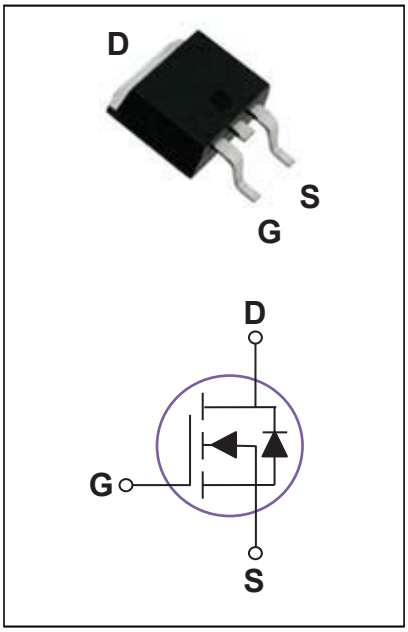
30V N-Channel MOSFETS LDD3964

TO-252 Pin Configuration

BVDSS	RDSON	ID
30V	4.1mΩ	74A



Features

- *30V,74A, RDS(ON) =4.1mΩ@VGS = 10V*
- *Improved dv/dt capability*
- *Fast switching*
- *100% EAS Guaranteed*
- *Green Device Available*

Applications

- *Networking*
- *Load Switch*
- *LED applications*

MAXIMUM RATINGS AND CHARACTERISTICS

@ 25°C Ambient Temperature (unless otherwise noted)

Parameter	Symbol	Rating	Units
Drain-Source Voltage	VDS	30	V
Gate-Source Voltage	VGS	±20	V
Drain Current – Continuous (TC=25˚C)	ID	74	A
Drain Current – Continuous (TC=100˚C)		46.8	A
Drain Current – Pulsed[1]	IDM	296	A
Single Pulse Avalanche Energy[2]	EAS	115	mJ
Single Pulse Avalanche Current[2]	IAS	48	A
Power Dissipation (TC=25˚C)	PD	54.3	W
Power Dissipation – Derate above 25˚C		0.44	W/˚C
Storage Temperature Range	TSTG	-50 to +150	˚C
Operating Junction Temperature Range	TJ	-50 to +150	˚C

Thermal Characteristics

Parameter	Symbol	Typ.	Max.	Unit
Thermal Resistance Junction to ambient	RθJA	---	62	˚C/W
Thermal Resistance Junction to Case	RθJC	---	2.3	˚C/W

MOSFET ELECTRICAL CHARACTERISTICS T_A=25℃ unless otherwise specified

Off Characteristics

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V , I_D=250uA	30	---	---	V
BV_{DSS} Temperature Coefficient	$\triangle BV_{DSS}/\triangle T_J$	Reference to 25℃ , ID=1mA	---	0.03	---	V/℃
Drain-Source Leakage Current	I_{DSS}	VDS=30V , VGS=0V , TJ=25℃	---	---	1	uA
		VDS=24V , VGS=0V , TJ=125℃	---	---	10	uA
Gate-Source Leakage Current	I_{GSS}	V_{GS}=±20V , V_{DS}=0V	---	---	±100	nA

On Characteristics

Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=10V , I_D=15A	---	3.4	4.1	mΩ
		V_{GS}=4.5V , I_D=10A	---	4.7	6	mΩ
Gate Threshold Voltage	$V_{GS(th)}$	V_{GS}=V_{DS} , I_D =250uA	1.0	1.6	2.5	V
$V_{GS(th)}$ Temperature Coefficient	$\triangle V_{GS(th)}$		---	-4.17	---	mV/℃
Forward Transconductance	gfs	V_{DS}=10V , I_D=3A	---	10	---	S

