



Power MOSFETS

DATASHEET

LM25006NAM8A

N-Channel
Enhancement Mode MOSFET



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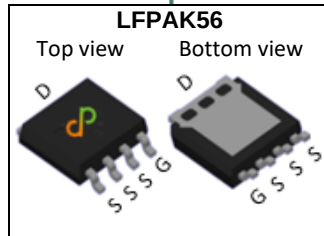


Quality Management Systems

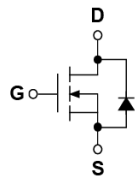
ISO 9001:2015 Certificate

N-Channel Enhancement Mode MOSFET

Pin Description



Symbol



Product Summary

Symbol	N-Channel	Unit
V_{DS}	25	V
$R_{DS(ON)-Max}$	0.57	m Ω
ID	400	A

Feature

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

Applications

- Power Load Switch
- Oring FETs

Ordering Information

Orderable Part Number	Package Type	Form	Shipping	Marking
LM25006NAM8A	LFPK56	Tape & Reel	4000 / Tape & Reel	25006 □□□□□□

Note: □□□□□□ = Lot code

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

Symbol	Parameter	N-Channel	Unit
V_{DS}	Drain-Source Voltage	25	V
V_{GS}	Gate-Source Voltage	±16	
T_J	Maximum Junction Temperature	175	°C
T_{STG}	Storage Temperature Range	-55 to 175	°C
I_S	Diode Continuous Forward Current	$T_C=25^\circ\text{C}$ 57	A
$I_{DM}^{(1)}$	Pulse Drain Current Tested	$T_C=25^\circ\text{C}$ 1023	A
I_D	Continuous Drain Current	$T_C=25^\circ\text{C}$ 400 $T_C=100^\circ\text{C}$ 289	A
P_D	Maximum Power Dissipation	$T_C=25^\circ\text{C}$ 125 $T_C=100^\circ\text{C}$ 63	W
$I_D^{(2)}$	Continuous Drain Current	$T_A=25^\circ\text{C}$ 67 $T_A=70^\circ\text{C}$ 56	A
$P_D^{(2)}$	Maximum Power Dissipation	$T_A=25^\circ\text{C}$ 3.2 $T_A=70^\circ\text{C}$ 2.3	W
$I_{AS}^{(3)}$	Avalanche Current, Single pulse	$L=0.1\text{mH}$ 86	A
$E_{AS}^{(3)}$	Avalanche Energy, Single pulse	$L=0.1\text{mH}$ 369	mJ
$I_{AS}^{(3)}$	Avalanche Current, Single pulse	$L=0.5\text{mH}$ 49	A
$E_{AS}^{(3)}$	Avalanche Energy, Single pulse	$L=0.5\text{mH}$ 597	mJ

Thermal Characteristics

Symbol	Parameter	Rating	Unit
$R_{\theta JC}$	Thermal Resistance-Junction to Case	Steady State 1.2	°C/W
$R_{\theta JA}^{(2)}$	Thermal Resistance-Junction to Ambient	Steady State 45	°C/W

Note ① : Max. current is limited by junction temperature.

Note ② : Surface Mounted on 1in² FR-4 board with 1oz.

Note ③ : UIS tested and pulse width are limited by maximum junction temperature 175°C.

