




# Power MOSFETS


## DATASHEET

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**LM30072PAN3A**

P-Channel  
Enhancement Mode MOSFET

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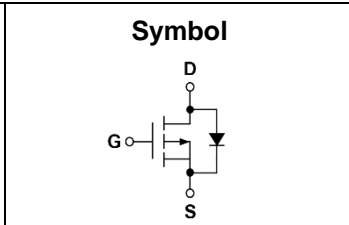
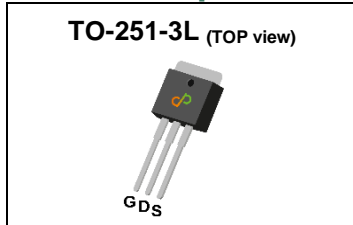


Quality Management Systems

ISO 9001:2015 Certificate

## P-Channel Enhancement Mode MOSFET

### Pin Description



### Ordering Information

Symbol	P-Channel	Unit
$V_{DSS}$	-30	V
$R_{DS(ON)-Max}$	8	m $\Omega$
$I_D$	-88	A

### Feature

- Low Rdson application
- Reliable and Rugged
- ROHS Compliant & Halogen-Free
- 100% UIS and Rg Tested

### Applications

- DC-DC converters
- Battery Powered System

### Ordering Information

Orderable Part Number	Package Type	Form	Shipping	Marking
LM30072PAN3A	TO-251-3L	Tube	75 / Tube	30072 □□□□□□

Note : □□□□□□ = Lot Code

### Absolute Maximum Ratings (T<sub>J</sub>=25°C Unless Otherwise Noted)

Symbol	Parameter	P-Channel	Unit
$V_{DSS}$	Drain-Source Voltage	-30	V
$V_{GSS}$	Gate-Source Voltage	±20	
$T_J$	Maximum Junction Temperature	150	°C
$T_{STG}$	Storage Temperature Range	-55 to 150	°C
$I_S$	Diode Continuous Forward Current	$T_C=25^\circ C$ -57	A
$I_{DM}^{(1)}$	Pulse Drain Current Tested	$T_C=25^\circ C$ -221	A
$I_D$	Continuous Drain Current	$T_C=25^\circ C$ -88	A
		$T_C=100^\circ C$ -56	
$P_D$	Maximum Power Dissipation	$T_C=25^\circ C$ 62.5	W
		$T_C=100^\circ C$ 25	
$I_D$	Continuous Drain Current	$T_A=25^\circ C$ -16	A
		$T_A=70^\circ C$ -13	
$P_D$	Maximum Power Dissipation	$T_A=25^\circ C$ 2	W
		$T_A=70^\circ C$ 1.3	
$I_{AS}^{(2)}$	Avalanche Current, Single pulse	L=0.1mH -33	A
		L=0.5mH -15	
$E_{AS}^{(2)}$	Avalanche Energy, Single pulse	L=0.1mH 54	mJ
		L=0.5mH 56	

### Thermal Characteristics

Symbol	Parameter	Rating	Unit
$R_{\theta JC}$	Thermal Resistance-Junction to Case	Steady State 2	°C/W
$R_{\theta JA}^{(3)}$	Thermal Resistance-Junction to Ambient	Steady State 62.5	°C/W

Note ① : Max. current is limited by junction temperature

Note ② : UIS tested and pulse width are limited by maximum junction temperature 150°C.

Note ③ : Surface Mounted on 1in<sup>2</sup> FR-4 board with 1oz.

