





Power MOSFETS


DATASHEET

LM30060DAK8A

Dual N-Channel
Enhancement Mode MOSFET

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Quality Management Systems

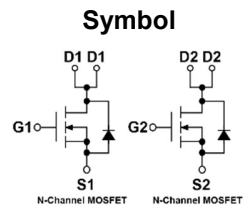
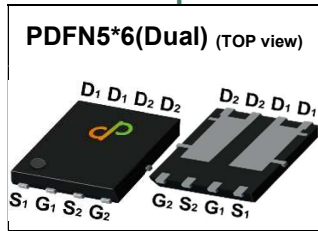
ISO 9001:2015 Certificate

LM30060DAK8A



Dual N-Channel Enhancement Mode MOSFET

Pin Description



Product Summary

Symbol	Dual N-Channel	Unit
V_{DSS}	30	V
$R_{DS(ON)-Max}$	5	m Ω
I_D	44	A

Feature

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

Applications

- Portable Equipment
- Battery Powered System

Ordering Information

Orderable Part Number	Package Type	Form	Shipping	Marking
LM30060DAK8A	PDFN5*6(Dual)	Tape & Reel	5000 / Tape & Reel	30060 □□□□□□

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}	Pulse Drain Current Tested	T _C =25°C 154	A
I_D	Continuous Drain Current	T _C =25°C 44 ^①	A
		T _C =100°C 39	
P_D	Maximum Power Dissipation	T _C =25°C 19.2	W
		T _C =100°C 7.7	
I_D	Continuous Drain Current	T _A =25°C 16.8	A
		T _A =70°C 13.4	
P_D	Maximum Power Dissipation	T _A =25°C 1.4	W
		T _A =70°C 0.9	
$I_{AS}^{②}$	Avalanche Current, Single pulse	L=0.1mH 31	A
		L=0.5mH 17	
$E_{AS}^{③}$	Avalanche Energy, Single pulse	L=0.1mH 48	mJ
		L=0.5mH 72	

Thermal Characteristics

Symbol	Parameter	Rating	Unit
$R_{\theta JC}$	Thermal Resistance-Junction to Case	Steady State	6.5 °C/W
$R_{\theta JA}^{③}$	Thermal Resistance-Junction to Ambient	Steady State	88 °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.

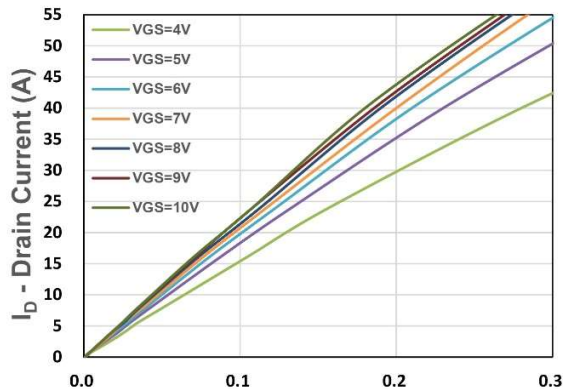
Dual N-Channel Electrical Characteristics (T_J=25°C Unless Otherwise Noted)

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	1.5	2	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} =16A	-	4.2	5	mΩ
		V _{GS} =4.5V, I _{DS} =12A	-	5.3	7	
g_{fs}	Forward Transconductance	V _{DS} =5V, I _{DS} =8A	-	20	-	S
Dynamic Characteristics ^⑤						
R_G	Gate Resistance	V _{GS} =0V, V _{DS} =0V, Freq.=1MHz	-	1	-	Ω
C_{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =15V, Freq.=1MHz	-	2440	-	pF
C_{oss}	Output Capacitance		-	300	-	
C_{rss}	Reverse Transfer Capacitance		-	255	-	
t_{d(ON)}	Turn-on Delay Time	V _{GS} =10V, V _{DS} =15V, I _D =1A, R _{GEN} =6Ω	-	10.1	-	nS
t_r	Turn-on Rise Time		-	17.4	-	
t_{d(OFF)}	Turn-off Delay Time		-	43.3	-	
t_f	Turn-off Fall Time		-	31.8	-	
Q_g	Total Gate Charge	V _{GS} =4.5V, V _{DS} =15V, I _D =20A	-	33.1	-	nC
Q_g	Total Gate Charge	V _{GS} =10V, V _{DS} =15V, I _D =20A	-	62	-	
Q_{gs}	Gate-Source Charge		-	10.21	-	
Q_{gd}	Gate-Drain Charge		-	16	-	
Source-Drain Characteristics						
V_{SD} ^④	Diode Forward Voltage	I _{SD} =8A, V _{GS} =0V	-	0.75	1.1	V
t_{rr}	Reverse Recovery Time	I _F =1A, V _R =0V	-	20	-	nS
Q_{rr}	Reverse Recovery Charge	dI _F /dt=100A/μs	-	12	-	nC

