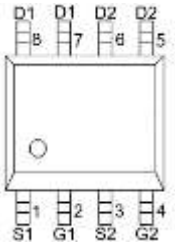
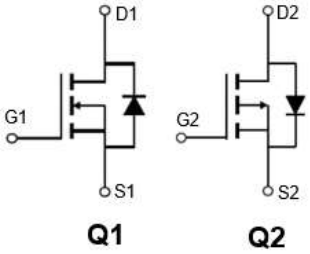
30V/-30V N and P-Channel Enhancement Mode MOSFET

Features

SOP8

- Q1: V_{DS}=30V;I_D=6.9A
- Q1: $R_{DS(ON)}$=19mΩ（TYP.）V_{GS}=10V,I_D=
- Q2: V_{DS}=-30V;I_D=-5.3A
- Q2: $R_{DS(ON)}$=45mΩ（TYP.）V_{GS}=-10V,I_D
- Reliable and Rugged
- High Current Capability
- Low On-Resistance





Applications

- Load Switch
- Power management in portable/desktop PCs
- DC/DC conversion

Ordering Information

Device	package	Device Marking	Package Qty.
LNP4606T1G	**SOP-8**	***	**3000/PCS**

Absolute Maximum Ratings (TA=25℃,unless otherwise noted)

Parameter	Symbol	Value(Q1)	Value(Q2)	Unit
Drain-Source Voltage (V_{GS}=0V)	V_{DS}	30	-30	V
Gate-Source Voltage (V_{GS}=0V,static)	V_{GS}	±20	±20	V
Continuous Drain Current (T_C=25℃)	I_D	6.9	-5.3	A
Pulesd Drain Current	I_{DM}	20	-20	A
Maximum Power Dissipation (T_C =25℃)	P_D	1.4	1.4	W
Operating,Storage Temperature Range	T_J,T_{STG}	-55~150	-55~150	℃

Q1:Electrical Characteristics

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V,I_D=250μA	30	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=40V, V_{GS}=0V	-	-	1	μA
Gate -Source Leakage Current	I_{GSS}	V_{GS}=±20V, V_{DS}=0V	-	-	±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}= V_{GS},I_D=250μA	1	1.5	3	V
Drain-Source On-stage Resistance	$R_{DS(ON)}$	V_{GS}=10V,I_D=1A	-	19	28	mΩ
		V_{GS}=4.5V,I_D=1A	-	28	42	

Thermal Characteristics

Parameter	Symbol	N-CH.	P-CH.	Unit
Thermal Resistance,Junction-to-Case	$R_{\theta JC}$	14	-	℃/ W
Thermal Resistance,Junction-to-Ambient	$R_{\theta JA}$	63	-	℃/ W

Dynamic Characteristics

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Input capacitance	C_{iss}	V_{DS}=20V	-	633	-	pF
Output capacitance	C_{oss}	V_{GS}=0V	-	65	-	
Reverse transfer capacitance	C_{rss}	f=1MHz	-	55	-	
Total Gate Charge	Q_g	V_{DS}=20V	-	10	-	nC
Gate Source Charge	Q_{gs}	V_{GS}=10V	-	3.2	-	
Gate Drain Charge	Q_{gd}	I_D=6A	-	2	-	
Turn-on delay Time	$t_{d(on)}$	V_{GS}=10V	-	5	-	ns
Rise time	t_r	V_{DS}=20V	-	3	-	
Turn-off delay Time	$t_{d(off)}$	R_L=3.2Ω	-	16	-	
Fall time	t_f	R_G=3Ω	-	6	-	

Reverse Diode Characteristics

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Body Diode Forward Voltage	V_{SD}	V_{GS}=0V,I_{SD}=1A	-	0.7	1	V
Reverse Recovery Time	t_{rr}	V_{GS}=0V,I_{SD}=6A	-	10	-	ns
Reverse Recovery Charge	Q_{rr}	d_i/d_t=500A/μs	-	13	-	nC

