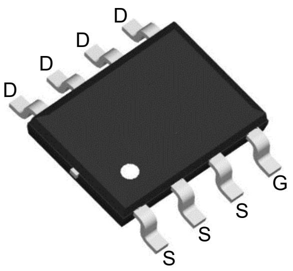
-60V_{DS}/±20V_{GS} P-Channel Advanced Mode MOSFET

Features

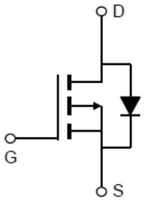
- V_{DS}=-60V,I_D=-7A
- $R_{DS(ON)}$=40mΩ（TYP.）V_{GS}=-10V
- $R_{DS(ON)}$=80mΩ（TYP.）V_{GS}=-4.5V
- Fast Switching
- Low On-Resistance

SOP8



Applications

- Switch switching
- Power management in portable/desktop PCs



Ordering Information

Device	package	Device Marking	Package Qty.
ZM230P06S	**SOP-8**	**230P06S**	**3000/PCS**

Absolute Maximum Ratings (T$_a$=25℃,unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage (V_{GS}=0V)	V_{DS}	-60	V
Gate-Source Voltage (V_{GS}=0V,static)	V_{GS}	±20	V
Continuous Drain Current (T$_a$=25℃)	I_D	-7	A
Continuous Drain Current (T$_a$=70℃)		-4	A
Pulesd Drain Current	I_{DM}	-80	A
Avalanche Energy, Single Pulsed	E_{AS}	135	mJ
Maximum Power Dissipation (T$_a$=25℃)	P_D	3.1	W
Maximum Power Dissipation (T$_a$=70℃)		2	W
Operating,Storage Temperature Range	T_J,T_{STG}	-55~150	℃

Thermal Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit
Thermal Resistance,Junction-to-Case	$R_{\theta JC}$	-	75	-	℃/ W
Thermal Resistance,Junction-to-Ambient	$R_{\theta JA}$	-	24	-	℃/ W

Electrical Characteristics

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V,I_D=-250μA	-60	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=-30V, 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	-1.4	-1.9	-2.4	V
Drain-Source On-stage Resistance	$R_{DS(ON)}$	V_{GS}=-10V,I_D=-1A	-	30	50	mΩ
		V_{GS}=-4.5V,I_D=-1A	-	45	80	

Dynamic Characteristics

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Input capacitance	C_{iss}	V_{DS}=-15V V_{GS}=0V f=1MHz	-	2417	-	pF
Output capacitance	C_{oss}		-	179	-	
Reverse transfer capacitance	C_{rss}		-	120	-	
Gate Resistance	R_g	f=1MHz	-	2	-	Ω
Total Gate Charge	Q_g	V_{DS}=-15V V_{GS}=-10V I_D=-15A	-	46	-	nC
Gate Source Charge	Q_{gs}		-	15.5	-	
Gate Drain Charge	Q_{gd}		-	18	-	
Turn-on delay Time	$t_{d(on)}$	V_{GS}=-10V V_{DS}=-15V R_L=1Ω R_G=3Ω	-	14	-	ns
Rise time	t_r		-	16	-	
Turn-off delay Time	$t_{d(off)}$		-	74	-	
Fall time	t_f		-	37	-	

Reverse Diode Characteristics

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Body Diode Forward Voltage	V_{SD}	V_{GS}=0V,I_{SD}=-1A	-	-0.8	-1	V
Reverse Recovery Time	t_{rr}	V_{GS}=0V,I_{SD}=-15A d_i/d_t=100A/μs	-	37	-	ns
Reverse Recovery Charge	Q_{rr}		-	5.3	-	nC