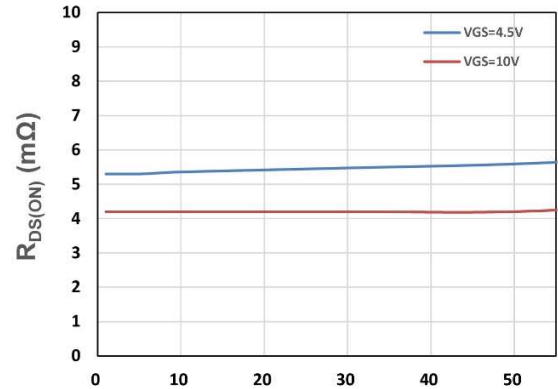
Note ④ : Pulse test (pulse width≤300us, duty cycle≤2%).

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

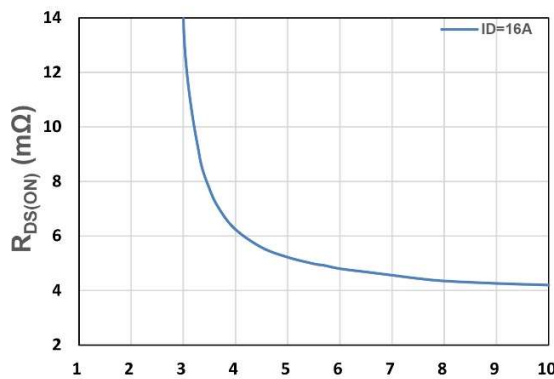
Dual N-Channel Typical Characteristics



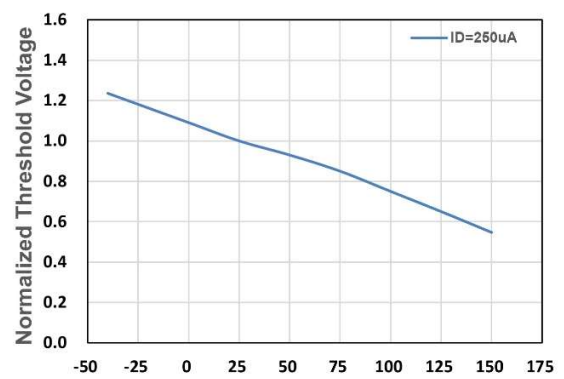
V_{DS} - Drain - Source Voltage (V)
Figure 1. Output Characteristics



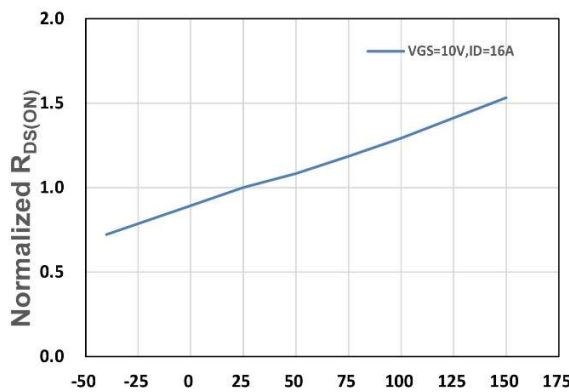
I_D - Drain Current (A)
Figure 2. On-Resistance vs. ID



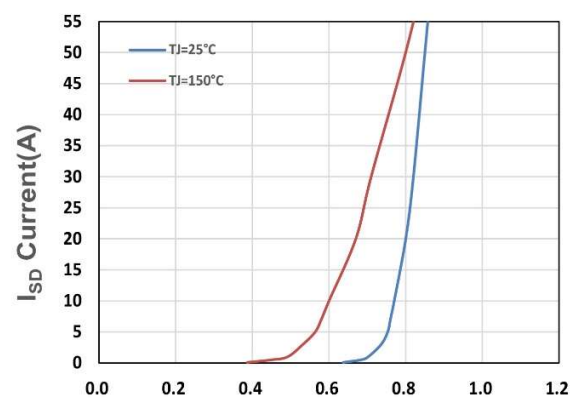
V_{GS} - Gate - Source Voltage (V)
Figure 3. On-Resistance vs. VGS