Q1:Electrical Characteristics Diagrames

Figure 1. On-Regin Characteristics

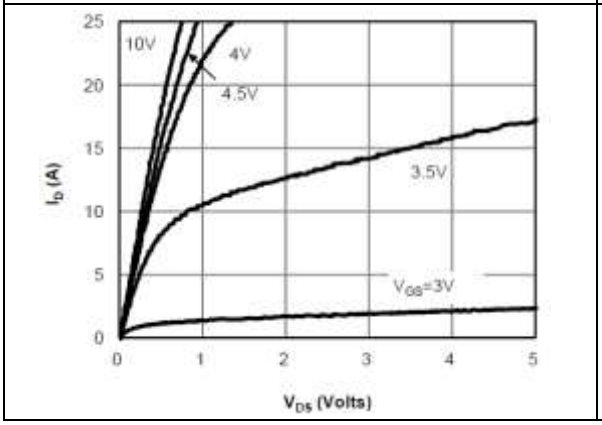


Figure 2. Transfer Characteristics

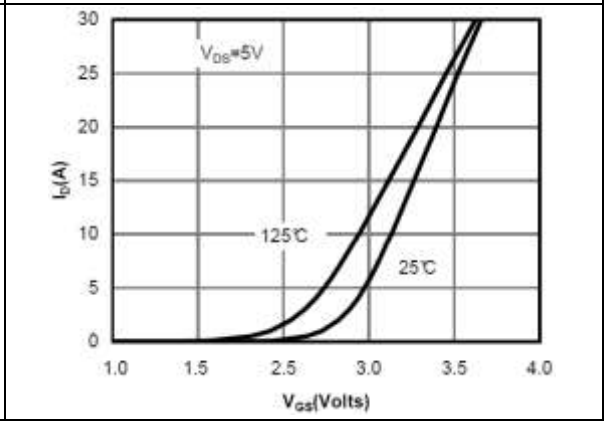


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

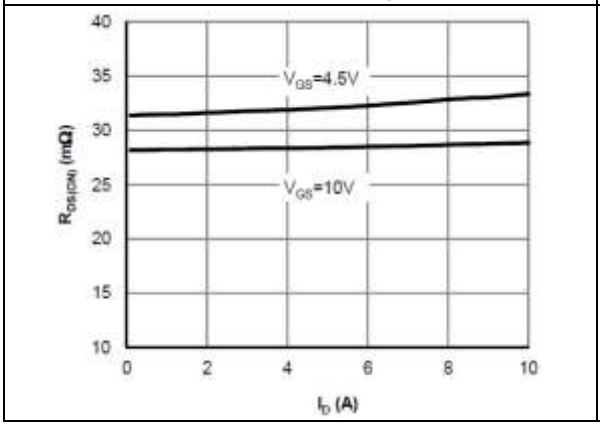


Figure 4. On-Resistance vs. Junction Temperature

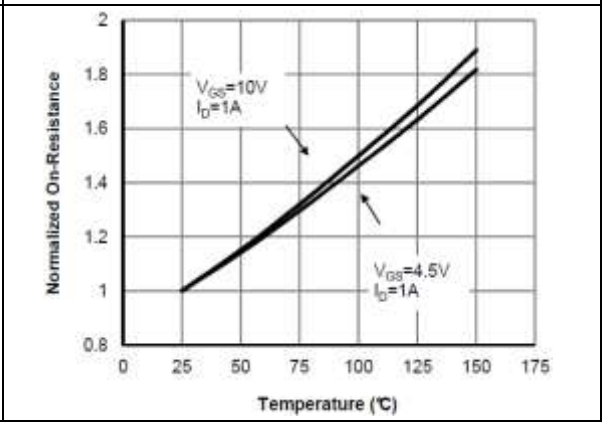


Figure 5. On-Resistance vs. Gate-Source Voltage

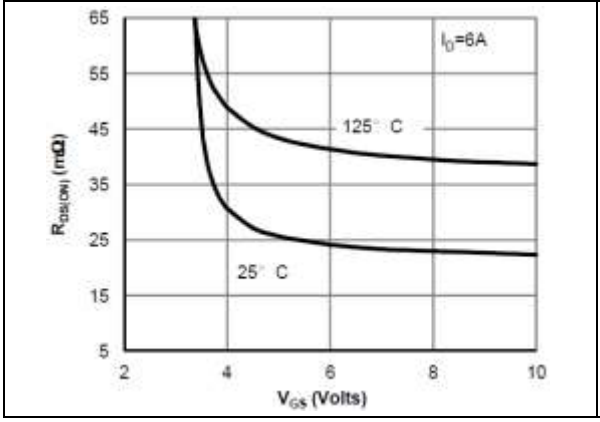
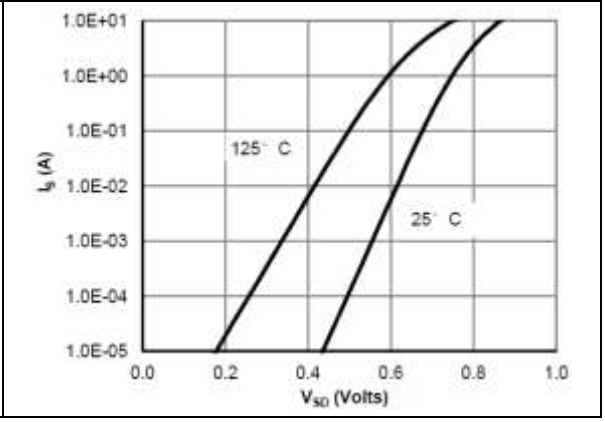


