

-15V,16A P-Channel Power MOSFET

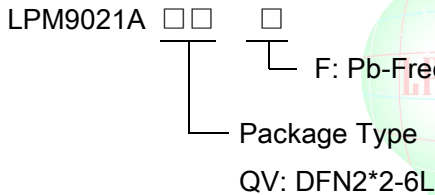
General Description

The LPM9021A is P-Channel enhancement MOSFET Effect 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 LPM9021AQVF is Pb-free and Halogen-free.

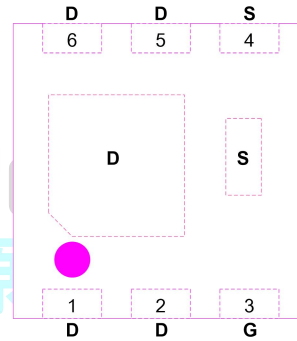
Features

- $V_{DS}=-15V$, $I_D=-16A$
 $R_{DS(ON)}=13m\Omega(\text{typ.})@V_{GS}=-4.5V$
 $R_{DS(ON)}=20m\Omega(\text{typ.})@V_{GS}=-2.5V$
- Super high density cell design for extremely low $R_{DS(ON)}$
- DFN2*2-6 Package

Order Information



Pin Configurations



Applications

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

Pin Number	Pin Description
1,2	Drain Pin
3	Gate Pin
4	Source Pin
5,6	Drain Pin

Marking Information

Device	Marking	Package	Shipping
LPM9021AQVF	LPS M3YWX	DFN2*2-6L	4K/REEL

Marking indication:

Y:Production year W:Production week X: Series Number

Absolute Maximum Ratings

Parameter	Symbol	Limit	Unit	
Drain-Source Voltage	V _{DS}	-15	V	
Gate-Source Voltage	V _{GS}	±12		
Pulsed Drain Current(Note C)	I _{DM}	-46	A	
Maximum Power Dissipation(Note A)	P _D	TA=25°C	2.8	W
		TA=70°C	1.8	
Continuous Drain Current(Note F)	I _D	-16	A	
Operating Junction Temperature	T _J	-55 to 150	°C	
Maximum Soldering Temperature (at leads, 10 sec)		260	°C	
Storage Temperature Range	T _{stg}	-55 to 150	°C	

Thermal resistance ratings

Parameter	Symbol	Typical	Unit	
Junction-to-Ambient Thermal Resistance(Note A)	R _{θJA}	t ≤ 10 s	40	°C/W
		Steady State	70	

A. The value of R_{θJA} is measured with the device mounted on 1in2 FR-4 board with 2oz. Copper, in a still air environment with TA =25°C. The Power dissipation PDSM is based on R_{θJA} t ≤ 10s value and the maximum allowed junction temperature of 150°C. The value in any given application depends on the user's specific board design.

B. The power dissipation PD is based on T_J(MAX)=150°C, using junction-to-case thermal resistance, and is more useful in setting the upper dissipation limit for cases where additional heatsinking is used.

C. Repetitive rating, pulse width limited by junction temperature T_J(MAX)=150°C. Ratings are based on low frequency and duty cycles to keep initial T_J =25°C.

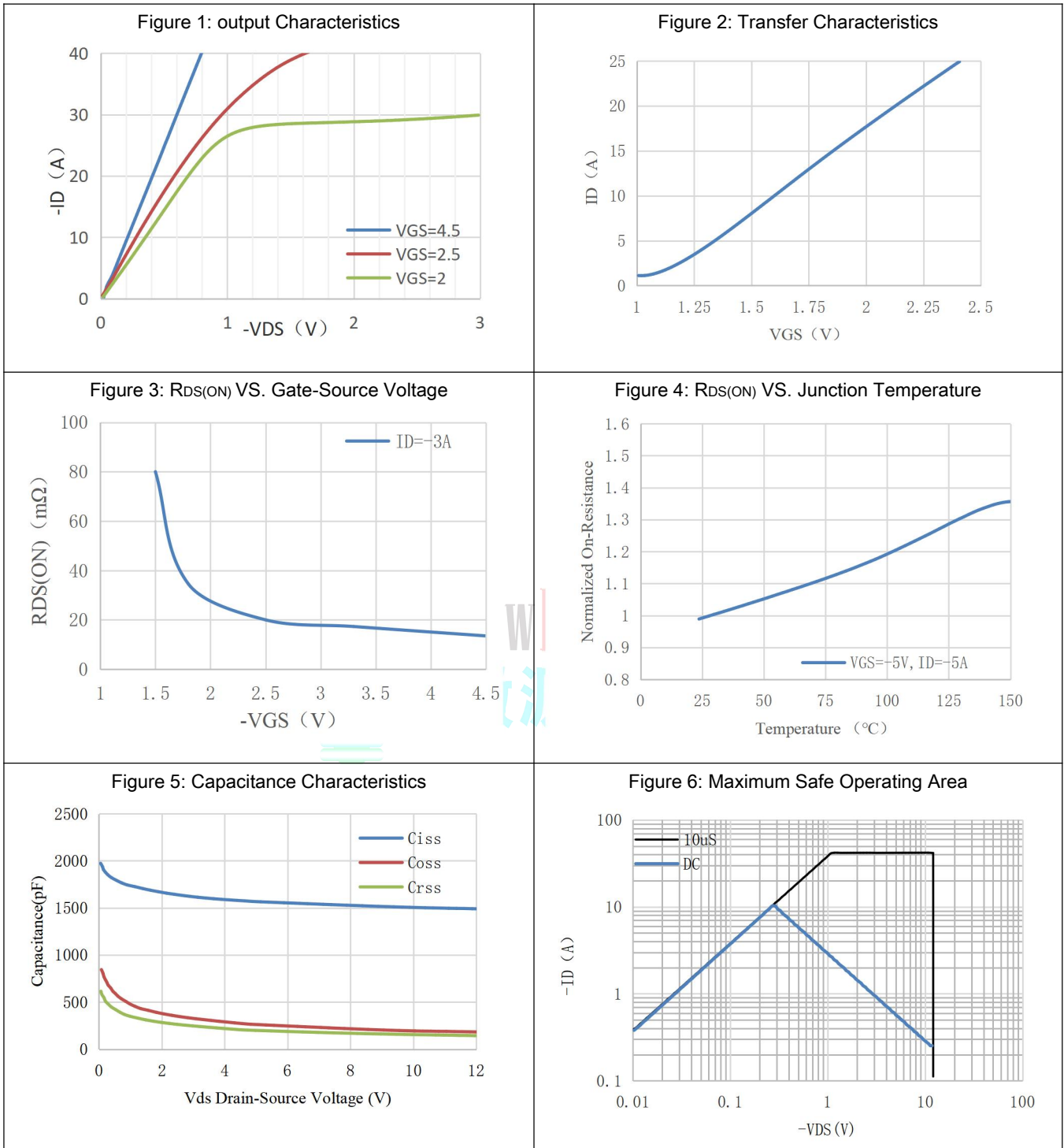
D. These curves are based on the junction-to-case thermal impedance which is measured with the device mounted to a large heatsink, assuming a maximum junction temperature of T_J(MAX)=150°C. The SOA curve provides a single pulse rating.

