

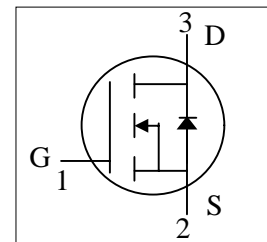
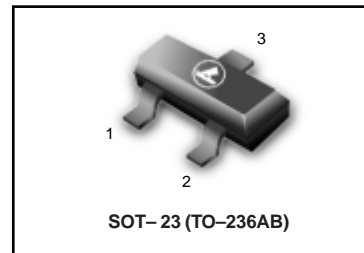
## 20V N-Channel Enhancement-Mode MOSFET

$V_{DS} = 20V$

$R_{DS(ON)}, V_{GS}@2.5V, I_{DS}@5.2A = 50m\Omega$

$R_{DS(ON)}, V_{GS}@4.5V, I_{DS}@6A = 40m\Omega$

LN2502LT1G



### Features

Advanced trench process technology  
High Density Cell Design For Ultra Low On-Resistance

### Ordering Information

Device	Marking	Shipping
LN2502LT1G	N25	3000/Tape&Reel
LN2502LT3G	N25	10000/Tape&Reel

### Maximum Ratings and Thermal Characteristics (T<sub>A</sub> = 25°C unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	$V_{DS}$	20	V
Gate-Source Voltage	$V_{GS}$	± 12	
Continuous Drain Current	$I_D$	6	A
Pulsed Drain Current <sup>1)</sup>	$I_{DM}$	33	
Operating Junction and Storage Temperature Range	$T_J, T_{stg}$	-55 to 150	°C

Note: 1. Repetitive Rating: Pulse width limited by the maximum junction temperature

## LN2502LT1G

**Electrical Characteristics**

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
<b>Static</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS} = 0V, I_D = 250\mu A$	20			V
Drain-Source On-State Resistance	$R_{DS(on)}$	$V_{GS} = 2.5V, I_D = 5.2A$		42.0	50.0	mΩ
Drain-Source On-State Resistance	$R_{DS(on)}$	$V_{GS} = 4.5V, I_D = 6A$		33.0	40.0	
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	0.4		0.9	V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = 20V, V_{GS} = 0V$			1	μA
Gate Body Leakage	$I_{GSS}$	$V_{GS} = \pm 12V, V_{DS} = 0V$			±100	nA
Forward Transconductance	$g_{fs}$	$V_{DS} = 10V, I_D = 6A$		5		S
<b>Dynamic<sup>3)</sup></b>						
Total Gate Charge	$Q_g$	$V_{DS} = 10V, I_D = 6A$ $V_{GS} = 4.5V$		5	7	nC
Gate-Source Charge	$Q_{gs}$			1		
Gate-Drain Charge	$Q_{gd}$			1.5		
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = 10V, R_G = 6\Omega$ $I_D = 1A, V_{GS} = 4.5V$		8	20	ns
Turn-On Rise Time	$t_r$			10	20	
Turn-Off Delay Time	$t_{d(off)}$			22	45	
Turn-Off Fall Time	$t_f$			6	15	
Input Capacitance	$C_{iss}$	$V_{DS} = 8V, V_{GS} = 0V$ $f = 1.0\text{ MHz}$		565		pF
Output Capacitance	$C_{oss}$			105		
Reverse Transfer Capacitance	$C_{rss}$			75		
<b>Source-Drain Diode</b>						
Max. Diode Forward Current	$I_S$				1.7	A
Diode Forward Voltage	$V_{SD}$	$I_S = 1.7A, V_{GS} = 0V$			1.2	V

