



Power MOSFETS

DATASHEET

LM30145PAK8A

P-Channel
Enhancement Mode MOSFET

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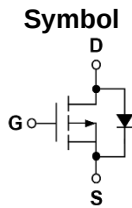
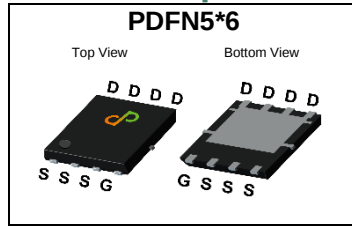


Quality Management Systems

ISO 9001:2015 Certificate

P-Channel Enhancement Mode MOSFET

Pin Description



Ordering Information

Symbol	P-Channel	Unit
V_{DS}	-30	V
$R_{DS(ON)-Max}$	14.5	mΩ
I_D	-43	A

Feature

- Reliable and Rugged
- ROHS Compliant & Halogen-Free
- Lower Qg and Qgd for high-speed switching
- Lower $R_{DS(ON)}$ to Minimize Conduction Losses
- 100% UIS Tested

Applications

- Power Management in DC/DC
- Power Load Switch

Ordering Information

Orderable Part Number	Package Type	Form	Shipping	Marking
LM30145PAK8A	PDFN5*6	Tape & Reel	5000 / Tape & Reel	30145 □□□□□□

Note : □□□□□□ = Lot Code

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

Symbol	Parameter		P-Channel	Unit
V_{DS}	Drain-Source Voltage		-30	V
V_{GS}	Gate-Source Voltage		±25	
T_J	Maximum Junction Temperature		150	°C
T_{STG}	Storage Temperature Range		-55 to 150	°C
$I_{DM}^{①}$	Pulse Drain Current Tested	$T_c=25^\circ\text{C}$	-70	A
$I_D^{③}$	Continuous Drain Current	$T_c=25^\circ\text{C}$	-43	A
		$T_c=100^\circ\text{C}$	-27	
$P_D^{③}$	Maximum Power Dissipation	$T_c=25^\circ\text{C}$	42	W
		$T_c=100^\circ\text{C}$	17	
$I_{AS}^{③}$	Avalanche Current, Single pulse	$L=0.1\text{mH}$	-26	A
$E_{AS}^{②}$	Avalanche Energy, Single pulse	$L=0.1\text{mH}$	34	mJ

Thermal Characteristics

Symbol	Parameter		Rating	Unit
$R_{\theta JC}$	Thermal Resistance-Junction to Case	Steady State	3	°C/W
$R_{\theta JA}^{③}$	Thermal Resistance-Junction to Ambient	Steady State	50	°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.

P-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} =±25V, V _{DS} =0V	-	-	±100	nA
R _{DS(ON)} ④	Drain-Source On-state Resistance	V _{GS} =-10V, I _{DS} =-10A	-	12	14.5	mΩ
		V _{GS} =-4.5V, I _{DS} =-7A	-	15.5	20	
gfs	Forward Transconductance	V _{DS} =-10V, I _{DS} =-5A	-	14.7	-	S
Dynamic Characteristics ⑥						
R _G	Gate Resistance	V _{GS} =0V,V _{DS} =0V, Freq.=1MHz	-	8.9	-	Ω
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =-15V, Freq.=1MHz	-	2157	-	pF
C _{oss}	Output Capacitance		-	235	-	
C _{rss}	Reverse Transfer Capacitance		-	206	-	
td(ON)	Turn-on Delay Time	V _{GS} =-10V,V _{DS} =-15V, I _D =-20A,R _{GEN} =3.3Ω	-	10.6	-	nS
tr	Turn-on Rise Time		-	15.6	-	
td(OFF)	Turn-off Delay Time		-	90	-	
tf	Turn-off Fall Time		-	31.2	-	
Qg	Total Gate Charge	V _{GS} =-4.5V,V _{DS} =-15V I _D =-20A	-	23	-	nC
Qg	Total Gate Charge	V _{GS} =-10V,V _{DS} =-15V, I _D =-20A	-	46	-	
Qgs	Gate-Source Charge		-	6.5	-	
Qgd	Gate-Drain Charge		-	8.8	-	
Source-Drain Characteristics						
VSD④	Diode Forward Voltage	ISD=-3A, VGS=0V	-	-0.75	-1.1	V
trr	Reverse Recovery Time	IF=-10A, VR=-15V,	-	13.4	-	nS
Qrr	Reverse Recovery Charge	dIF/dt=1A/μs	-	7.1	-	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

