

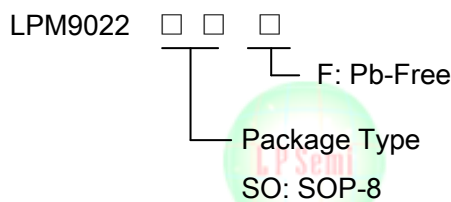


N and P-Channel Enhancement Power MOSFET

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



Marking Information

Device	Marking	Package	Shipping
LPM9029C		SOP-8	3K/REEL

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

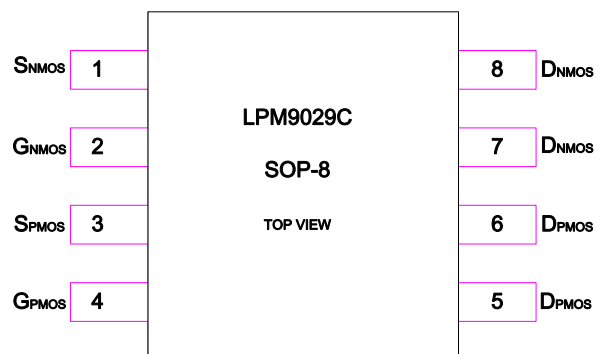
Features

- ◆ Trench Technology
- ◆ NMOS:
 - $V_{NDS}=20V, I_{ND}=12A$
 - $R_{NDS(ON)} < 26m\Omega @ V_{GS}=2.5V$
 - $R_{NDS(ON)} < 20m\Omega @ V_{GS}=4.5V$
- ◆ PMOS:
 - $V_{PDS}=-20V, I_{PD}=-4.5A$
 - $R_{PDS(ON)} < 100m\Omega @ V_{GS}=-2.5V$
 - $R_{PDS(ON)} < 68m\Omega @ V_{GS}=-4.5V$
- ◆ 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 Configurations



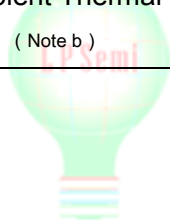


Absolute Maximum Ratings

Parameter		Symbol	NMOS	PMOS	Unit
Drain-Source Voltage		V_{DS}	30	-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}	$V_{GS} = 0V, I_D = 250\mu A$		20		V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 20V, V_{GS} = 0V$			500	nA
Gate-to-source Leakage Current	I_{GSS}	$V_{DS} = 0V, V_{GS} = \pm 10V$			± 100	nA
ON CHARACTERISTICS (Note c)						
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{GS} = V_{DS}, I_D = 250\mu A$	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	$t_{d(ON)}$	$V_{GS} = 10V,$ $V_{DD} = 20V,$ $I_D = 1.0A,$ $R_G = 6\Omega$		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}	$V_{GS} = 0V, I_S = 1A$		0.2	1.0	V



P-Channel MOSFET Electrical Characteristics :

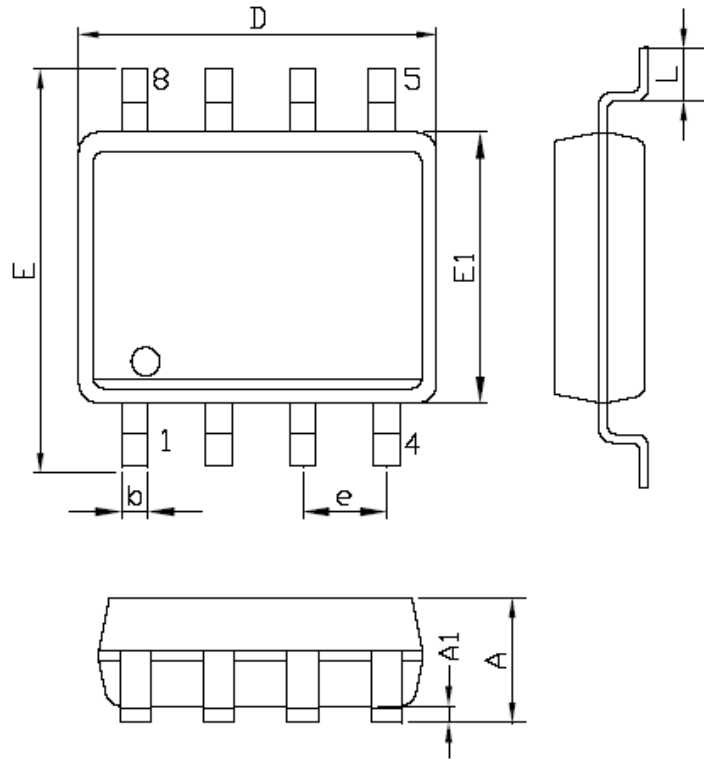
Parameter	Symbol	Test Condition	Min	Typ.	Max	Units
OFF CHARACTERISTICS						
Drain-to-Source Breakdown Voltage	BV_{DSS}	$V_{GS} = 0V, I_D = -250\mu A$	-20			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = -20V, V_{GS} = 0V$			-500	nA
Gate-to-source Leakage Current	I_{GSS}	$V_{DS} = 0V, V_{GS} = \pm 10V$			± 100	nA
ON CHARACTERISTICS (Note c)						
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{GS} = V_{DS}, I_D = -250\mu A$	-0.4		-0.95	V
Drain-to-source On-resistance	$R_{DS(on)}$	$V_{GS} = -2.5V, I_D = -2A$			100	m Ω
		$V_{GS} = -4.5V, I_D = -4.5A$			68	
Forward Transconductance	g_{FS}	$V_{DS} = -4.5V, I_D = -4.5A$	2			S
CAPACITANCES, CHARGES (Note d)						
Input Capacitance	C_{ISS}	$V_{GS} = 0V,$ $f = 1.0MHz$ $V_{DS} = -15\text{V}$		1600		pF
Output Capacitance	C_{OSS}			350		
Reverse Transfer Capacitance	C_{RSS}			300		
Total Gate Charge	$Q_{G(TOT)}$	$V_{GS} = -4.5V,$ $V_{DS} = -15V,$ $I_D = -4.5A$		30		nC
Gate-to-Source Charge	Q_{GS}			5.5		
Gate-to-Drain Charge	Q_{GD}			8		
SWITCHING CHARACTERISTICS (Note d)						
Turn-On Delay Time	$t_{d(ON)}$	$V_{GS} = -10V,$ $V_{DD} = -20V,$ $I_D = -1.0A,$ $R_G = 6\Omega$		10		ns
Rise Time	t_r			15		
Turn-Off Delay Time	$t_{d(OFF)}$			110		
Fall Time	t_f			70		
BODY DIODE CHARACTERISTICS						
Forward Voltage(Note c)	V_{SD}	$V_{GS} = 0V, I_S = -1A$	-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 $< 295\mu s$, 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	