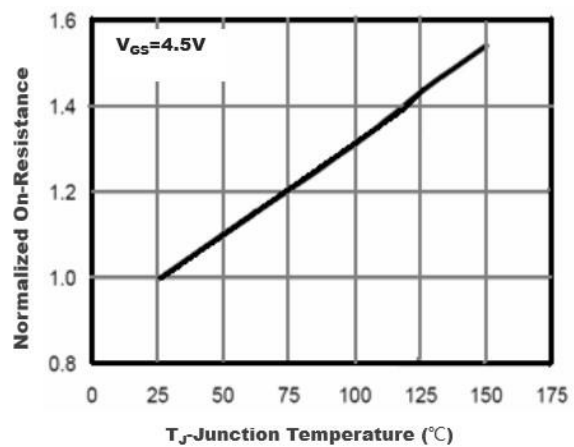


Figure6. Drain-Source on Resistance

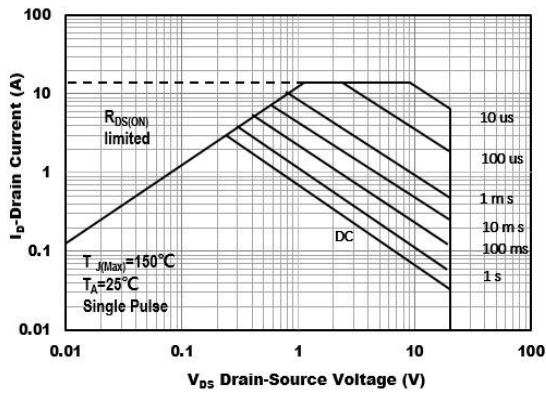


Figure7. Safe Operation Area

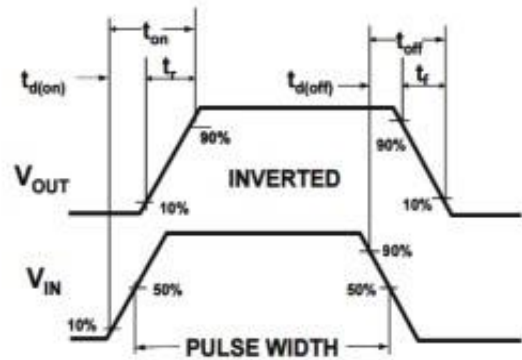
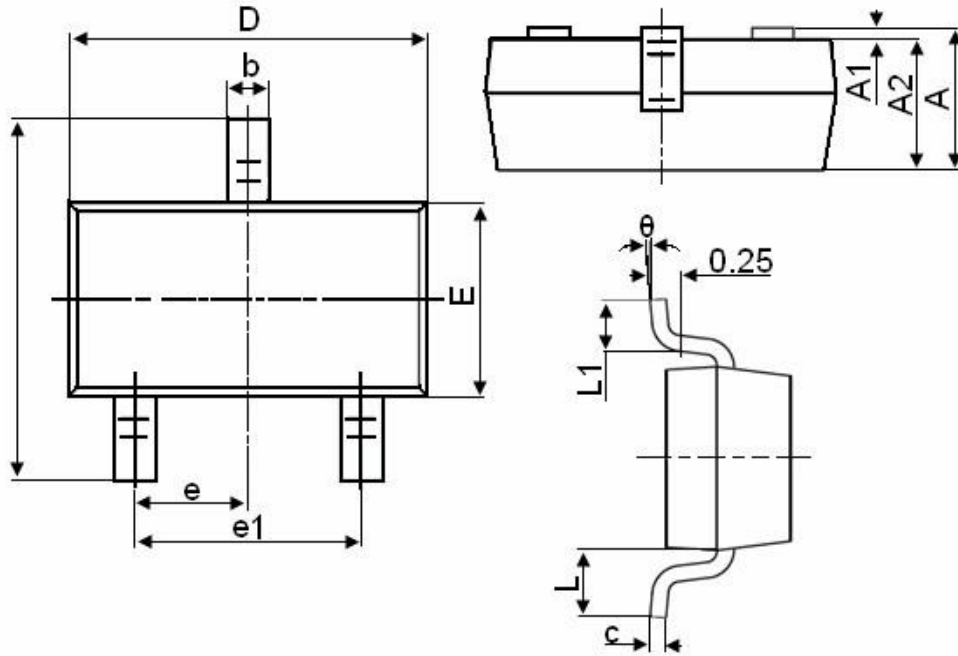


Figure8. Switching wave

Package Mechanical Data:SOT-23



Symbol	Dimensions in Millimeters	
	MIN.	MAX.
A	0.900	1.150
A1	0.000	0.100
A2	0.900	1.050
b	0.300	0.500
c	0.080	0.150
D	2.800	3.000
E	1.200	1.400
E1	2.250	2.550
e	0.950TYP	
e1	1.800	2.000
L	0.550REF	
L1	0.300	0.500
$\theta$	0°	8°

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