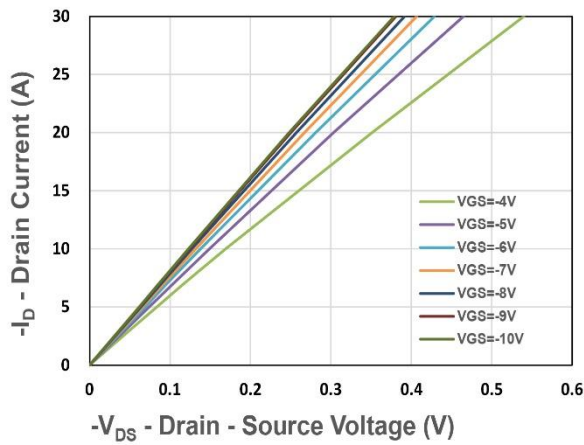


Figure 1. Output Characteristics

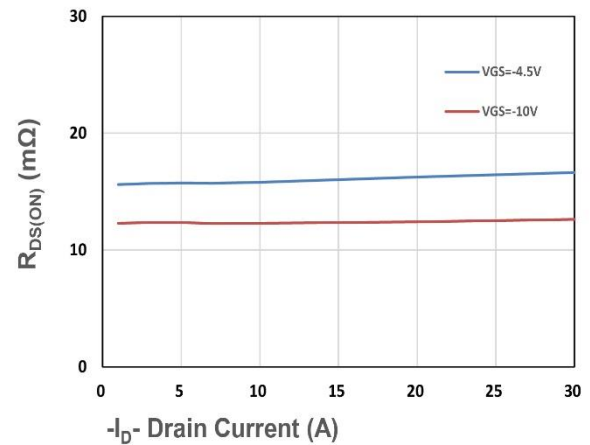


Figure 2. On-Resistance vs. I_D

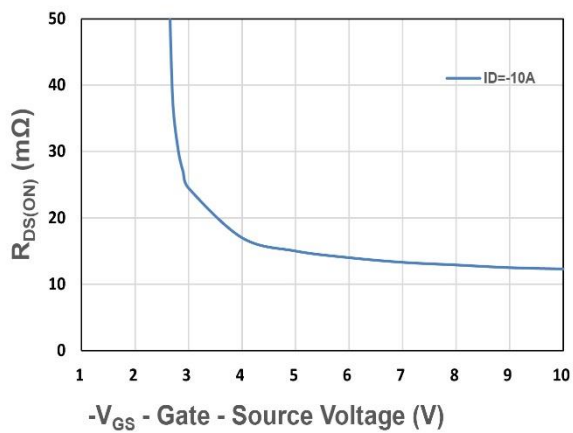


Figure 3. On-Resistance vs. V_{GS}

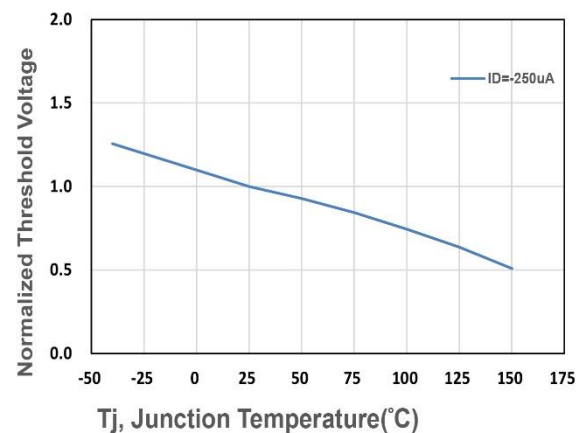


Figure 4. Gate Threshold Voltage

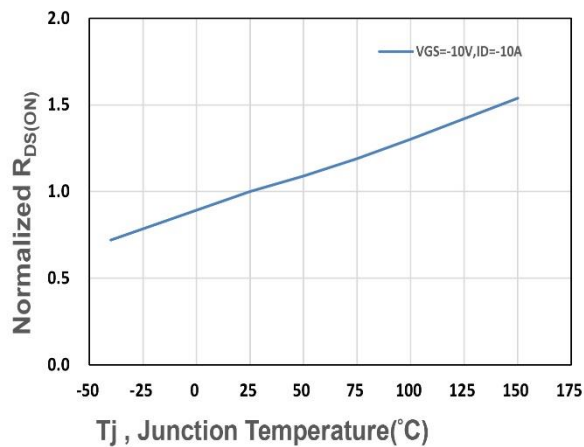


Figure 5. Drain-Source On Resistance

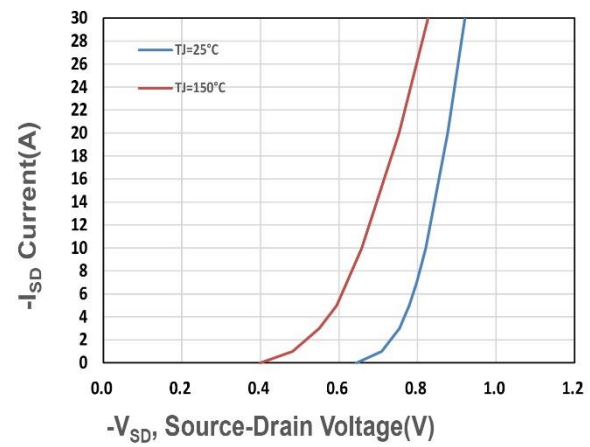
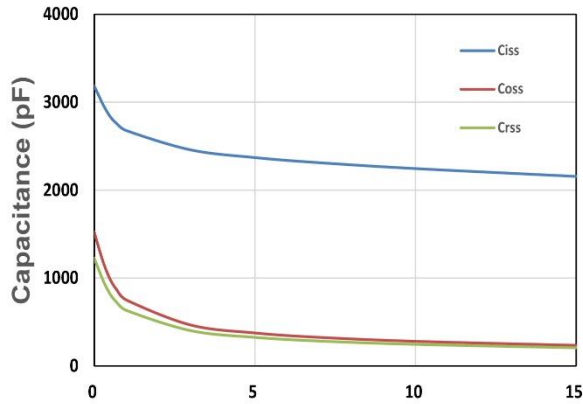
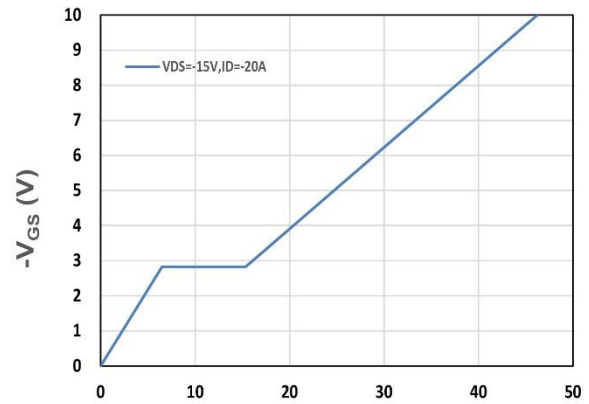


Figure 6. Source-Drain Diode Forward



