# N and P-Channel Enhancement Power MOSFET

General Description

The LPM9029C integrates N-Channel and P-Channel enhancement MOSFET Transistor. It uses advanced trench technology and design to provide excellent $R_{DS\,(ON)}$ with low gate charge. This device is suitable for using in DC-DC conversion, power switch and charging circuit.   Standard Product LPM9029C is Pb-free and Halogen-free.

Order Information

LPM9029C ☐ ☐ ☐

F: Pb-Free

Package Type
SO: SOP-8
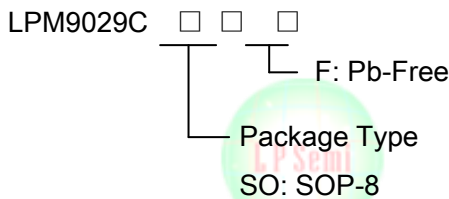
Marking Information

Device	Marking	Package	Shipping
LPM9029C		SOP-8	4K/REEL

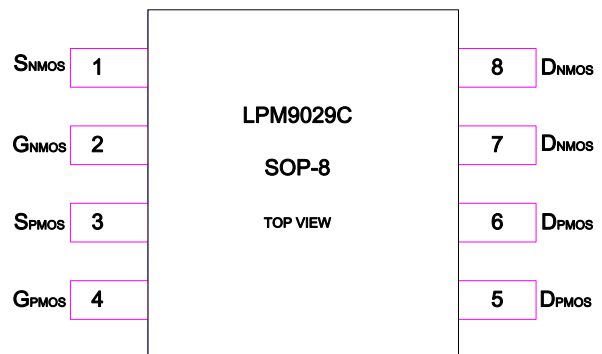## Features

◆ Trench Technology

◆ NMOS:

V_{NDS}=20V, I_{ND}=12A

$R_{NDS(ON)}$ < 26mΩ @ V_{GS}=2.5V

$R_{NDS(ON)}$ < 20mΩ @ V_{GS}=4.5V

◆ PMOS:

V_{PDS}=-20V, I_{PD}=-4.5A

$R_{PDS(ON)}$ < 100mΩ @ V_{GS}=-2.5V

$R_{PDS(ON)}$ < 68mΩ @ V_{GS}=-4.5V

◆ Super high density cell design

◆ Extremely Low Threshold Voltage

◆ Small package SOP-8

Applications

✧ Driver for Relay, Solenoid, Motor, LED etc.

✧ DC-DC converter circuit

✧ Power Switch

✧ Load Switch

✧ Charging

Pin Description

Pin Number	Pin Description
1	Source Of NMOS
2	Gate Of NMOS
3	Source Of PMOS
4	Gate Of PMOS
5,6	Drain Of PMOS
7,8	Drain Of NMOS

Pin Configurations

S_{NMOS}	1		8	D_{NMOS}
G_{NMOS}	2	LPM9029C	7	D_{NMOS}
S_{PMOS}	3	SOP-8	6	D_{PMOS}
G_{PMOS}	4	TOP VIEW	5	D_{PMOS}

Absolute Maximum Ratings

Parameter		Symbol	NMOS	PMOS	Unit
Drain-Source Voltage		V_{DS}	20	-20	V
Gate-Source Voltage		V_{GS}	±10	±10	
Continuous Drain Current	TA=25°C		12	-4.5	A
Maximum Power Dissipation	TA=25°C		1.5		W
Operating Junction Temperature		T_J	-40 to 150		°C
Lead Temperature		T_L	260		°C
Storage Temperature Range		T_{stg}	-55 to 150		°C

Thermal resistance ratings

Parameter		Symbol	Typ.	Unit
Junction-to-Ambient Thermal Resistance (Note b)	Steady State	$R_{\theta JA}$	50	°C/W
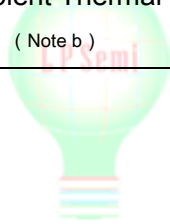
Electrical Characteristics

N-Channel MOSFET Electrical Characteristics :

Parameter	Symbol	Test Condition	Min	Typ.	Max	Units
OFF CHARACTERISTICS						
Drain-to-Source Breakdown Voltage	BV_{DSS}	V_{GS} = 0 V, I_D =250uA		20		V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} =20V, V_{GS} = 0V			500	nA
Gate-to-source Leakage Current	I_{GSS}	V_{DS} =0V, V_{GS} =±10V			±100	nA
ON CHARACTERISTICS [Note c]						
Gate Threshold Voltage	$V_{GS(TH)}$	V_{GS} = V_{DS}, I_D=250uA	0.4		0.95	V
Drain-to-source On-resistance	$R_{DS(on)}$	V_{GS} = 2.5V, I_D=3A			26	mΩ
		V_{GS} = 4.5V, I_D=6A			20	
Forward Transconductance	g_{FS}	V_{DS} =2.5V, I_D=6A	4			S
CAPACITANCES, CHARGES [Note d]						
Input Capacitance	C_{ISS}	V_{GS} = 0V, f =1.0MHz V_{DS} =15V		1550		pF
Output Capacitance	C_{OSS}			300		
Reverse Transfer Capacitance	C_{RSS}			180		
Total Gate Charge	$Q_{G(TOT)}$	V_{GS} =4.5V, V_{DS} =15V, I_D =6A		13		nC
Gate-to-Source Charge	Q_{GS}			5.5		
Gate-to-Drain Charge	Q_{GD}			3.5		
SWITCHING CHARACTERISTICS [Note d]						
Turn-On Delay Time	$t_{d(ON)}$	V_{GS} =10V, V_{DD} =20V, I_D=1.0A, R_G=6Ω		30		ns
Rise Time	t_r			20		
Turn-Off Delay Time	$t_{d(OFF)}$			100		
Fall Time	t_f			80		
BODY DIODE CHARACTERISTICS						
Forward Voltage [Note c]	V_{SD}	V_{GS} = 0 V, I_S =1A		0.2	1.0	V

