




Power MOSFETS

DATASHEET

LM30120DAK8A

Dual N-Channel
Enhancement Mode MOSFET

 Leadpower-semiconductor Corp., Ltd

 sales@leadpower-semi.com

 (03) 6577339 FAX : (03) 6577229

 www.leadpower-semi.com

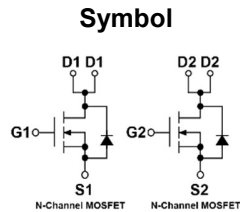
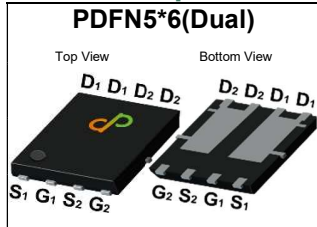


Quality Management Systems

ISO 9001:2015 Certificate

Dual N-Channel Enhancement Mode MOSFET

Pin Description



Product Summary

| Symbol | Dual N-Channel | Unit |
|------------------|----------------|------------|
| V_{DSS} | 30 | V |
| $R_{DS(ON)-Max}$ | 12 | m Ω |
| ID | 30 | A |

Feature

- Fast switching speed
- Reliable and Rugged
- ROHS Compliant & Halogen-Free
- 100% UIS and Rg Tested

Applications

- DC-DC Converters
- Portable equipment application

Ordering Information

| Orderable Part Number | Package Type | Form | Shipping | Marking |
|-----------------------|----------------|-------------|--------------------|-----------------|
| LM30120DAK8A | PDFN5*6 (Dual) | Tape & Reel | 5000 / Tape & Reel | 30120 □□□□□□ |

Note : □□□□□□ = Lot Code

Absolute Maximum Ratings (T_J=25°C Unless Otherwise Noted)

| Symbol | Parameter | Dual N-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 | |
| $I_{DM}^{①}$ | Pulse Drain Current Tested | T _c =25°C | 38 | A |
| I_D | Continuous Drain Current | T _c =25°C | 30 | A |
| | | T _c =100°C | 19 | |
| P_D | Maximum Power Dissipation | T _c =25°C | 18 | W |
| | | T _c =100°C | 7 | |
| $I_{AS}^{②}$ | Avalanche Current, Single pulse | L=0.1mH | 18 | A |
| $E_{AS}^{③}$ | Avalanche Energy, Single pulse | L=0.1mH | 16 | mJ |

Thermal Characteristics

| Symbol | Parameter | Rating | Unit | |
|---------------------|--|--------------|------|------|
| $R_{\theta JC}$ | Thermal Resistance-Junction to Case | Steady State | 7 | °C/W |
| $R_{\theta JA}^{③}$ | Thermal Resistance-Junction to Ambient | Steady State | 100 | °C/W |

Note ① : Max. current is limited by bonding wire

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

Note ③ : Surface Mounted on 1in² FR-4 board with 1oz.

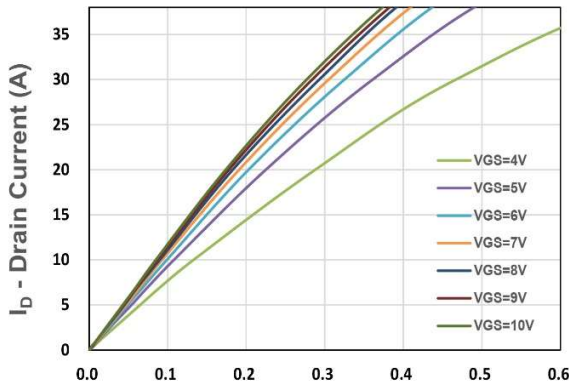
Dual N-Channel Electrical Characteristics (T_J=25°C Unless Otherwise Noted)