## P-Channel Electrical Characteristics (T<sub>J</sub>=25°C Unless Otherwise Noted)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
<b>Static Electrical Characteristics</b>						
<b>BV<sub>DSS</sub></b>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>DS</sub> =-250uA	-30	-	-	V
<b>I<sub>DSS</sub></b>	Zero Gate Voltage Drain Current	V <sub>DS</sub> =-24V, V <sub>GS</sub> =0V	-	-	-1	uA
<b>V<sub>GS(th)</sub></b>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>DS</sub> =-250uA	-1	-1.5	-2	V
<b>I<sub>GSS</sub></b>	Gate Leakage Current	V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V	-	-	±100	nA
<b>R<sub>DS(ON)</sub></b> <sup>④</sup>	Drain-Source On-state Resistance	V <sub>GS</sub> =-10V, I <sub>DS</sub> =-12A	-	6.5	8	mΩ
		V <sub>GS</sub> =-4.5V, I <sub>DS</sub> =-9A	-	8.2	10.7	
<b>g<sub>fs</sub></b>	Forward Transconductance	V <sub>DS</sub> =-5V, I <sub>DS</sub> =-12A	-	35	-	S
<b>Dynamic Characteristics</b> <sup>®</sup>						
<b>R<sub>G</sub></b>	Gate Resistance	V <sub>GS</sub> =0V, V <sub>DS</sub> =0V, Freq.=1MHz	-	11	-	Ω
<b>C<sub>iss</sub></b>	Input Capacitance	V <sub>GS</sub> =0V, V <sub>DS</sub> =-15V, Freq.=1MHz	-	4435	-	pF
<b>C<sub>oss</sub></b>	Output Capacitance					
<b>C<sub>rss</sub></b>	Reverse Transfer Capacitance					
<b>t<sub>d(ON)</sub></b>	Turn-on Delay Time	V <sub>GS</sub> =-10V, V <sub>DS</sub> =-15V, I <sub>D</sub> =-1A, R <sub>GEN</sub> =3Ω	-	51	-	nS
<b>t<sub>r</sub></b>	Turn-on Rise Time					
<b>t<sub>d(OFF)</sub></b>	Turn-off Delay Time					
<b>t<sub>f</sub></b>	Turn-off Fall Time					
<b>Q<sub>g</sub></b>	Total Gate Charge	V <sub>GS</sub> =-4.5V, V <sub>DS</sub> =-15V, I <sub>D</sub> =-10A	-	42	-	nC
<b>Q<sub>g</sub></b>	Total Gate Charge	V <sub>GS</sub> =-10V, V <sub>DS</sub> =-15V, I <sub>D</sub> =-10A	-	88	-	
<b>Q<sub>gs</sub></b>	Gate-Source Charge		-	15	-	
<b>Q<sub>gd</sub></b>	Gate-Drain Charge		-	8.6	-	
<b>Source-Drain Characteristics</b>						
<b>V<sub>SD</sub></b> <sup>④</sup>	Diode Forward Voltage	I <sub>SD</sub> =-3.6A, V <sub>GS</sub> =0V	-	-0.75	-1.1	V
<b>t<sub>rr</sub></b>	Reverse Recovery Time	I <sub>F</sub> =-3.6A, V <sub>R</sub> =-10V	-	25	-	nS
<b>Q<sub>rr</sub></b>	Reverse Recovery Charge	dI <sub>F</sub> /dt=100A/μs	-	15	-	nC

Note ④ : Pulse test (pulse width≤300us, duty cycle≤2%).

Note ⑤ : Guaranteed by design, not subject to production testing.