Dynamic and switching Characteristics

Total Gate Charge[3,4]	Q_g	V_{DS}=15V , V_{GS}=10V , I_D=15A	---	34.6	70	nC
Gate-Source Charge[3,4]	Q_{gs}		---	5.5	11	
Gate-Drain Charge[3,4]	Q_{gd}		---	6.8	13	
Turn-On Delay Time[3,4]	$T_{d(on)}$	V_{DD}=15V , V_{GS}=10V , R_G=3.3Ω I_D=1A	---	9.7	20	ns
Rise Time[3,4]	T_r		---	15.8	31	
Turn-Off Delay Time[3,4]	$T_{d(off)}$		---	37.4	75	
Fall Time[3,4]	T_f		---	12	24	
Input Capacitance	C_{iss}	V_{DS}=15V , V_{GS}=0V , F=1MHz	---	1910	3800	pF
Output Capacitance	C_{oss}		---	300	600	
Reverse Transfer Capacitance	C_{rss}		---	230	460	
Gate resistance	R_g	V_{GS}=0V, V_{DS}=0V, F=1MHz	---	1.14	---	Ω

Drain-Source Diode Characteristics and Maximum Ratings

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Continuous Source Current	I_S	V_G=V_D=0V , Force Current	---	---	74	A
Pulsed Source Current	I_{SM}		---	---	148	A
Diode Forward Voltage	V_{SD}	V_{GS}=0V , I_S=1A , T_J=25℃	---	---	1	V
Reverse Recovery Time	t_{rr}	V_{DS}=30V,I_S=10A , di/dt=100A/μs T_J=25℃	---	2.33	---	us
Reverse Recovery Charge	Q_{rr}		---	48.9	---	uC

Note :
1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. V_{DD}=25V,V_{GS}=10V,L=0.1mH,I_{AS}=48A.,R_G=25Ω,Starting T_J=25℃.
3. The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%.
4. Essentially independent of operating temperature.