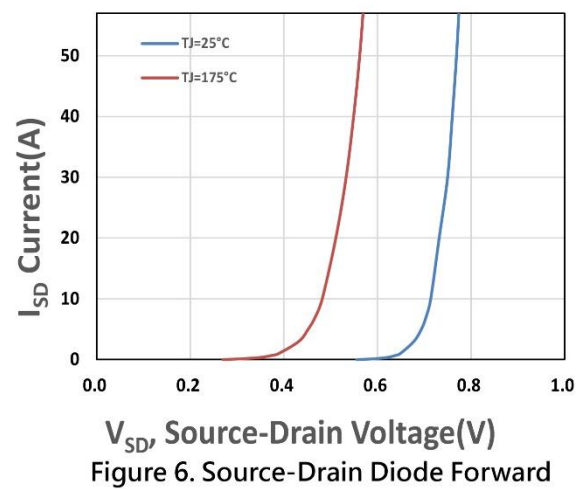
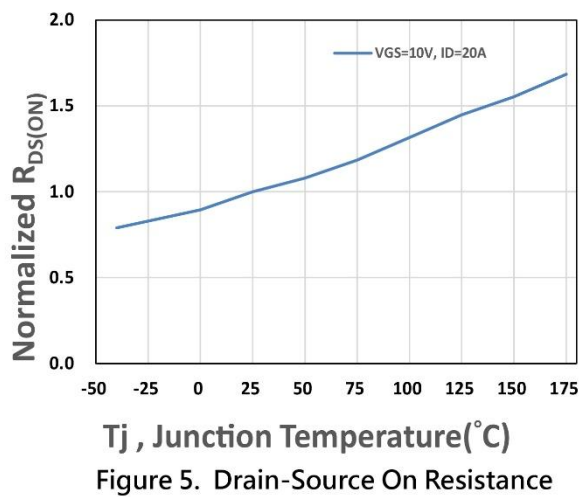
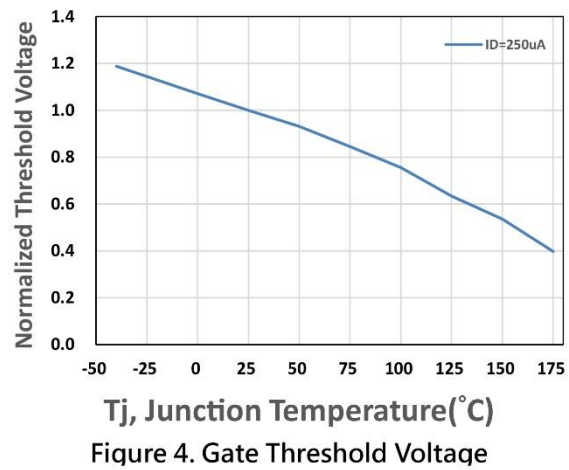
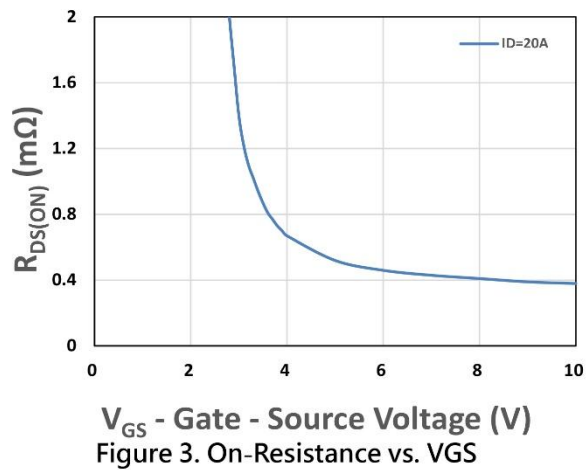
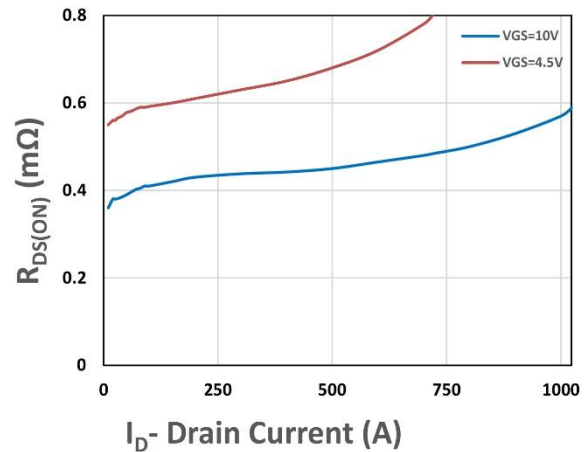
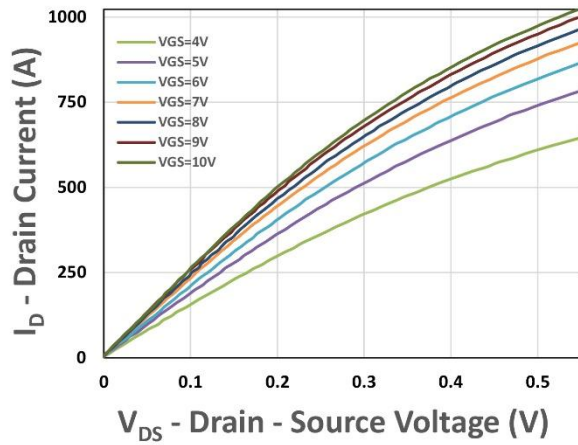
N-Channel Electrical Characteristics ($T_J=25^{\circ}\text{C}$ Unless Otherwise Noted)

