LEADING TECHNOLOGY
Semiconductor

LTD45N06

60V N-CHANNEL TRENCH FET

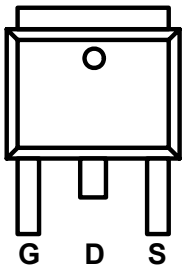
FEATURES

- V_{DSS}=60V
- I_{DS} =45A @ V_{GS}=10V
- $R_{DS(ON)}$<12mΩ @ V_{GS}=10V I_D=20A
- $Q_{g\_typ.}$=66nC @ V_{GS}=10V

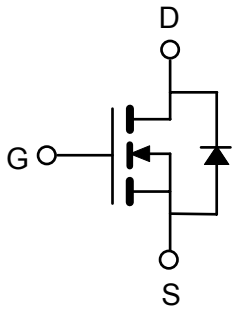
APPICATION

- Power Supply
- Industrial
- Primary Switch

TO-252 D-PAK
Top View



Drain Connected to Tab



ABSOLUTE MAXIMUM RATING

(T_A = 25 °C UNLESS OTHERWISE NOTED)				
Parameter		**Symbol**	**Rating**	**Units**
Drain-Source Voltage		V_{DS}	60	V
Gate-Source Voltage		V_{GS}	±20	V
Drain Current[A]	T_C=25°C	I_D	45	A
	T_C=100°C		28	
Pulsed Drain Current[C]	Pulse	I_{DM}	83	
Single Pulse Avalanche Current[B]	T_{start}=25 °C	I_{AS}	41	A
Power Dissipation[A]	T_C=25°C	P_D	42	W
	T_C=100°C		17	
Junction and Storage Temperature Range		T_J, T_{stg}	-55 to 150	°C
Single Avalanche Energy[B]	L=0.3mH	E_{AS}	250	mJ

THERMAL RESISTANCE RATINGS			
Parameter	**Symbol**	**Maximum**	**Units**
Maximum Junction-to-Ambient[D]	$R_{\theta JA}$	60	°C/W
Maximum Junction-to-Case[D]	$R_{\theta JC}$	3	°C/W

TRENCH FET ELECTRICAL CHARACTERISTICS

SPECIFICATIONS (T_A = 25°C UNLESS OTHERWISE NOTED)						
Parameter	**Symbol**	**Test Conditions**	**Limits**			**Unit**
			Min	**Typ**	**Max**	
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0 V, I_D = 250uA	60			V
Gate-Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250uA	1.5		3.5	
Gate-Body Leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ±20V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} =48V, V_{GS} = 0 V			100	nA
		125 °C			10	uA
Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS} = 10 V, I_D = 20A		10	12	mΩ
		V_{GS} = 4.5 V, I_D =10 A		12	14	
		V_{GS}=10V, I_D=20A, T_J=125°C			21	
Dynamic Characteristics						
Input Capacitance	C_{ISS}	V_{DS}=25V, V_{GS}=0V, f=1.0Mhz		3696		pF
Output Capacitance	C_{OSS}			258		
Reverse Transfer Capacitance	C_{RSS}			104		
Total Gate Charge	Q_g	V_{DS} = 30 V, I_D = 40 A, V_{GS}=10V		66		nC
Gate-Source Charge	Q_{gs}			16.2		
Gate-Drain Charge	Q_{gd}			13.8		
Switching Characteristics[E]						
Turn-On Delay Time	$t_{d(on)}$	V_{GS}=10V, V_{DD}=48V, I_D=10A, R_g=3Ohm		15		nS
Rise Time	t_r			14		
Turn-Off Delay Time	$t_{d(off)}$			53		
Fall-Time	t_f			15		
Gate Resistance	R_g	f=1MHz		2.8		Ω
Body Diode Characteristics						
Diode Forward Voltage	V_{SD}	V_{GS}=0V, I_F=20A		0.85	1	V
Reverse Recovery Time[E]	t_{rr}	V_{GS}=0V, I_F=10A, dI_F/dt=300A/us		29		ns
Diode Reverse Charge[E]	Q_{rr}			80		nC

Notes:

A, Drain current and Power dissipation are based on maximum junction temperature $T_{j\,(max)}$=150° C.

B, Single pulse UIS energy, inductor=0.3mH, V_{GS}=10V , T_{start}=25° C.

C, Pulse width limited by junction temperature $T_{j\,(mxa)}$=150° C, the pulse current value was based on T_A=25° C, repetitive rating based on duty cycles to keep initial T_j=25° C.

D, The value of $R_{\theta JA}$ and $R_{\theta JC}$ were measured with device mounted on tested board based on JESD51-7 requirement, and in still air environment with T_A=25° C in according to JESD51-2.

E, Pulse test: PW ≤ 300us duty cycle ≤ 2%.

