Dual channel 30V N-Channel MOSFET

General Description

The LPM9033 is a dual channel MOSFET, which uses advanced trench technology to provide excellent $R_{DS(ON)}$ with low gate charge. Each channel has all the features. This is an all purpose device that is suitable for use in a wide range of power conversion applications.

Features

- 100% EAS Guaranteed
- Green Device Available
- Super Low Gate Charge
- Excellent CdV/dt effect decline
- Advanced high cell density Trench technology

Order Information

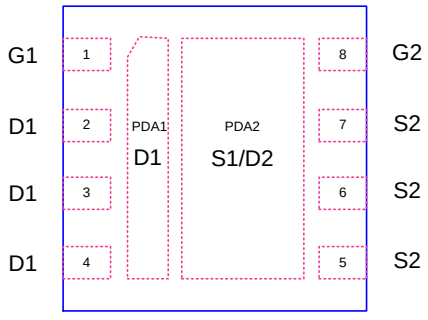
LPM9033 □ □ □

- F: Pb-Free
- Package Type
  - QV : DFN8

Applications

- Driver for Relay, Solenoid, Motor, LED etc.
- DC-DC converter circuit
- Power Switch
- Load Switch
- Charging

Pin Configurations



DFN-8

TOP VIEW

Pin Description

Pin Number	Pin Description
1	G1
2	D1
3	D1
4	D1
5	S2
6	S2
7	S2
8	G2
PDA1	D1
PAD2	S1/D1

Marking Information

Device	Marking	Package	Shipping
LPM9033QVF	LPS 9033 YWX	DFN-8	5K/REEL

Absolute Maximum Ratings

Channel 1 and channel 2 have the same maximum ratings

Parameter		Symbol	10 Sec	Steady State	Unit
Drain-Source Voltage		V_{DS}	30		V
Gate-Source Voltage		V_{GS}	±20		
Continuous Drain Current	TA=25℃	I_D	13.5	10	A
	TA=70℃		10.8	8	
Pulsed Drain Current		I_{DM}	120		
Avalanche Current		I_{AR}	23		
Repetitive avalanche energy L=0.3mH		E_{AR}	79		mJ
Power Dissipation	TA=25℃	P_D	3.1	1.7	W
	TA=70℃		2.0	1.1	
Junction and Storage Temperature Range		T_J, T_{STG}	-55 to 150		℃

Thermal resistance ratings

Parameter		Symbol	TYP	MAX	Unit
Junction-to-Case Thermal Resistance	t ≤ 10s	$R_{\theta JA}$	31	40	℃/W
Junction-to-Case Thermal Resistance	Steady State		59	75	℃/W
Maximum Junction-to-Lead	Steady State	$R_{\theta JL}$	16	24	℃/W

Electrical Characteristics

Electrical Characteristics (T_J=25℃ unless otherwise noted)
Channel 1 and channel 2 have the same electrical characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Units
STATIC PARAMETERS						
BV_{DSS}	Drain-Source Breakdown Voltage	I_D=250μA, V_{GS}=0V	30			V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=40V, V_{GS}=0V			1	μA
		T_J=55℃			5	
I_{GSS}	Gate-Body leakage current	V_{DS}=0V, V_{GS}=±20V			±100	nA
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=25μA	1.7	2.2	3	V
$I_{D(ON)}$	On state drain current	V_{GS}=10V, V_{DS}=5V	120			A
$R_{DS(ON)}$	Static Drain-Source On-Resistance	V_{GS}=10V, I_D=10A		8.2	10	mΩ
		T_J=125℃		12.5	16	
		V_{GS}=4.5V, I_D=8A		10	12.5	
g_{FS}	Forward Transconductance	V_{DS}=5V, I_D=10A		75		S
V_{SD}	Diode Forward Voltage	I_S=1A, V_{GS}=0V		0.72	1	V
I_S	Maximum Body-Diode Continuous Current				2.5	A
DYNAMIC PARAMETERS						
C_{iss}	Input Capacitance	V_{GS}=0V, V_{DS}=20V, f=1MHz		1500	1950	pF
C_{oss}	Output Capacitance			215		pF
C_{rss}	Reverse Transfer Capacitance			135		pF
R_g	Gate resistance	V_{GS}=0V, V_{DS}=0V, f=1MHz	2	3.5	5	Ω
SWITCHING PARAMETERS						
Q_g (10V)	Total Gate Charge	V_{GS}=10V, V_{DS}=20V, I_D=10A		27.2	37	nC
Q_g(4.5V)	Total Gate Charge			13.6	18	nC
Q_{gs}	Gate Source Charge			4.5		nC
Q_{gd}	Gate Drain Charge			6.4		nC
$t_{D(on)}$	Turn-On DelayTime	V_{GS}=10V, V_{DS}=20V, R_L= 2Ω, R_{GEN}=3Ω		6.4		ns
t_r	Turn-On Rise Time			17.2		ns
$t_{D(off)}$	Turn-Off DelayTime			29.6		ns
tf	Turn-Off Fall Time			16.8		ns
t_{rr}	Body Diode Reverse Recovery Time	I_F=10A, dI/dt=100A/μs		30	40	ns
Q_{rr}	Body Diode Reverse Recovery Charge	I_F=10A, dI/dt=100A/μs		19		nC