## P-Channel Typical Characteristics

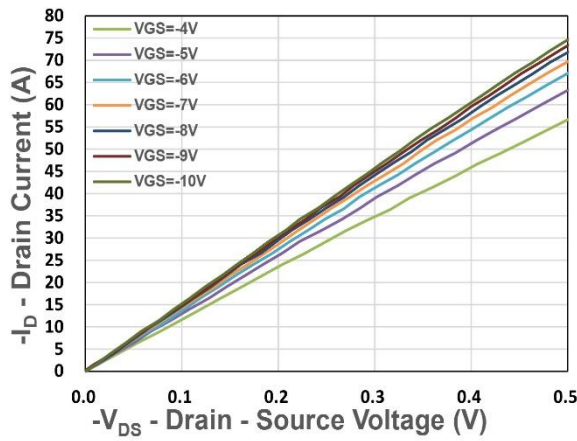


Figure 1. Output Characteristics

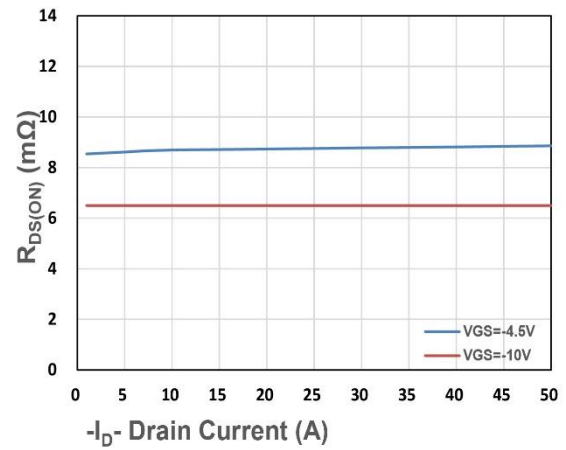


Figure 2. On-Resistance vs. ID

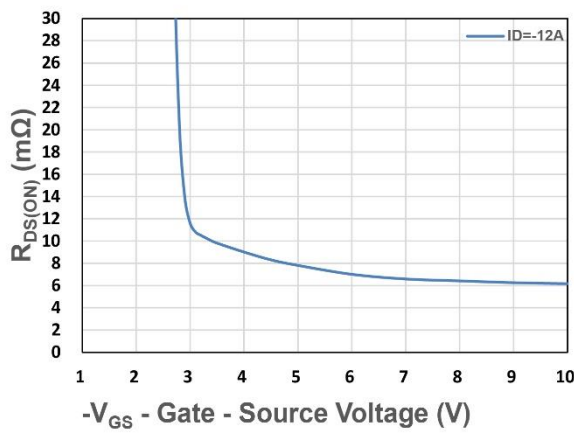


Figure 3. On-Resistance vs. VGS

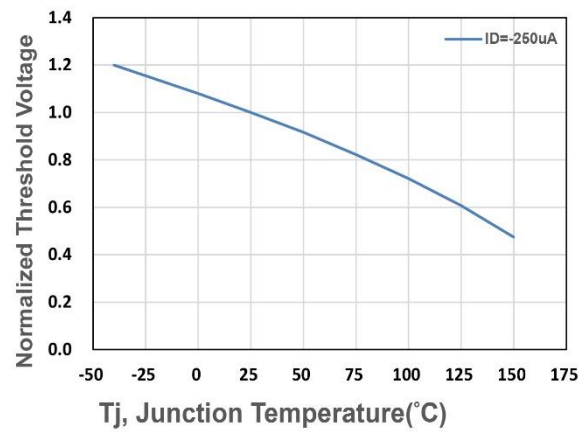


Figure 4. Gate Threshold Voltage

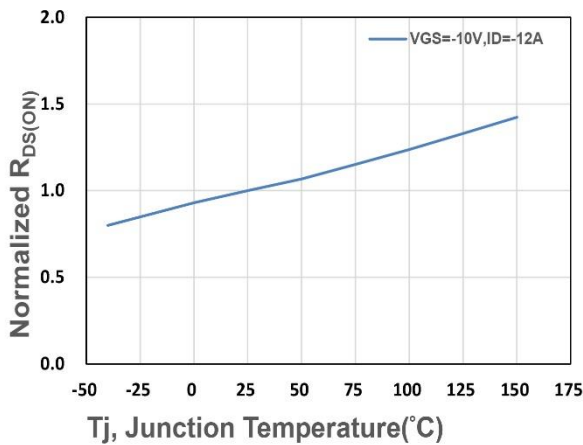


Figure 5. Drain-Source On Resistance

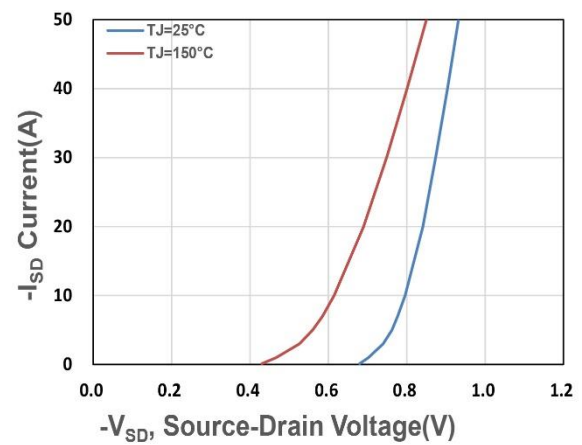
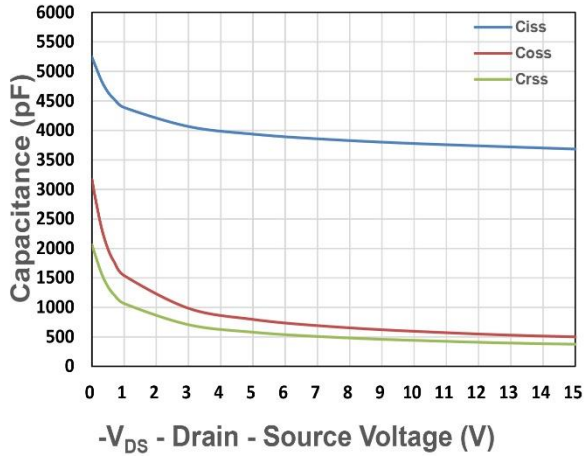