Note: Pulse test: pulse width ≤ 300μs, duty cycle ≤ 2%

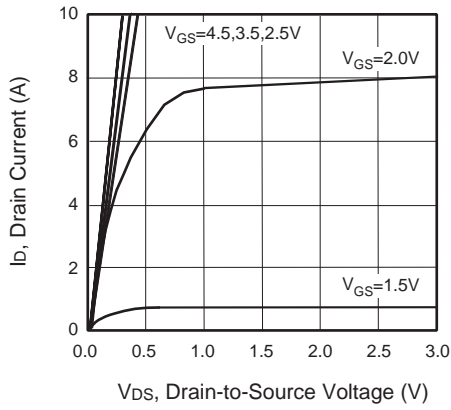


Figure 1. Output Characteristics

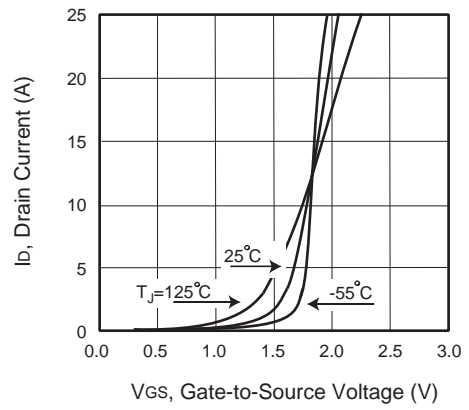


Figure 2. Transfer Characteristics

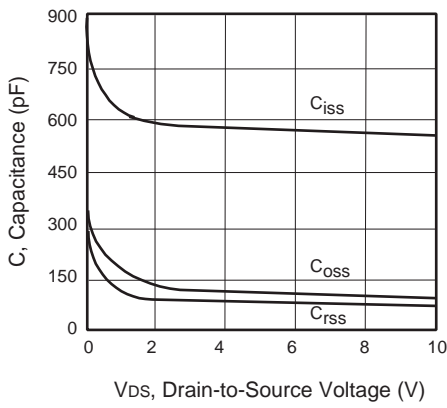


Figure 3. Capacitance

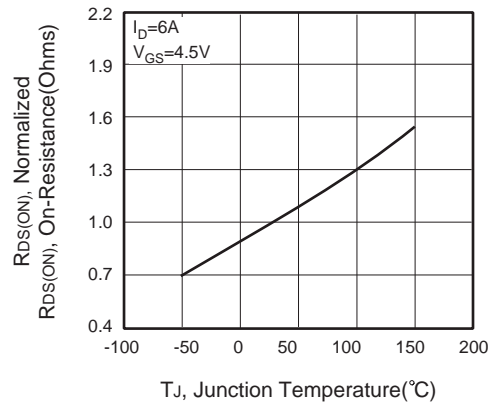


Figure 4. On-Resistance Variation with Temperature

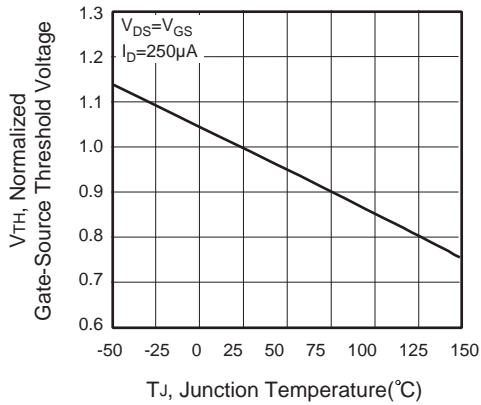


Figure 5. Gate Threshold Variation with Temperature

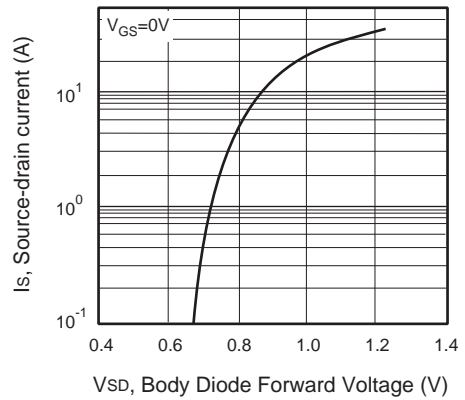


Figure 6. Body Diode Forward Voltage Variation with Source Current

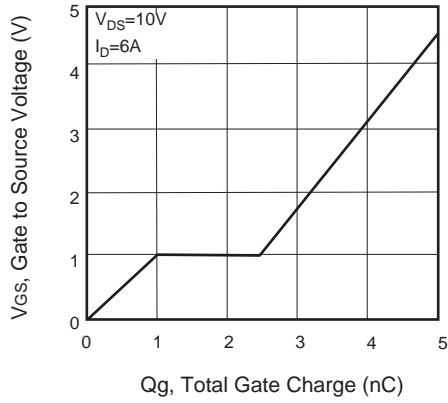


Figure 7. Gate Charge

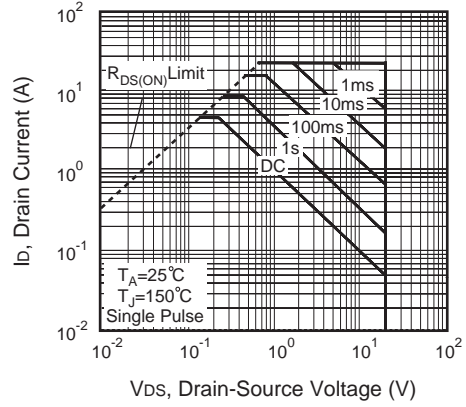


Figure 8. Maximum Safe Operating Area

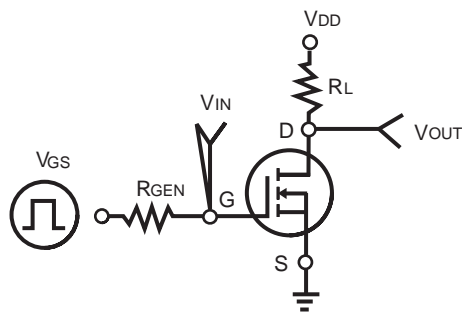


Figure 9. Switching Test Circuit