$-V_{DS}$ - Drain - Source Voltage (V)

Figure 7. Capacitance



Q_g , Total Gate Charge (nC)

Figure 8. Gate Charge Characteristics

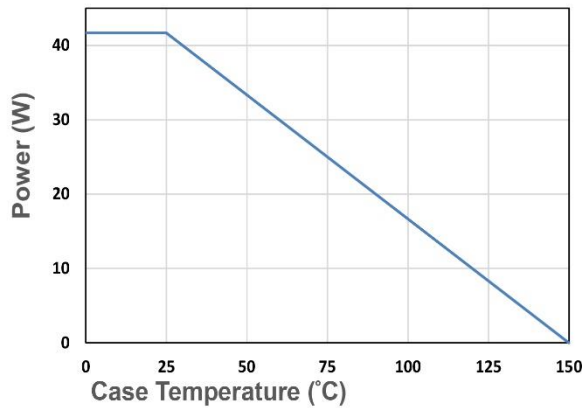


Figure 9. Power Dissipation

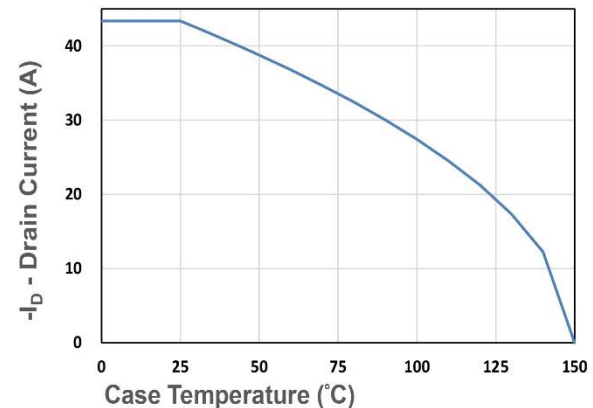
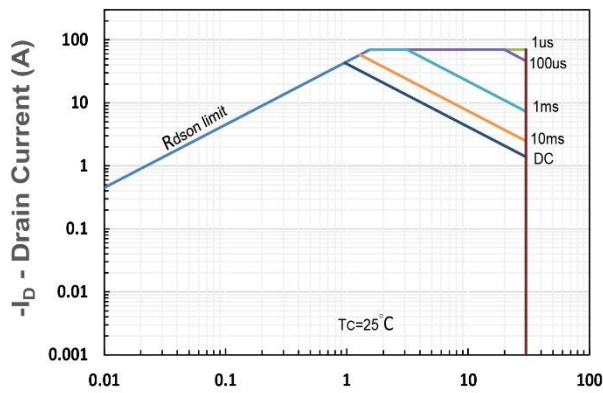
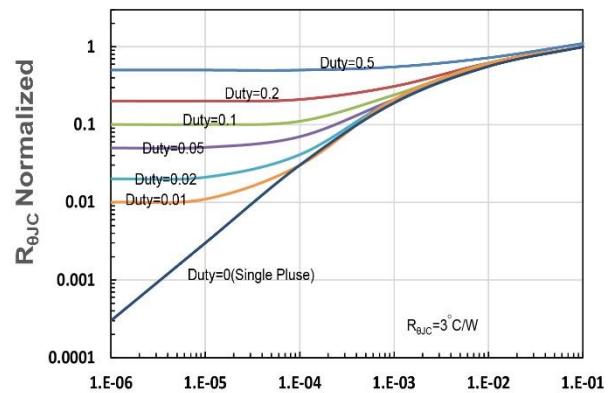


Figure 10. Drain Current



$-V_{DS}$ - Drain-Source Voltage (V)

Figure 11. Safe Operating Area



t_1 , Square Wave Pulse Duration(s)

Figure 12. $R_{\theta JC}$ Transient Thermal Impedance