| Symbol | Parameter | Test Conditions | Min. | Typ. | Max. | Unit |
|---|----------------------------------|--|------|------|------|------|
| Static Electrical Characteristics | | | | | | |
| BV_{DSS} | Drain-Source Breakdown Voltage | V _{GS} =0V, I _{DS} =250uA | 30 | - | - | V |
| I_{DSS} | Zero Gate Voltage Drain Current | V _{DS} =24V, V _{GS} =0V | - | - | 1 | uA |
| V_{GS(th)} | Gate Threshold Voltage | V _{DS} =V _{GS} , I _{DS} =250uA | 1.1 | 1.6 | 2.1 | V |
| I_{GSS} | Gate Leakage Current | V _{GS} =±20V, V _{DS} =0V | - | - | ±100 | nA |
| R_{DS(ON)} ^④ | Drain-Source On-state Resistance | V _{GS} =10V, I _{DS} =10A | - | 10 | 12 | mΩ |
| | | V _{GS} =4.5V, I _{DS} =6A | - | 12 | 16 | |
| gfs | Forward Transconductance | V _{DS} =5V, I _{DS} =5A | - | 2.5 | - | S |
| Dynamic Characteristics ^⑤ | | | | | | |
| R_G | Gate Resistance | V _{GS} =0V, V _{DS} =0V, Freq.=1MHz | - | 3 | - | Ω |
| C_{iss} | Input Capacitance | V _{GS} =0V, V _{DS} =15V, Freq.=1MHz | - | 872 | - | pF |
| C_{oss} | Output Capacitance | | - | 112 | - | |
| C_{rss} | Reverse Transfer Capacitance | | - | 104 | - | |
| td(ON) | Turn-on Delay Time | V _{GS} =10V, V _{DS} =15V, I _D =1A, R _{GEN} =6Ω | - | 17 | - | nS |
| t_r | Turn-on Rise Time | | - | 30 | - | |
| t_{d(OFF)} | Turn-off Delay Time | | - | 30 | - | |
| t_f | Turn-off Fall Time | | - | 16 | - | |
| Q_g | Total Gate Charge | V _{GS} =4.5V, V _{DS} =15V, I _D =10A | - | 10.3 | - | nC |
| Q_g | Total Gate Charge | V _{GS} =10V, V _{DS} =15V, I _D =10A | - | 20.5 | - | |
| Q_{gs} | Gate-Source Charge | | - | 2.32 | - | |
| Q_{gd} | Gate-Drain Charge | | - | 4.8 | - | |
| Source-Drain Characteristics | | | | | | |
| V_{SD} ^④ | Diode Forward Voltage | I _{SD} =1A, V _{GS} =0V | - | 0.7 | 1.1 | V |
| t_{rr} | Reverse Recovery Time | I _F =1A, V _R =20V | - | 25.4 | - | nS |
| Q_{rr} | Reverse Recovery Charge | dI _F /dt=100A/μs | - | 10.7 | - | nC |

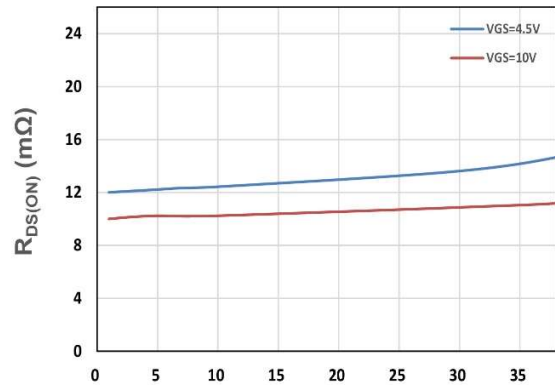
Note ④ : Pulse test (pulse width≤300us, duty cycle≤2%).