Typical Characteristics

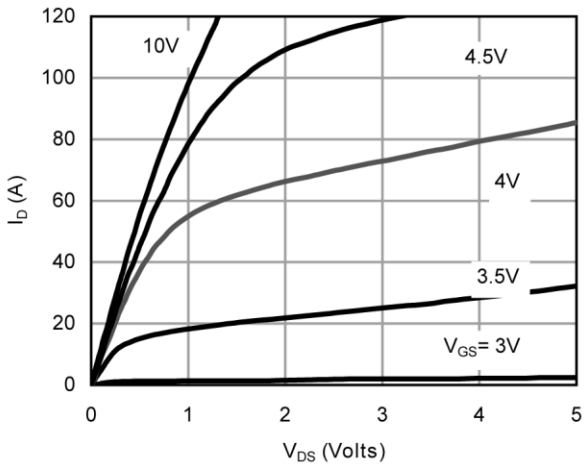


Figure 1: On-Region Characteristics

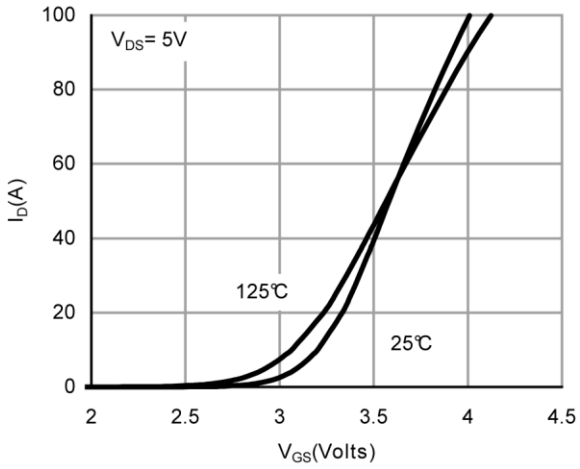


Figure 2: Transfer Characteristics

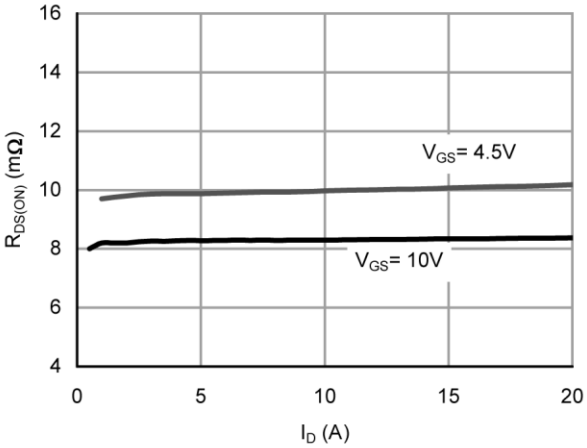


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

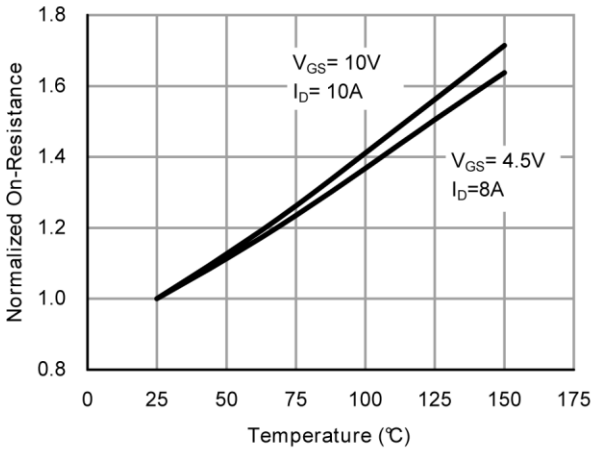


Figure 4: On-Resistance vs. Junction Temperature

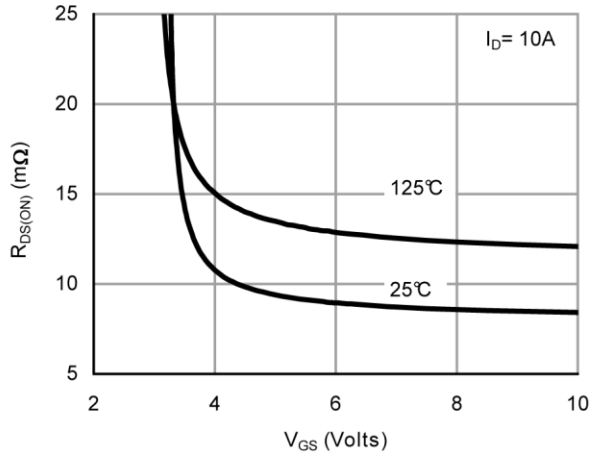