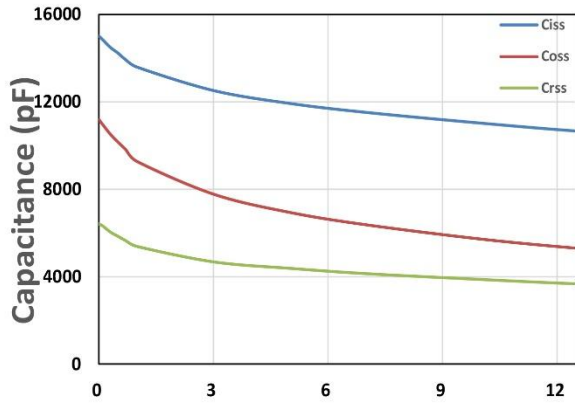
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
Static Electrical Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _{DS} =250uA	25	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =20V, V _{GS} =0V	-	-	1	uA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _{DS} =250uA	1	1.4	1.9	V
I _{GSS}	Gate Leakage Current	V _{GS} =±16V, V _{DS} =0V	-	-	±100	nA
R _{DS(ON)} ④	Drain-Source On-state Resistance	V _{GS} =10V, I _{DS} =20A	-	0.38	0.57	mΩ
		V _{GS} =4.5V, I _{DS} =10A	-	0.57	0.81	
gfs	Forward Transconductance	V _{DS} =5V, I _{DS} =10A	-	71	-	S
Dynamic Characteristics ⑥						
R _G	Gate Resistance	V _{GS} =0V, V _{DS} =0V, Freq.=1MHz	-	1.3	-	Ω
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =12.5V, Freq.=1MHz	-	10670	-	pF
C _{oss}	Output Capacitance		-	5305	-	
C _{rss}	Reverse Transfer Capacitance		-	3682	-	
td(ON)	Turn-on Delay Time	V _{GS} =10V, V _{DS} =12.5V, I _D =1A, R _{GEN} =1Ω	-	18	-	nS
tr	Turn-on Rise Time		-	27	-	
td(OFF)	Turn-off Delay Time		-	97	-	
tf	Turn-off Fall Time		-	74	-	
Qg	Total Gate Charge	V _{GS} =4.5V, V _{DS} =12.5V I _D =20A	-	151	-	nC
Qg	Total Gate Charge	V _{GS} =10V, V _{DS} =12.5V, I _D =20A	-	248	-	
Qgs	Gate-Source Charge		-	23	-	
Qgd	Gate-Drain Charge		-	88	-	
Source-Drain Characteristics						
VSD ④	Diode Forward Voltage	ISD=10A, VGS=0V	-	0.69	1.1	V
trr	Reverse Recovery Time	IF=10A, VR=12.5V	-	82	-	nS
Qrr	Reverse Recovery Charge	dIF/dt=100A/μs	-	62	-	nC

Note ④ : Pulse test (pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$).

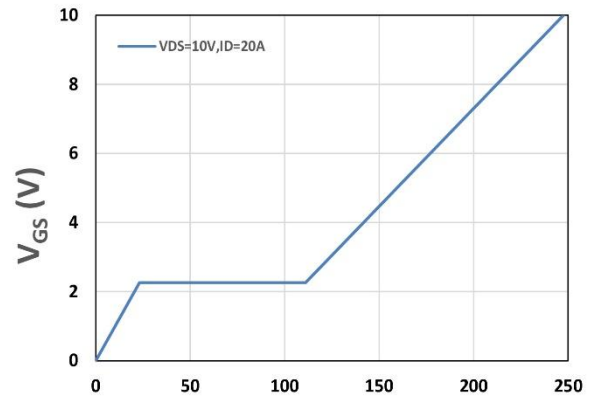
Note ⑤ : Guaranteed by design, not subject to production testing.

N-Channel Typical Characteristics

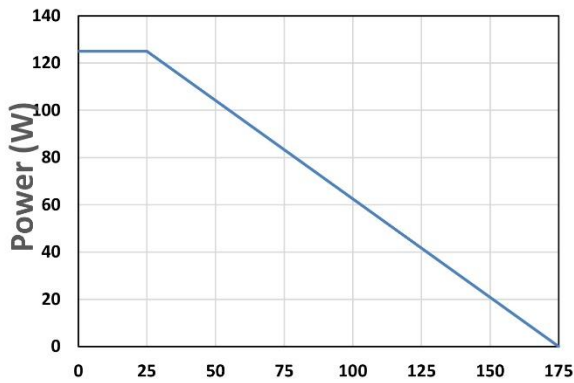




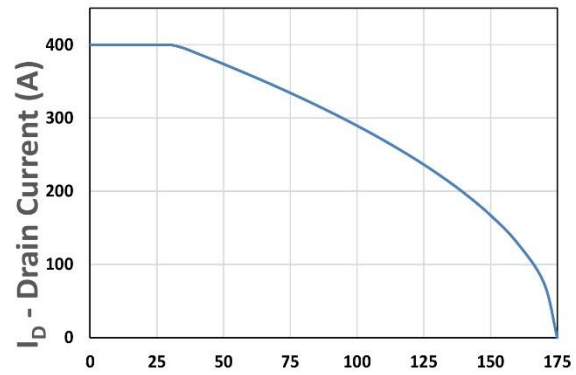
V_{DS} - Drain - Source Voltage (V)
Figure 7. Capacitance