E. The maximum current rating is package limited.

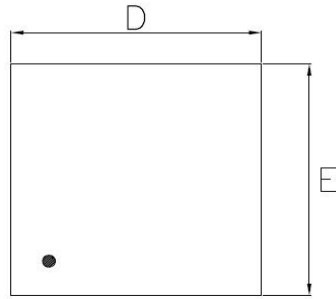
Electrical Characteristics

Parameter	Symbol	Test Condition	Min	Typ.	Max	Units
OFF CHARACTERISTICS						
Drain-to-Source Breakdown Voltage	BV _{DSS}	V _{GS} = 0 V, I _D = -250uA	-15			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = -12V, V _{GS} = 0V			-1	uA
Gate-to-source Leakage Current	I _{GSS}	V _{DS} = 0 V, V _{GS} = ±10V			±100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	V _{GS(TH)}	V _{GS} = V _{DS} , I _D = -250uA	-0.5	-0.7	-1.0	V
Drain-to-source On-resistance b, c	R _{DS(on)}	V _{GS} = -4.5V, I _D = -16A		13		mΩ
		V _{GS} = -2.5V, I _D = -16A		20		
Forward Transconductance	g _{FS}	V _{DS} = -5V, I _D = -5A		14		S
CAPACITANCES, CHARGES						
Input Capacitance	C _{ISS}	V _{GS} = 0 V, f = 1.0 MHz V _{DS} = -10 V		1400		pF
Output Capacitance	C _{OSS}			325		
Reverse Transfer Capacitance	C _{RSS}			280		
Total Gate Charge	Q _G	V _{GS} = -4.5 V, V _{DD} = -10 V, I _D = -5A		16		nC
Gate-to-Source Charge	Q _{GS}			3.5		
Gate-to-Drain Charge	Q _{GD}			4.2		
SWITCHING CHARACTERISTICS						
Turn-On Delay Time	t _{d(ON)}	V _{GS} = -4.5 V, V _{DD} = -10 V, R _L = 2 Ω, R _G = 3 Ω		16		ns
Rise Time	t _r			65		
Turn-Off Delay Time	t _{d(OFF)}			74		
Fall Time	t _f			63		
BODY DIODE CHARACTERISTICS						
Forward Voltage	V _{SD}	V _{GS} = 0 V, I _S = -2.0A	-	-0.7	1.2	V

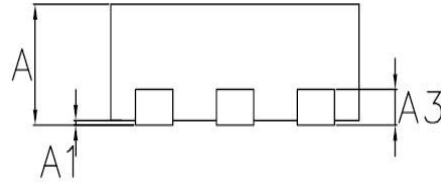
Typical Characteristics (Ta=25°C, unless otherwise noted)



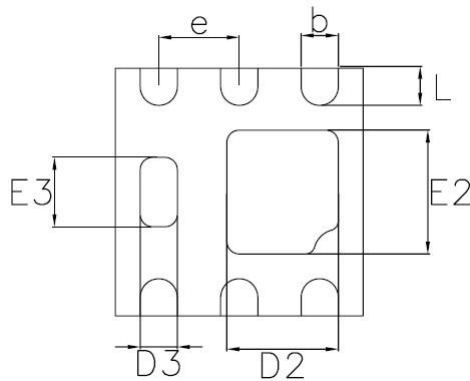
Packaging Information



Top View



Side View



Bottom View

Symbol	Dimensions in millimeter		
	Min	Typ	Max
A	0.70	0.75	0.80
A1	0.00	-	0.05
A3	0.203 Ref.		
D	1.95	2.00	2.05
E	1.95	2.00	2.05
D2	0.85	0.90	0.95
E2	0.75	0.80	0.85
D3	0.25	0.30	0.35
E3	0.51	0.56	0.61
b	0.25	0.30	0.35
L	0.30	0.35	0.40
e	0.65 BSC.		