Figure 5: On-Resistance vs. Gate-Source Voltage

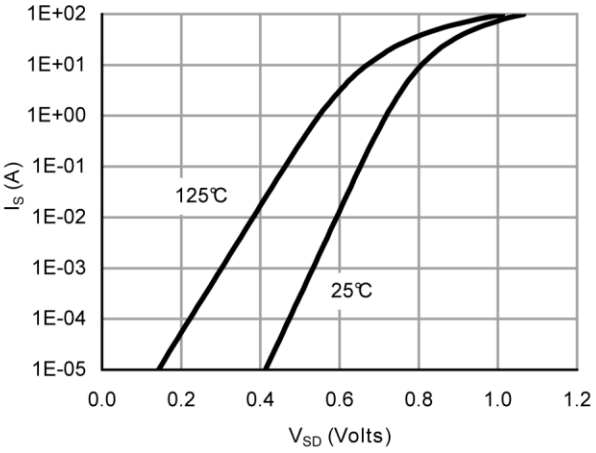


Figure 6: Body-Diode Characteristics

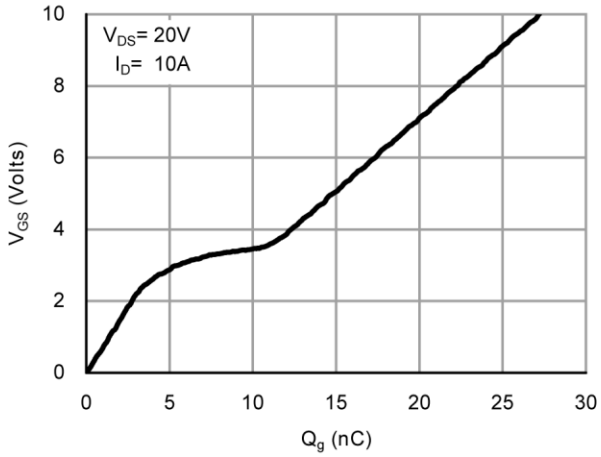


Figure 7: Gate-Charge Characteristics

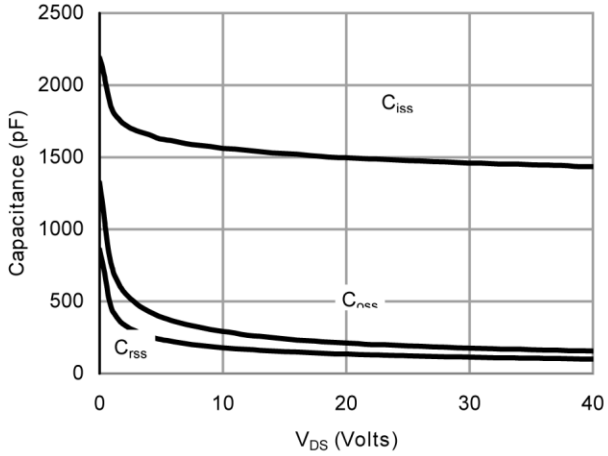


Figure 8: Capacitance Characteristics

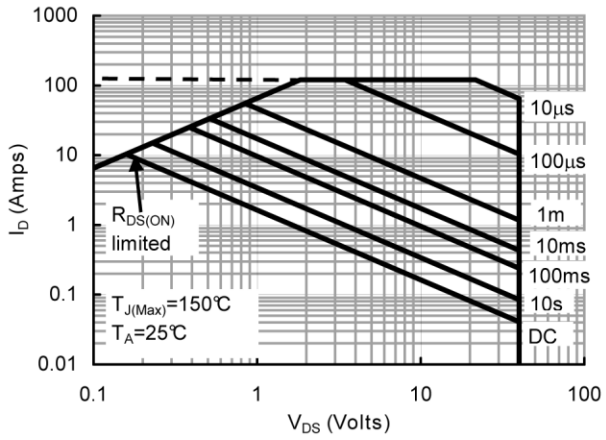


Figure 9: Maximum Forward Biased Safe Operating Area (Note E)