Typical Electrical Characteristics (N-Channel)

T_A = +25°C, unless otherwise noted

Figure 1. On-Regions Characteristics

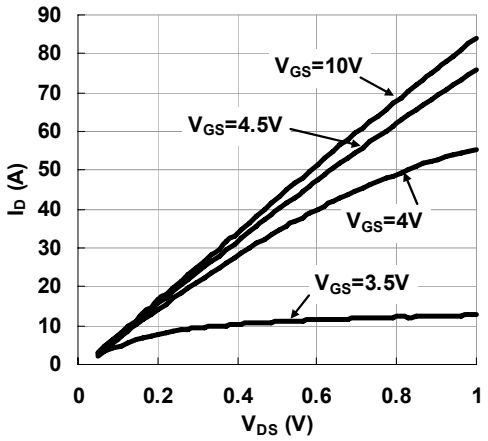


Figure 2. On-Resistance versus Drain Current

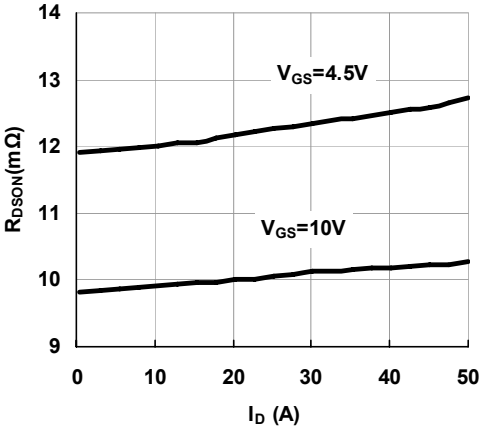


Figure3. On-Resistance Normalized versus Temperature

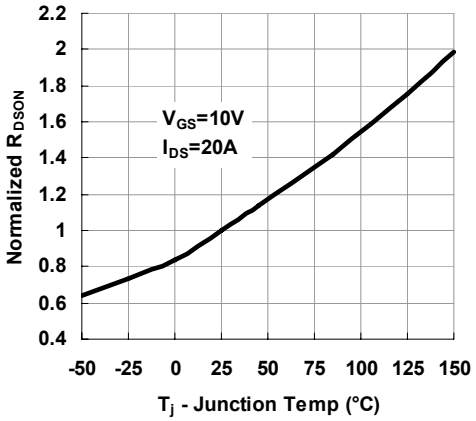


Figure 4. On-Resistance versus Gate to Source Voltage

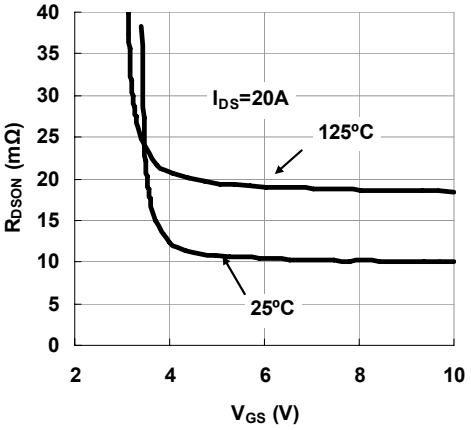


Figure 5. Transfer Characteristics

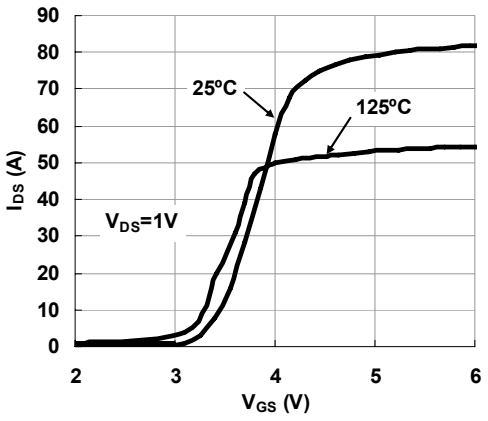
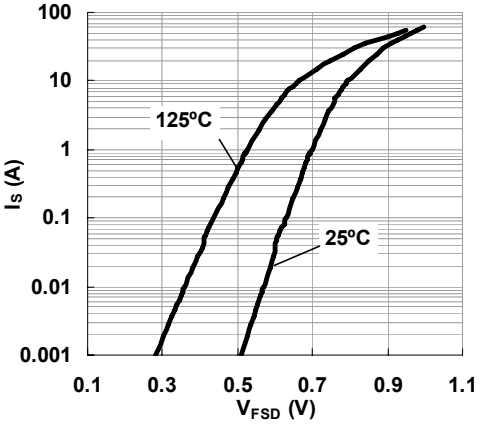


Figure 6. Body Diode Forward Voltage versus Source Current



Typical Electrical Characteristics (N-Channel)