T_j , Junction Temperature(°C)
Figure 4. Gate Threshold Voltage

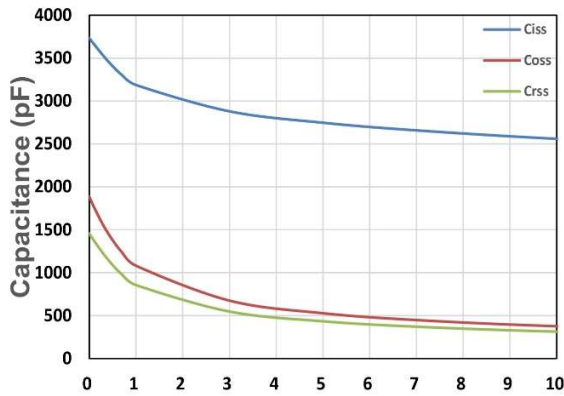


T_j , Junction Temperature(°C)
Figure 5. Drain-Source On Resistance

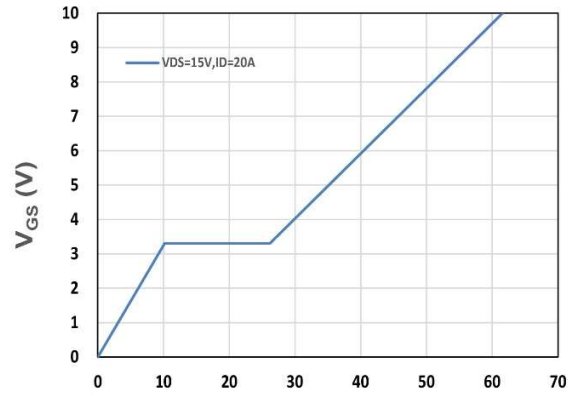


V_{SD} , Source-Drain Voltage(V)
Figure 6. Source-Drain Diode Forward

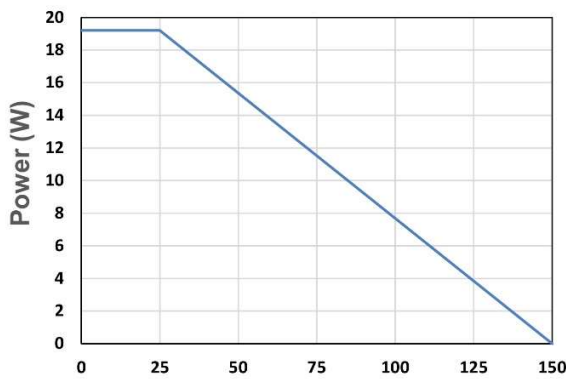
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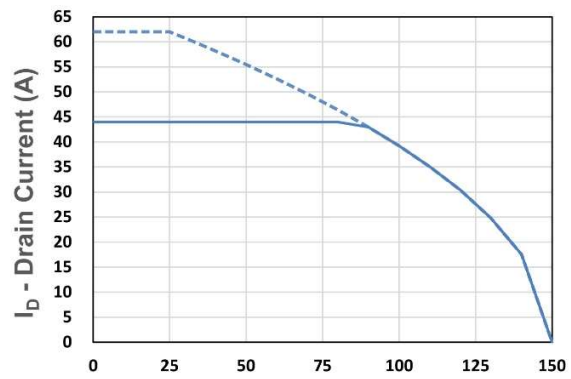
V_{DS} - Drain - Source Voltage (V)
Figure 7. Capacitance



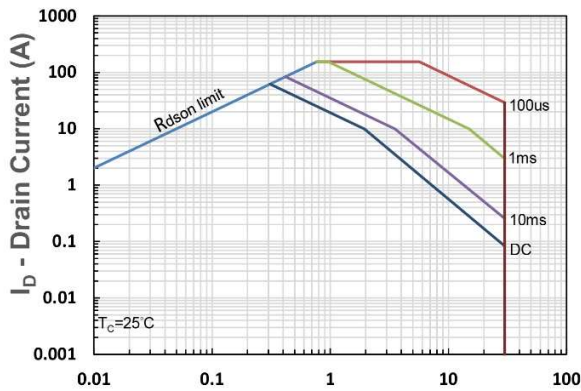
Q_g , Total Gate Charge (nC)
Figure 8. Gate Charge Characteristics



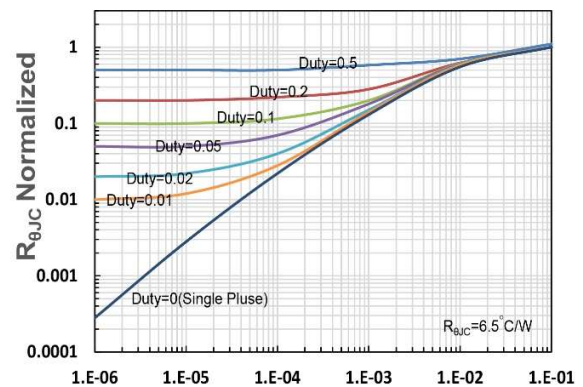
T_C - Case Temperature (°C)
Figure 9. Power Dissipation



T_C - Case 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