

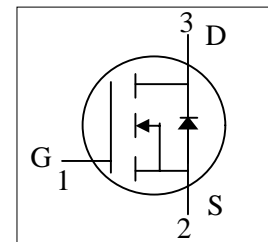
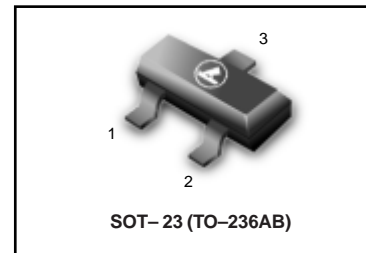
20V N-Channel Enhancement-Mode MOSFET

$V_{DS} = 20V$

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

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

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_A = 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 ¹⁾	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
Static						
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	m Ω
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
Dynamic³⁾						
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		
Source-Drain Diode						
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 $\leq 300\mu s$, duty cycle $\leq 2\%$

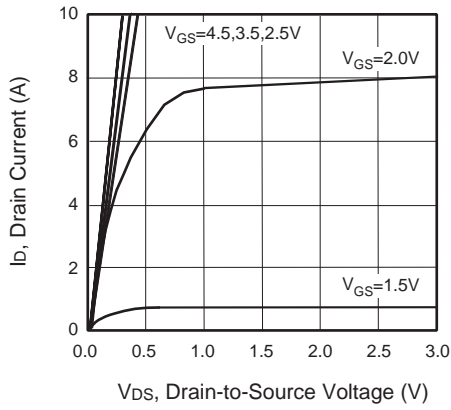


Figure 1. Output Characteristics

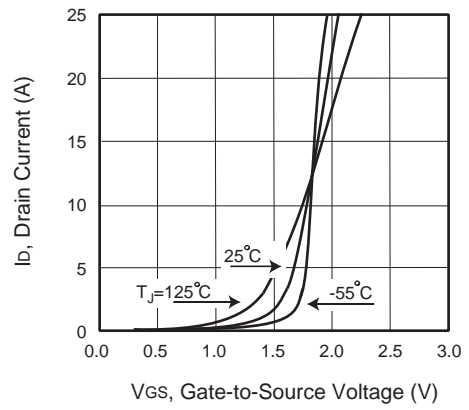


Figure 2. Transfer Characteristics