Figure 6. Body-Diode Characteristics



Q2:Electrical Characteristics

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V,I_D=-250μA	-30	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=-40V, V_{GS}=0V	-	-	-1	μA
Gate -Source Leakage Current	I_{GSS}	V_{GS}=±20V, V_{DS}=0V	-	-	±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}= V_{GS},I_D=-250μA	-1	-1.5	-3	V
Drain-Source On-stage Resistance	$R_{DS(ON)}$	V_{GS}=-10V,I_D=-1A	-	45	59	mΩ
		V_{GS}=-4.5V,I_D=-1A	-	72	91	

Reverse Diode Characteristics

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Body Diode Forward Voltage	V_{SD}	V_{GS}=0V,I_{SD}=-1A	-	-0.7	-1.2	V
Reverse Recovery Time	t_{rr}	V_{GS}=0V,I_{SD}=-5A	-	22	-	ns
Reverse Recovery Charge	Q_{rr}	d_i/d_t=500A/μs	-	15	-	nC

Dynamic Characteristics

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Input capacitance	C_{iss}	V_{DS}=-20V	-	850	-	pF
Output capacitance	C_{oss}	V_{GS}=0V	-	101	-	
Reverse transfer capacitance	C_{rss}	f=1MHz	-	65	-	
Total Gate Charge	Q_g	V_{DS}=-20V	-	17	-	nC
Gate Source Charge	Q_{gs}	V_{GS}=-10V	-	3.5	-	
Gate Drain Charge	Q_{gd}	I_D=-5A	-	3	-	
Turn-on delay Time	$t_{d(on)}$	V_{GS}=-10V	-	6.5	-	ns
Rise time	t_r	V_{DS}=-20V	-	7.8	-	
Turn-off delay Time	$t_{d(off)}$	R_L=4Ω	-	45	-	
Fall time	t_f	R_G=3Ω	-	40	-	