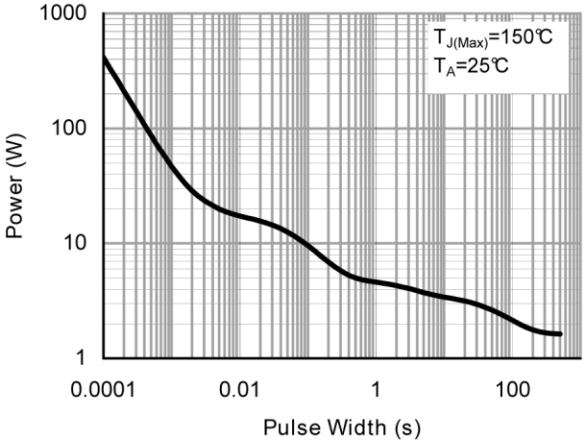


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note E)

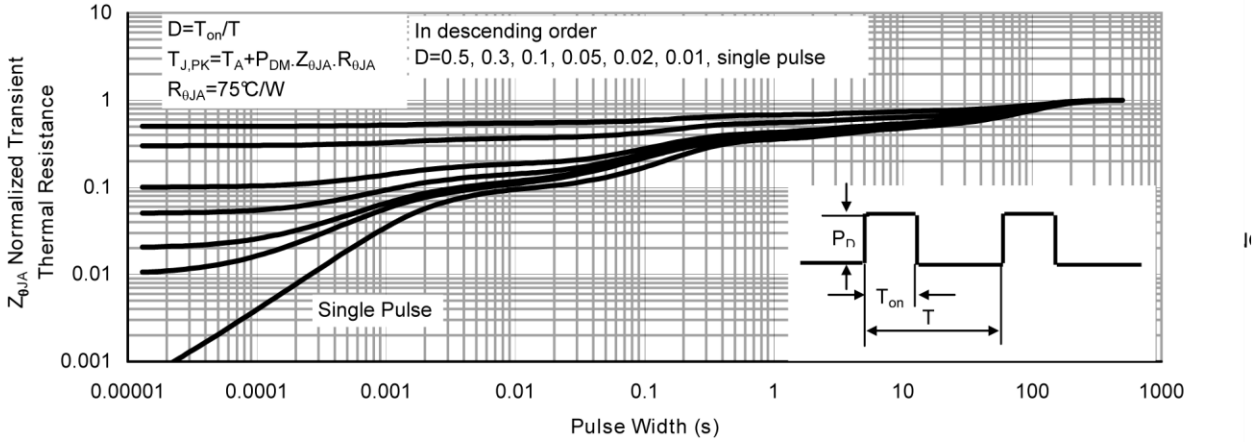
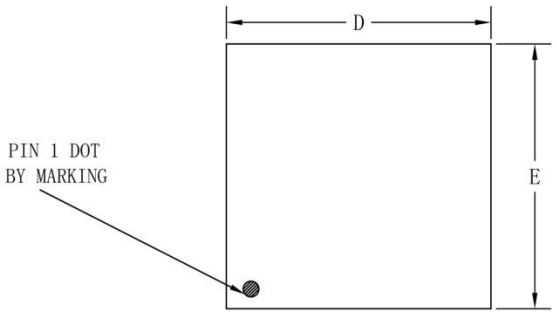


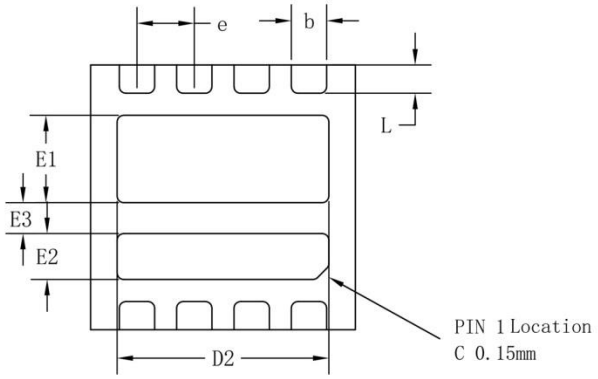
Figure 11: Normalized Maximum Transient Thermal Impedance(Note E)

Packaging Information

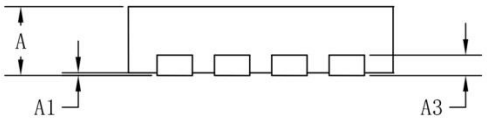
DFN8 3*3



TOP VIEW



BOTTOM VIEW



SIDE VIEW

COMMON DIMENSIONS (MM)			
PKG.	W:VERYVERY THIN		
REF.	MIN.	NOM.	MAX
A	0.70	0.75	0.80
A1	0.00	–	0.05
A3	0.20 REF.		
D	2.95	3.00	3.05
E	2.95	3.00	3.05
D2	2.30	2.40	2.50
E2	0.42	0.52	0.62
E1	0.89	0.99	1.09
E3		0.35	
b	0.35	0.40	0.45
L	0.27	0.32	0.37
e	0.65 BSC		

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