T_A = +25°C, unless otherwise noted

Figure 7. Threshold versus Temperature

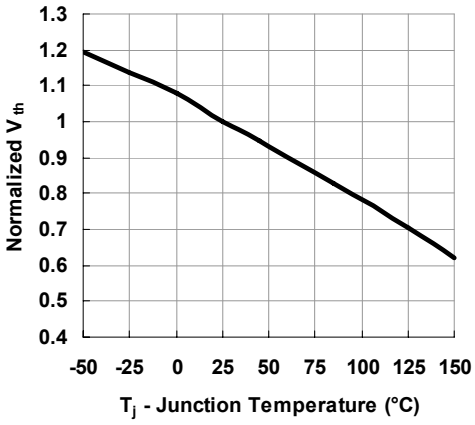


Figure 8. Body Diode Forward Voltage versus Temperature

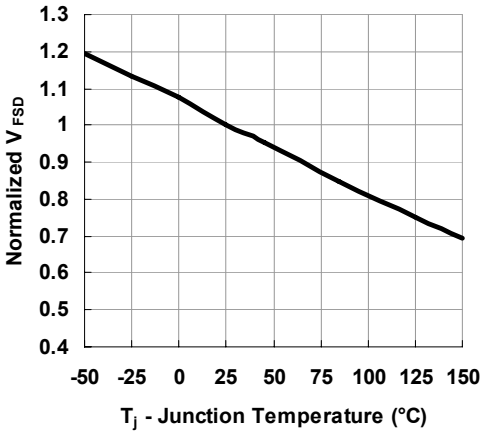


Figure 9. Gate Charge Characteristics

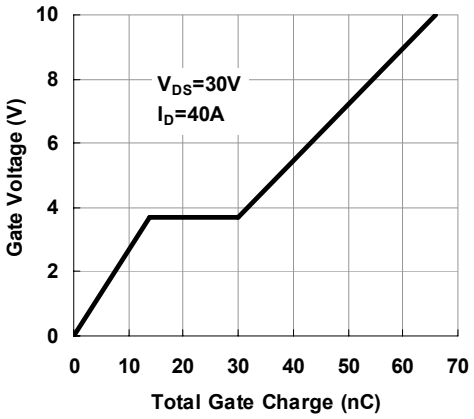
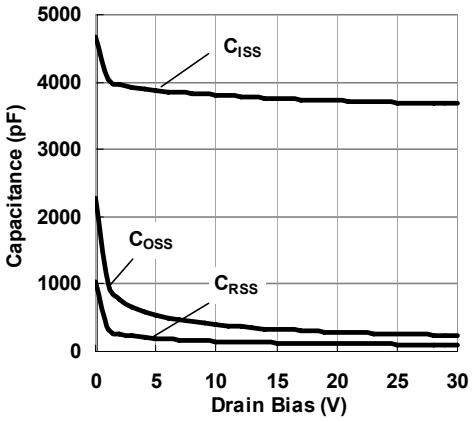
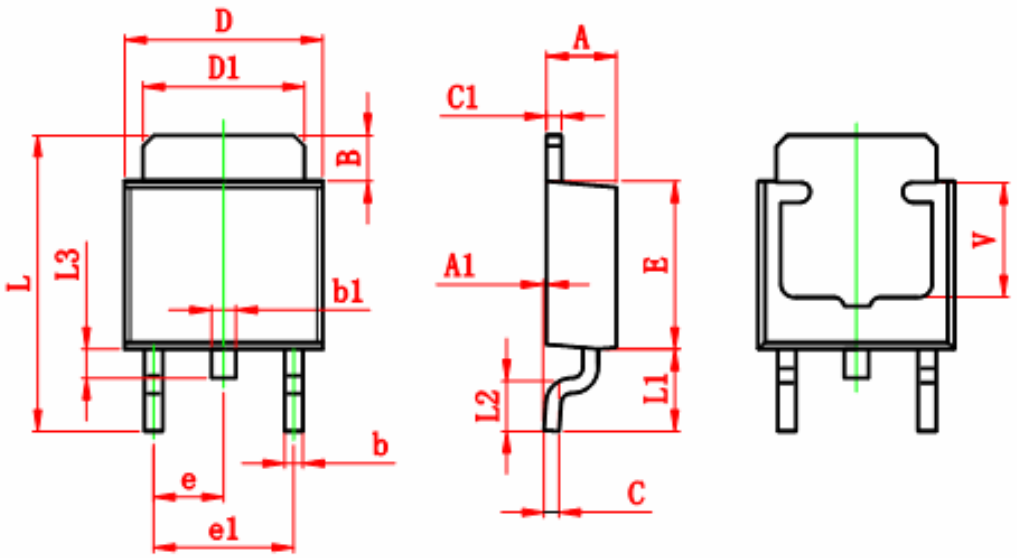


Figure 10. Capacitance Characteristics



TO-220 Package Outline Drawing



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.200	2.400	0.087	0.094
A1	0.000	0.127	0.000	0.005
B	1.350	1.650	0.053	0.065
b	0.500	0.700	0.020	0.028
b1	0.700	0.900	0.028	0.035
c	0.430	0.580	0.017	0.023
c1	0.430	0.580	0.017	0.023
D	6.350	6.650	0.250	0.262
D1	5.200	5.400	0.205	0.213
E	5.400	5.700	0.213	0.224
e	2.300 TYP.		0.091 TYP.	
e1	4.500	4.700	0.177	0.185
L	9.500	9.900	0.374	0.390
L1	2.550	2.900	0.100	0.114
L2	1.400	1.780	0.055	0.070
L3	0.600	0.900	0.024	0.035
V	3.800 REF.		0.150 REF.	