Q2:Electrical Characteristics Diagrames

Figure 1. On-Regin Characteristics

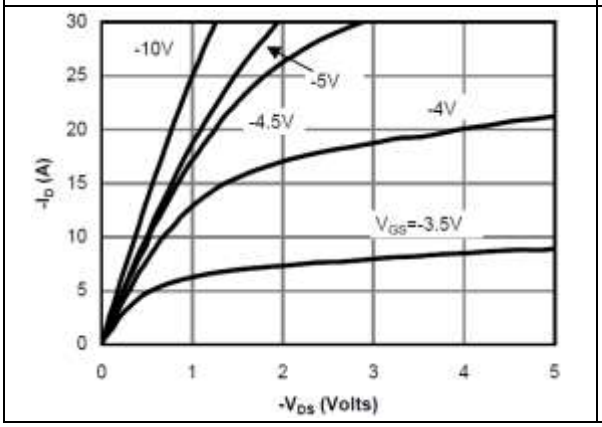


Figure 2. Transfer Characteristics

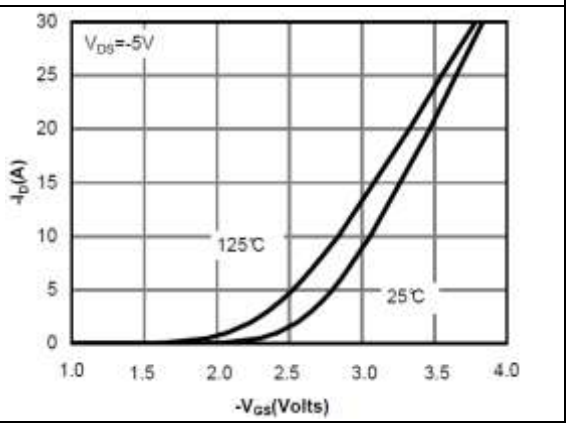


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

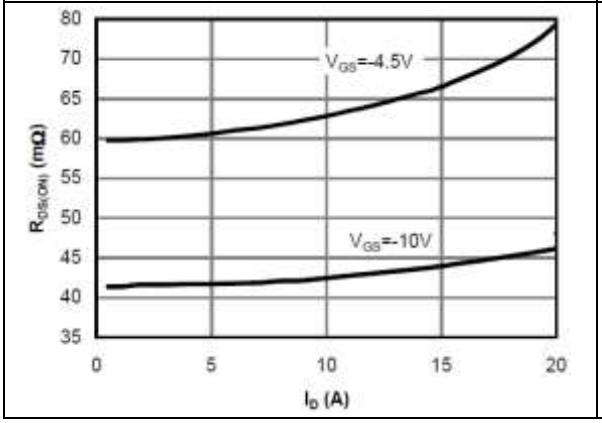


Figure 4. On-Resistance vs. Junction Temperature

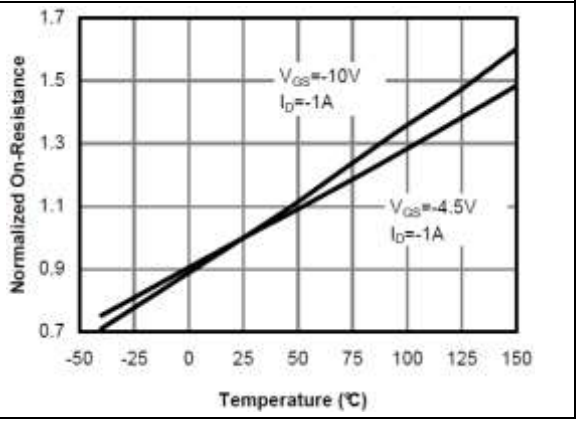
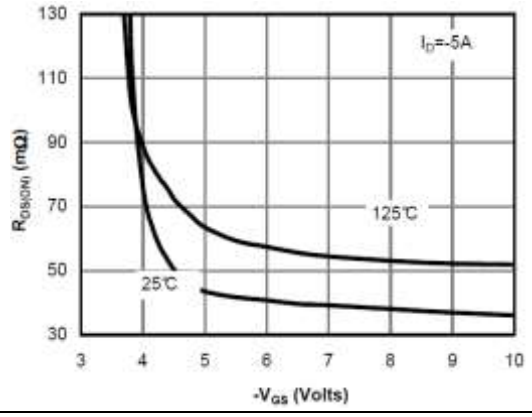
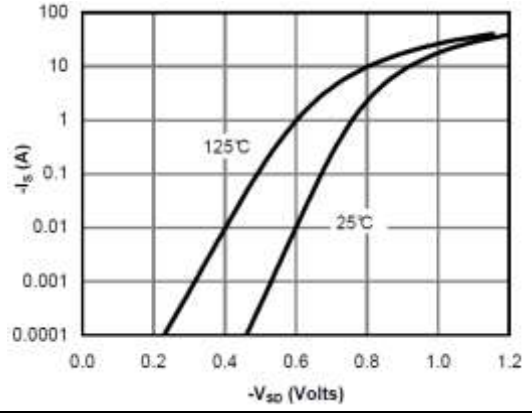
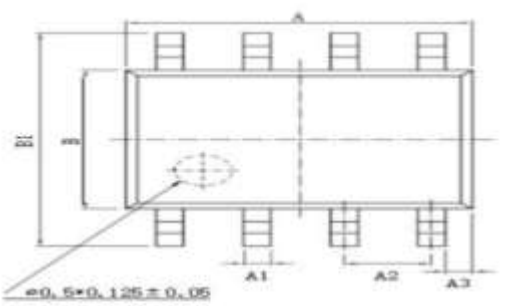
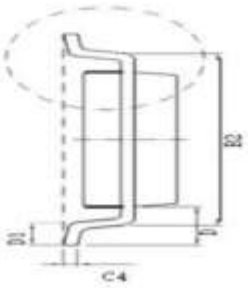


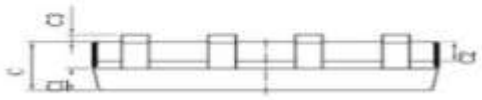
Figure 5. On-Resistance vs. Gate-Source Voltage	Figure 6. Body-Diode Characteristics

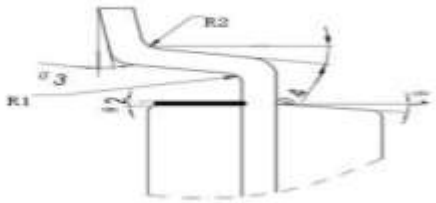












符号	尺寸（mm）		符号	尺寸（mm）	
	最小值	最大值		最小值	最大值
A	4.80	5.00	C3	0.05	0.20
A1	0.356	0.456	C4	0.203	0.233
A2	1.27 TYP		D	1.05 TYP	
A3	0.345 TYP		D1	0.40	0.80
B	3.80	4.00	R1	0.20 TYP	
B1	5.80	6.20	R2	0.20 TYP	
B2	5.00 TYP		θ1	17° TYP4	
C	1.30	1.60	θ2	13° TYP4	
C1	0.55	0.65	θ3	0° ~ 8°	
C2	0.55	0.65	θ4	4° ~ 12°	