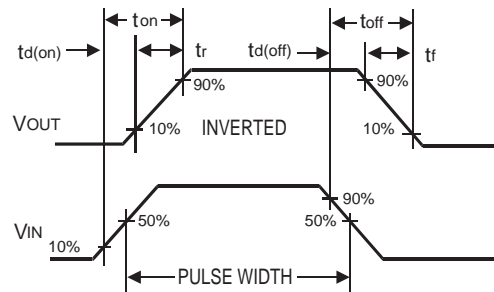


Figure 10. Switching Waveforms

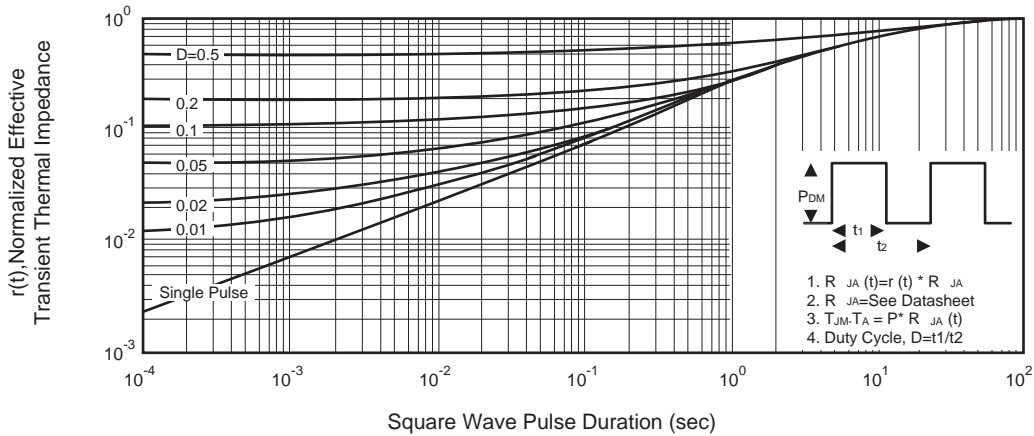


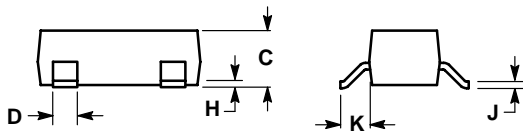
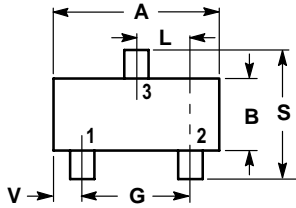
Figure 11. Normalized Thermal Transient Impedance Curve

LN2502LT1G

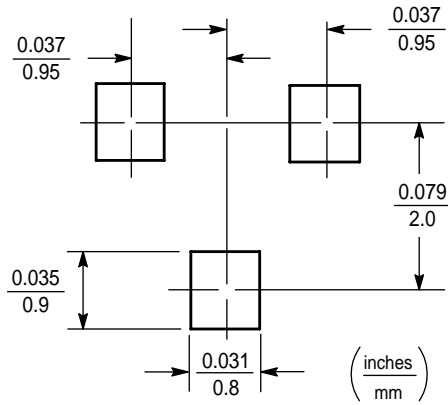
SOT-23

NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M,1982
2. CONTROLLING DIMENSION: INCH.



DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.1102	0.1197	2.80	3.04
B	0.0472	0.0551	1.20	1.40
C	0.0350	0.0440	0.89	1.11
D	0.0150	0.0200	0.37	0.50
G	0.0701	0.0807	1.78	2.04
H	0.0005	0.0040	0.013	0.100
J	0.0034	0.0070	0.085	0.177
K	0.0140	0.0285	0.35	0.69
L	0.0350	0.0401	0.89	1.02
S	0.0830	0.1039	2.10	2.64
V	0.0177	0.0236	0.45	0.60



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