P-Channel MOSFET Electrical Characteristics：

Parameter	Symbol	Test Condition	Min	Typ.	Max	Units
OFF CHARACTERISTICS						
Drain-to-Source Breakdown Voltage	BV_{DSS}	V_{GS} = 0 V, I_D =-250uA	-20			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} =-20V, V_{GS} = 0V			-500	nA
Gate-to-source Leakage Current	I_{GSS}	V_{DS} =0V, V_{GS} =±10V			±100	nA
ON CHARACTERISTICS (**Note c**)						
Gate Threshold Voltage	$V_{GS(TH)}$	V_{GS} = V_{DS}, I_D =-250uA	-0.4		-0.95	V
Drain-to-source On-resistance	$R_{DS(on)}$	V_{GS} = -2.5V, I_D =-2A			100	mΩ
		V_{GS} = -4.5V, I_D =-4.5A			68	
Forward Transconductance	g_{FS}	V_{DS} = -4.5V, I_D =-4.5A	2			S
CAPACITANCES, CHARGES (**Note d**)						
Input Capacitance	C_{ISS}	V_{GS} = 0V,		1600		pF
Output Capacitance	C_{OSS}	f = 1.0MHz		350		
Reverse Transfer Capacitance	C_{RSS}	V_{DS} =-15©©V		300		
Total Gate Charge	$Q_{G(TOT)}$	V_{GS} =- 4.5V,		30		nC
Gate-to-Source Charge	Q_{GS}	V_{DS} =-15V,		5.5		
Gate-to-Drain Charge	Q_{GD}	I_D =-4.5A		8		
SWITCHING CHARACTERISTICS (**Note d**)						
Turn-On Delay Time	$t_{d(ON)}$	V_{GS} =-10V,		10		ns
Rise Time	t_r	V_{DD} =-20V,		15		
Turn-Off Delay Time	$t_{d(OFF)}$	I_D =-1.0A,		110		
Fall Time	t_f	R_G =6Ω		70		
BODY DIODE CHARACTERISTICS						
Forward Voltage(Note c)	V_{SD}	V_{GS} = 0 V, I_S =-1A	-0.2		-0.95	V

Note：

a. Pulse width limited by maximum junction temperature.

b. Surface mounted on FR4 board, t < 10s.

c. Pulse width<295μs, Duty Cycle<2%.

d. Guaranteed by design, not subject to production.

Packaging Information
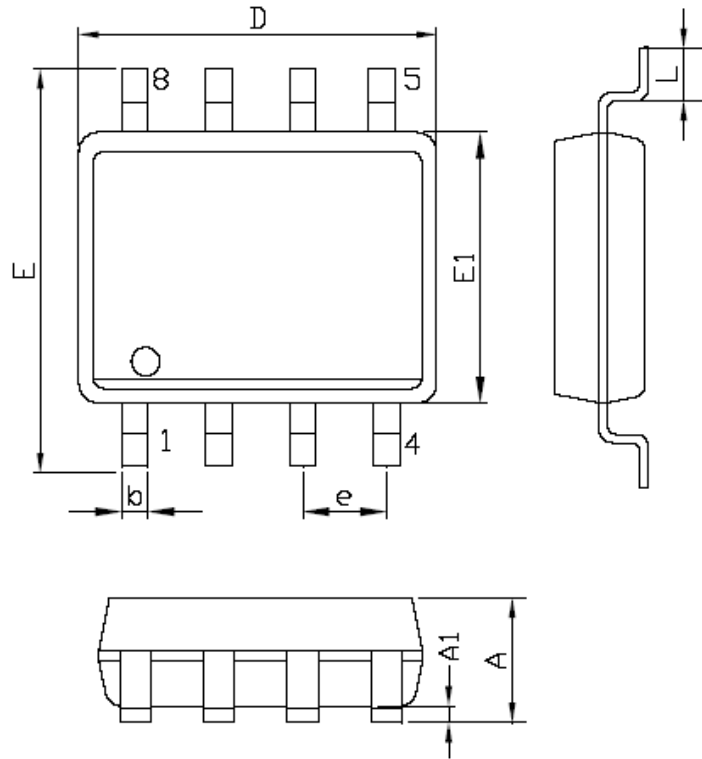
SYMBOLS	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A	1.35	1.75	0.053	0.069
A1	0.10	0.25	0.004	0.010
D	4.90		0.193	
E	5.80	6.20	0.228	0.244
E1	3.90		0.153	
L	0.40	1.27	0.016	0.050
b	0.31	0.51	0.012	0.020
e	1.27		0.050	

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