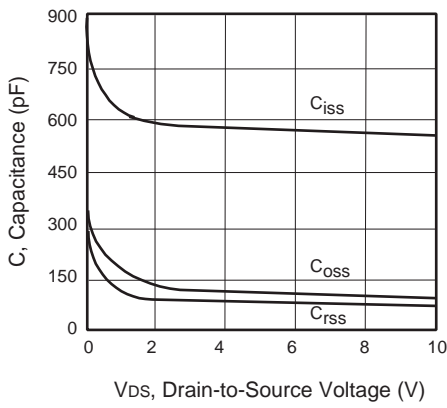


Figure 3. Capacitance

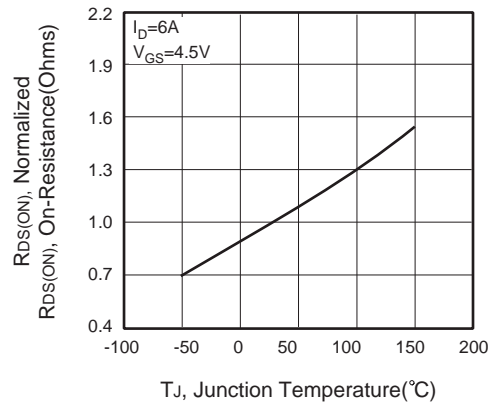


Figure 4. On-Resistance Variation with Temperature

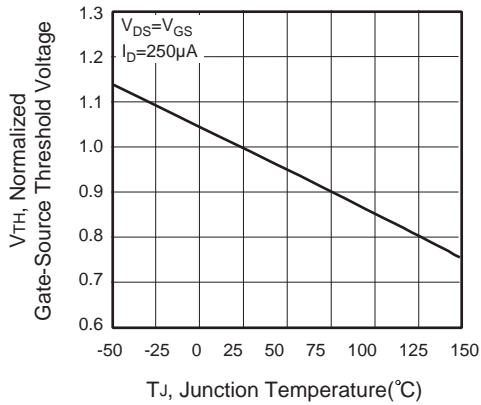


Figure 5. Gate Threshold Variation with Temperature

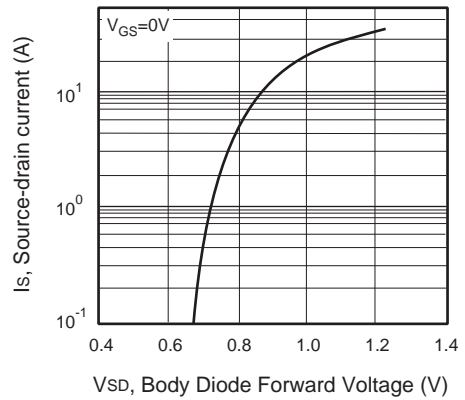


Figure 6. Body Diode Forward Voltage Variation with Source Current

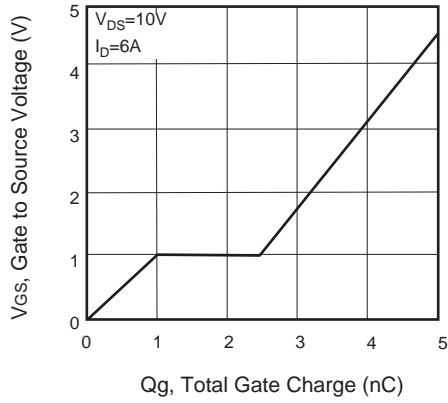


Figure 7. Gate Charge

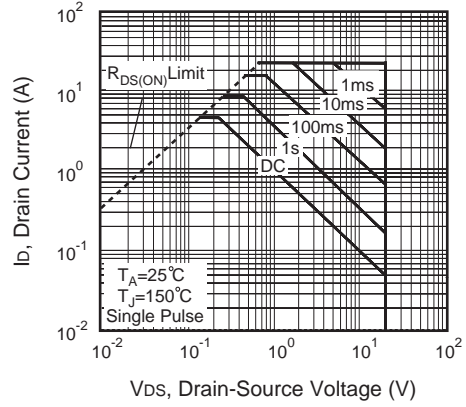


Figure 8. Maximum Safe Operating Area

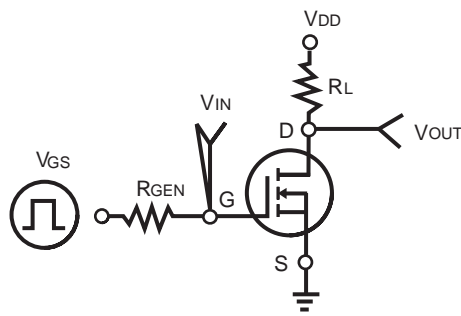


Figure 9. Switching Test Circuit

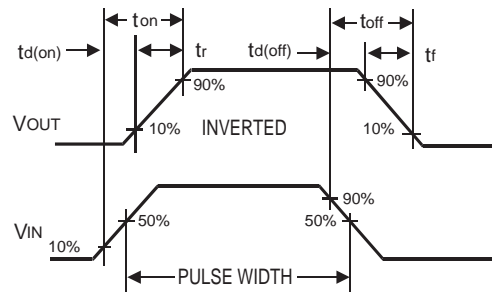


Figure 10. Switching Waveforms

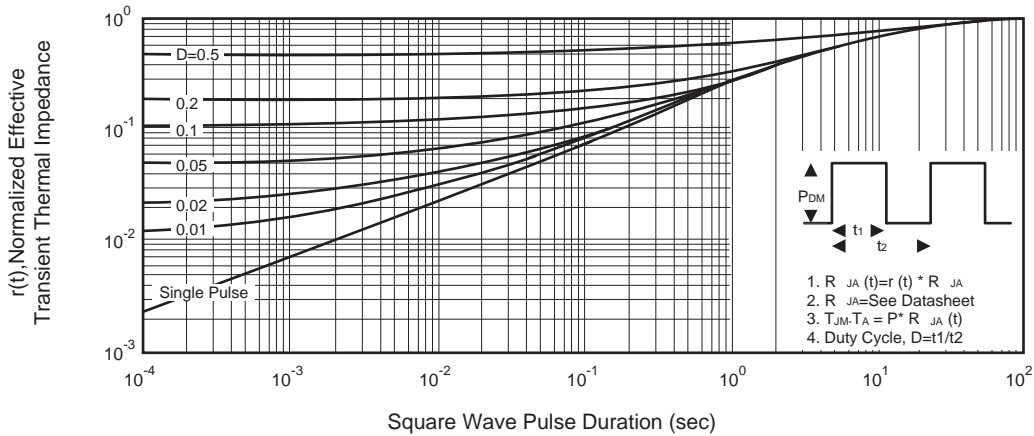
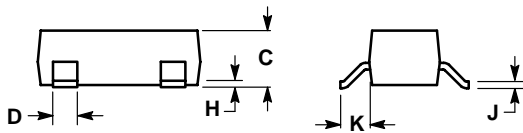
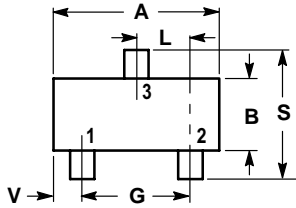


Figure 11. Normalized Thermal Transient Impedance Curve

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