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

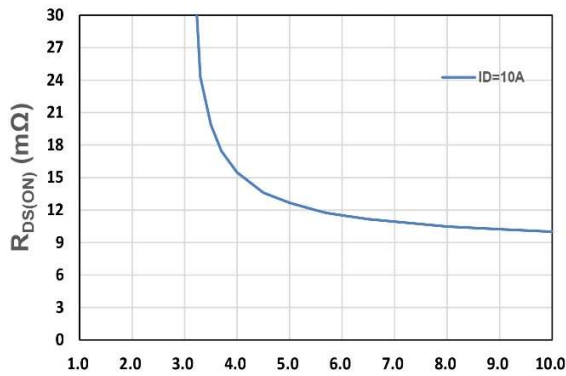
Dual N-Channel Typical Characteristics



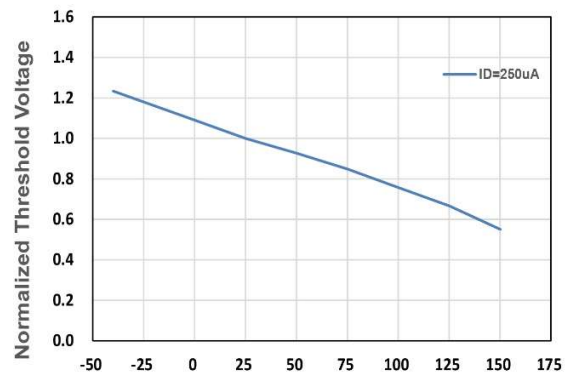
V_{DS} - Drain - Source Voltage (V)
Figure 1. Output Characteristics



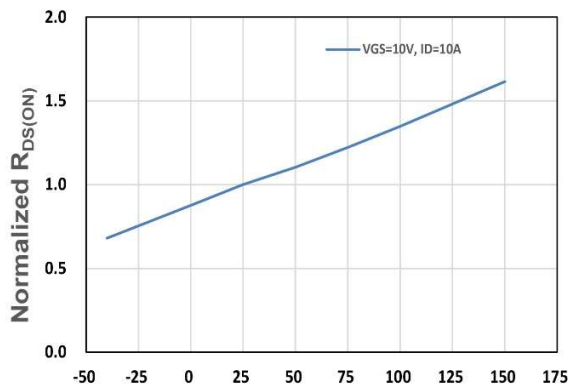
I_D - Drain Current (A)
Figure 2. On-Resistance vs. ID



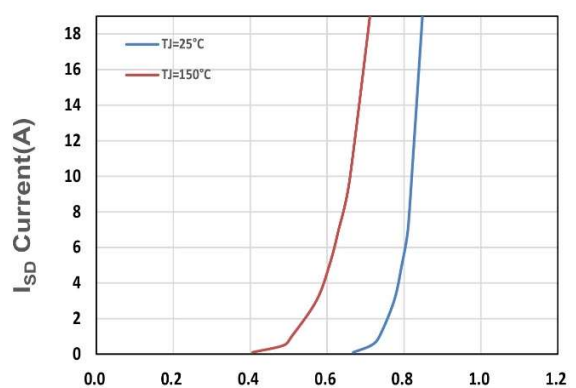
V_{GS} - Gate - Source Voltage (V)
Figure 3. On-Resistance vs. VGS



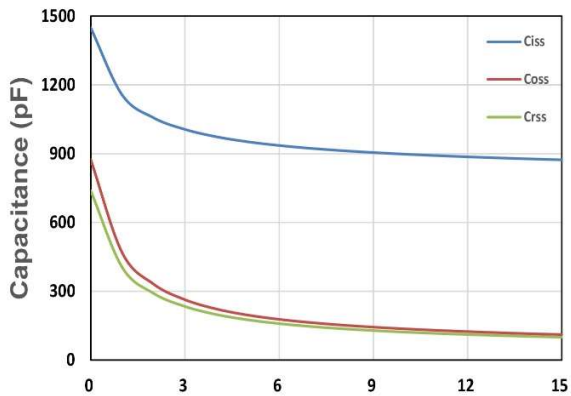
T_j , Junction Temperature($^{\circ}C$)
Figure 4. Gate Threshold Voltage



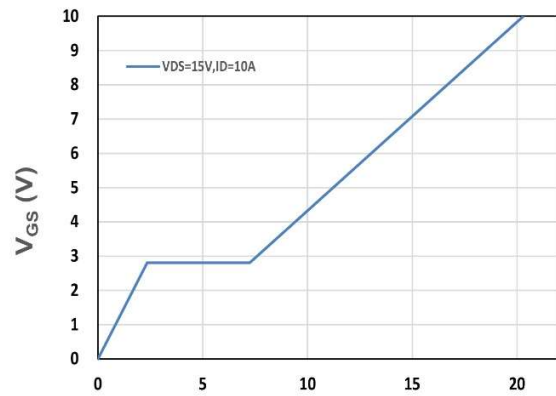
T_j , Junction Temperature($^{\circ}C$)
Figure 5. Drain-Source On Resistance