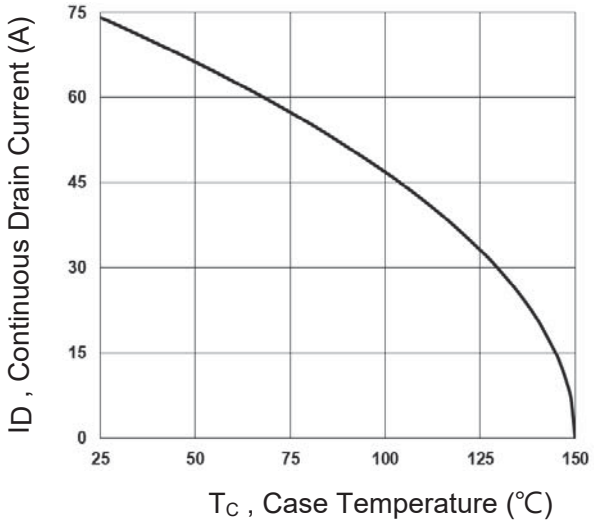


Fig.1 Continuous Drain Current vs. TC

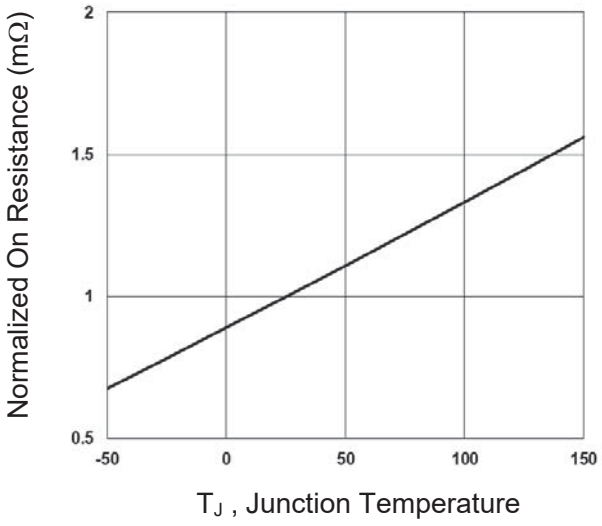


Fig.2 Normalized RDSON vs. TJ

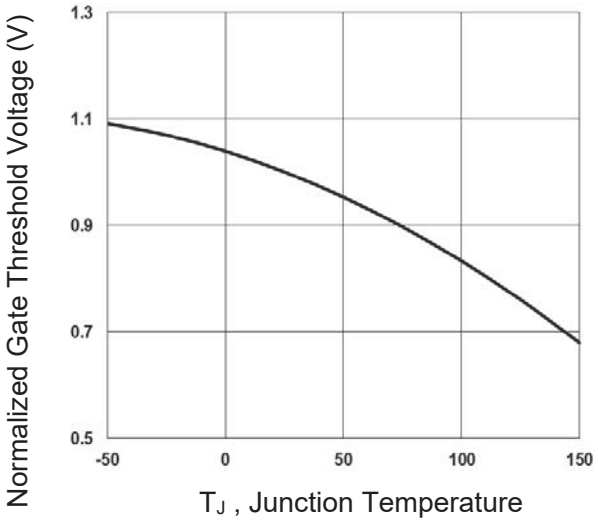


Fig.3 Normalized V_{th} vs. T_J

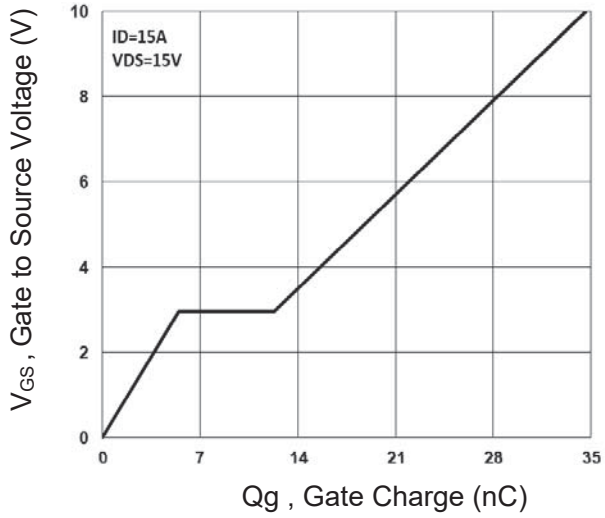


Fig.4 Gate Charge Characteristics

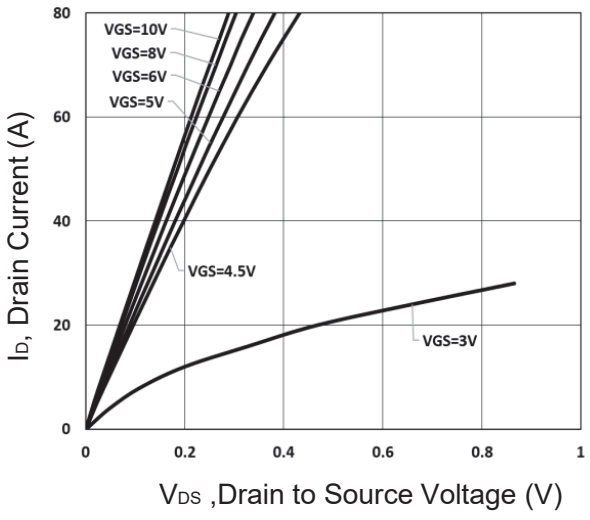


Fig.5 Typical Output Characteristics

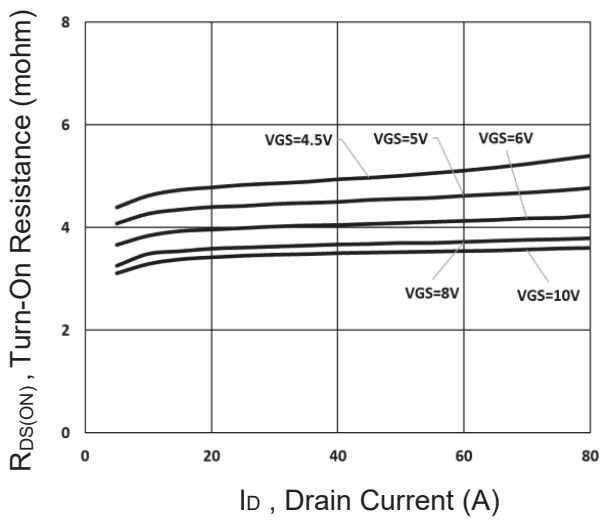


Fig.6 Turn-On Resistance vs. ID