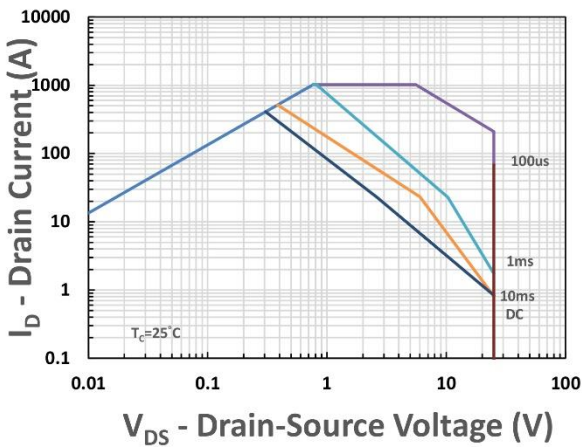
Q_g , Total Gate Charge (nC)
Figure 8. Gate Charge Characteristics



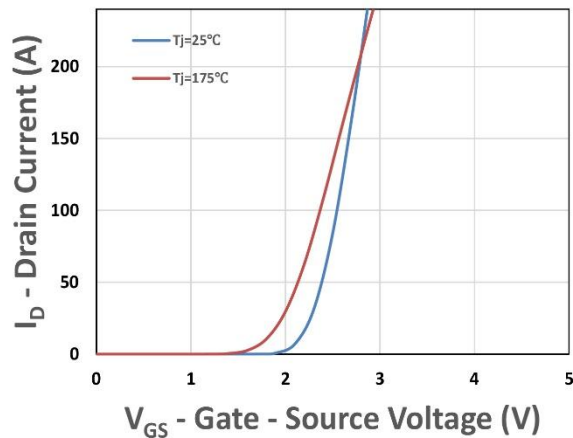
T_c -Case Temperature (°C)
Figure 9. Power Dissipation



T_c -Case Temperature (°C)
Figure 10. Drain Current



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



V_{GS} - Gate - Source Voltage (V)
Figure 12. Transfer Characteristics

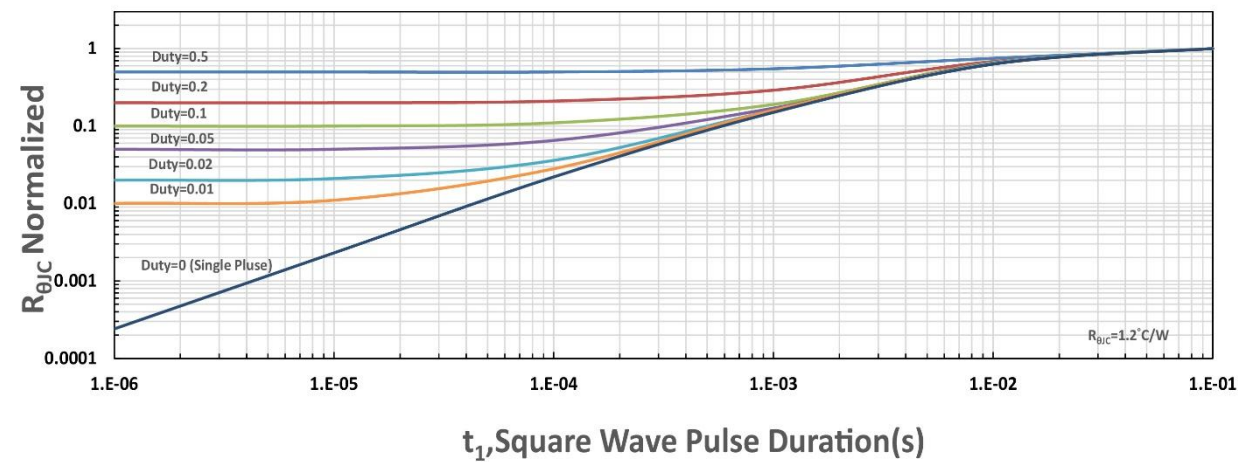


Figure 13. $R_{\theta JC}$ Transient Thermal Impedance