Figure 6. Source-Drain Diode Forward



-V<sub>DS</sub> - Drain - Source Voltage (V)  
Figure 7. Capacitance

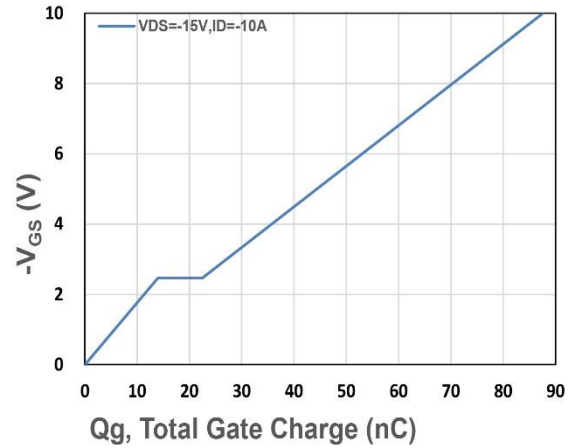


Figure 8. Gate Charge Characteristics

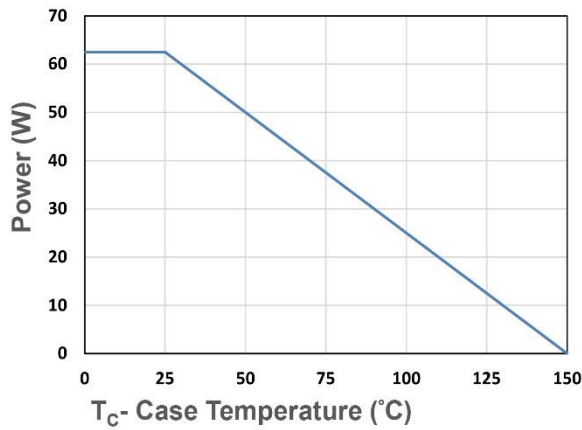


Figure 9. Power Dissipation

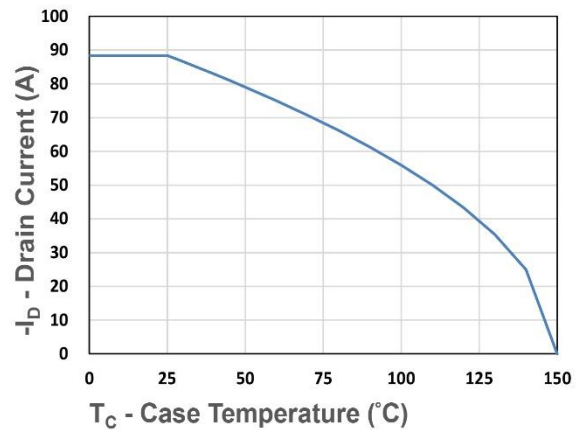


Figure 10. Drain Current

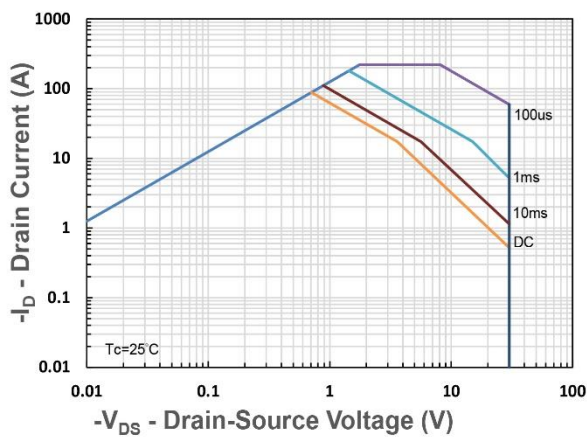


Figure 11. Safe Operating Area

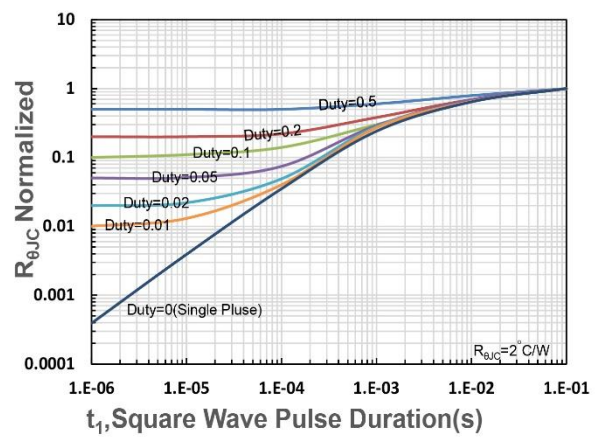


Figure 12. R<sub>θjC</sub> Transient Thermal Impedance