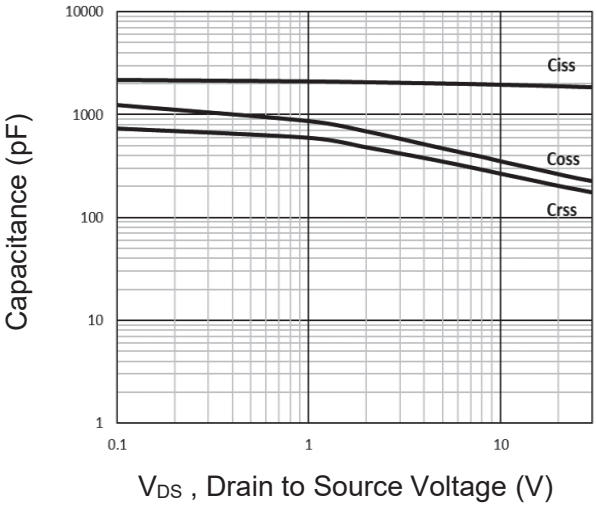


Fig.7 Capacitance Characteristics

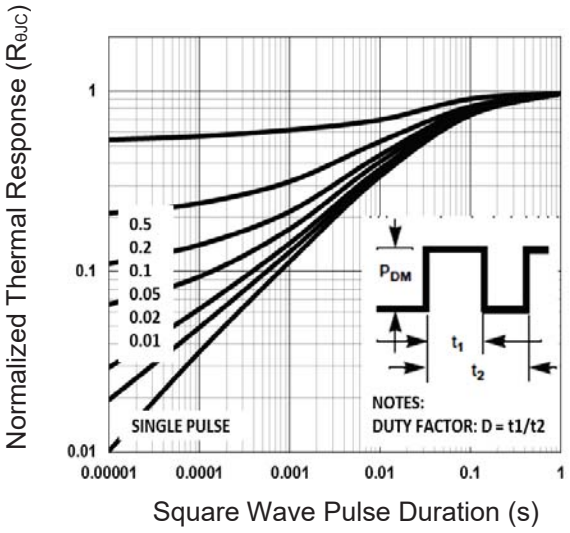


Fig.8 Normalized Transient Impedance

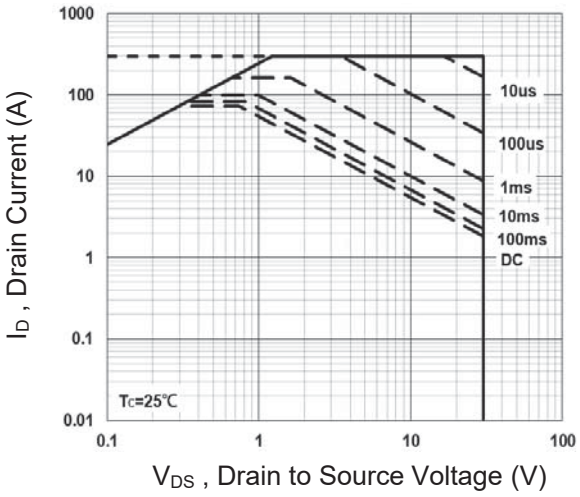


Fig.9 Maximum Safe Operation Area

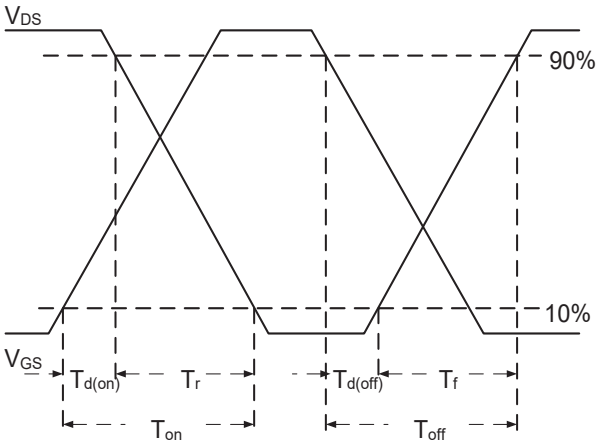


Fig.10 Switching Time Waveform

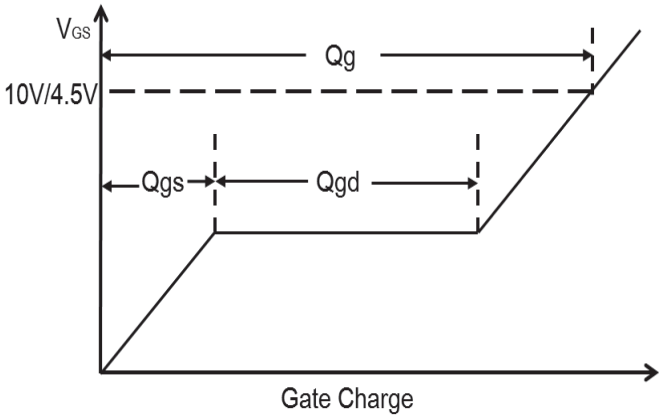
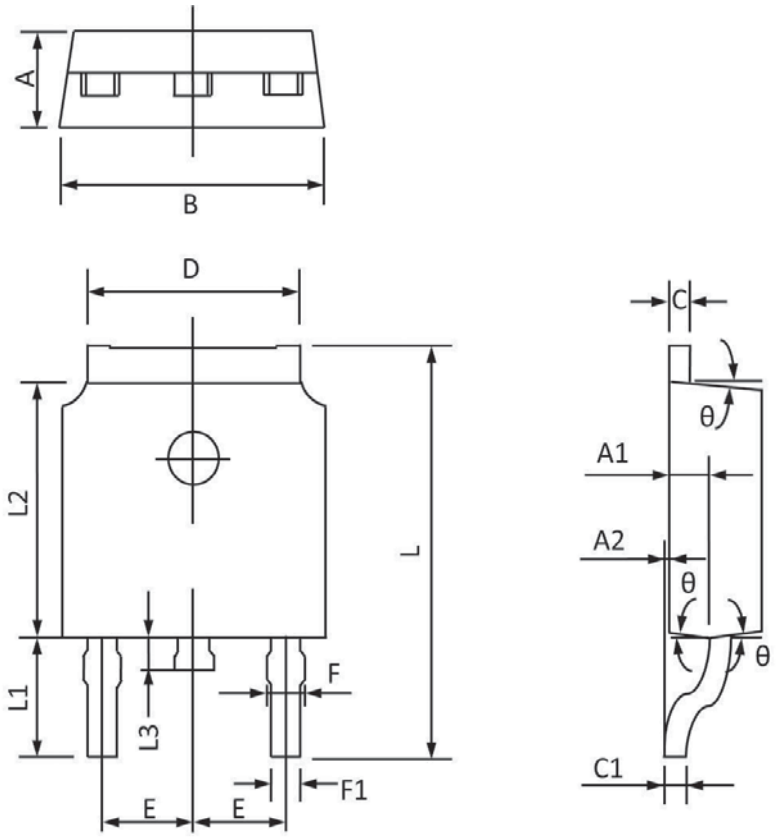


Fig.11 Gate Charge Waveform

TO-252 PACKAGE INFORMATION



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MAX	MIN	MAX	MIN
A	2.400	2.200	0.094	0.087
A1	1.110	0.910	0.044	0.036
A2	0.150	0.000	0.006	0.000
B	6.800	6.400	0.268	0.252
C	0.580	0.450	0.023	0.018
C1	0.580	0.460	0.023	0.018
D	5.500	5.100	0.217	0.201
E	2.386	2.186	0.094	0.086
F	0.940	0.600	0.037	0.024
F1	0.860	0.500	0.034	0.020
L	10.400	9.400	0.409	0.370
L1	3.000	2.400	0.118	0.094
L2	6.200	5.400	0.244	0.213
L3	1.200	0.600	0.047	0.024
θ	9°	3°	9°	3°