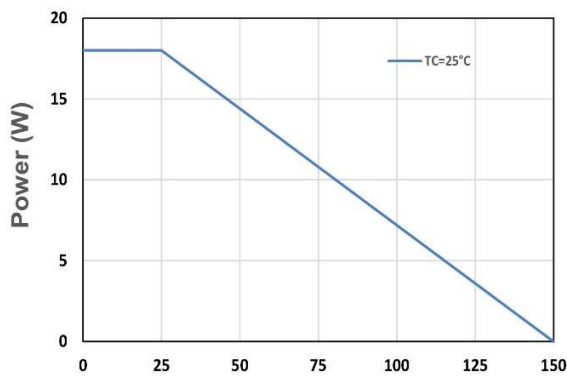
V_{SD} , Source-Drain Voltage(V)
Figure 6. Source-Drain Diode Forward



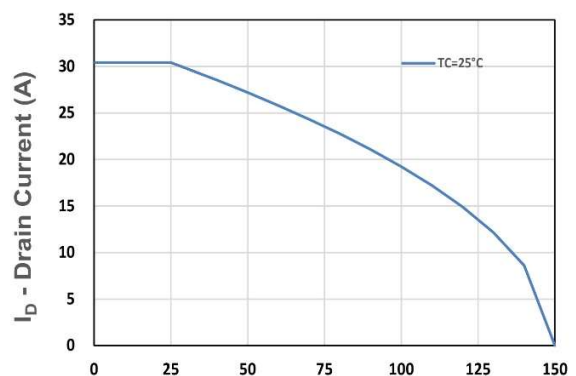
V_{DS} - Drain - Source Voltage (V)
Figure 7. Capacitance



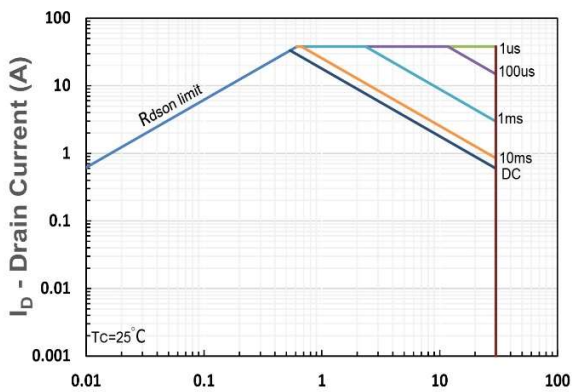
Q_g , Total Gate Charge (nC)
Figure 8. Gate Charge Characteristics



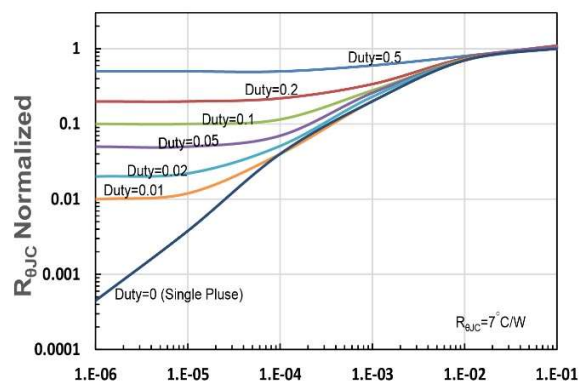
T_j - Junction Temperature (°C)
Figure 9. Power Dissipation



T_j - Junction Temperature (°C)
Figure 10. Drain Current



V_{DS} - Drain-Source Voltage (V)
Figure 11. Safe Operating Area



t_1 , Square Wave Pulse Duration(s)
Figure 12. $R_{\theta JC}$ Transient Thermal Impedance