Electrical Characteristics Diagrames

Figure 1. On-Regin Characteristics

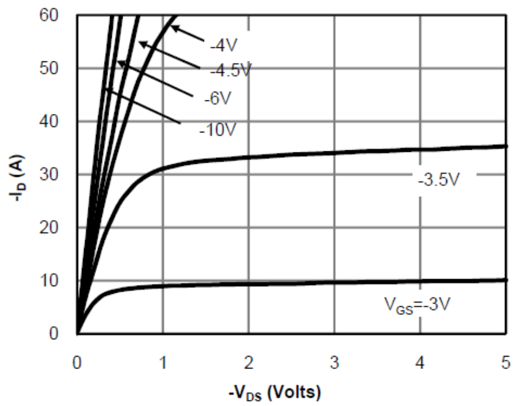


Figure 2. Transfer Characteristics

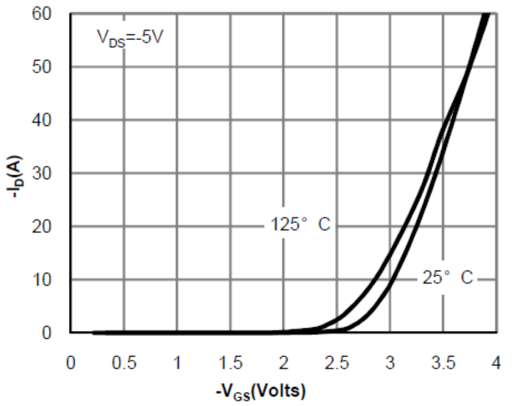


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

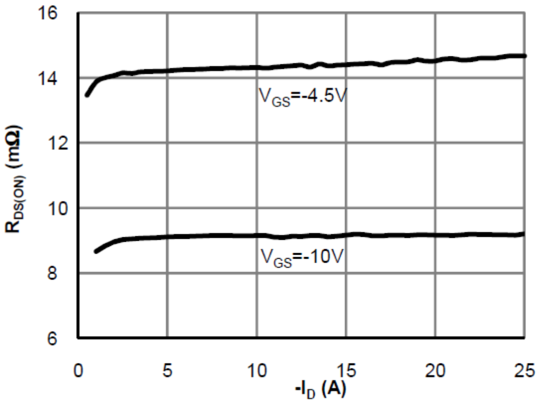


Figure 4. On-Resistance vs. Junction Temperature

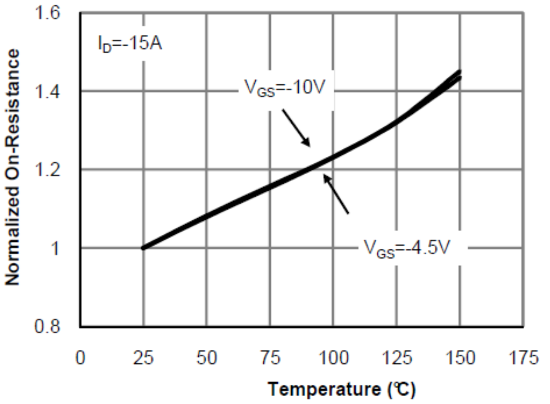


Figure 5. On-Resistance vs. Gate-Source Voltage

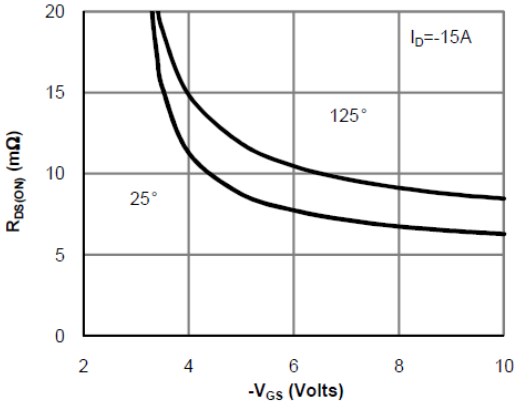


Figure 6. Body-Diode Characteristics

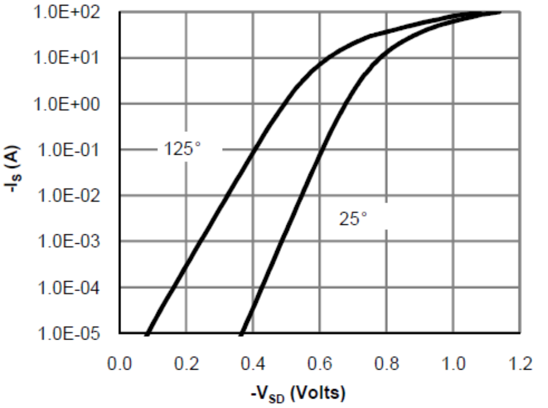


Figure 7. Gate-Charge Characteristics

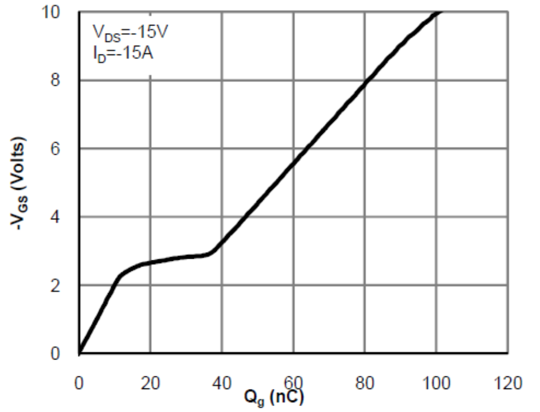


Figure 8. Capacitance Characteristics

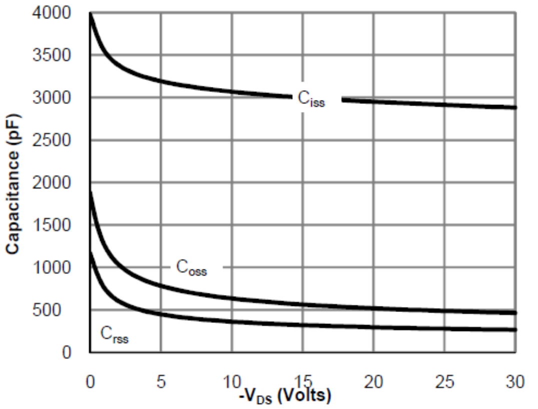


Figure 9. Maximum Forward Biased Safe Operating Area

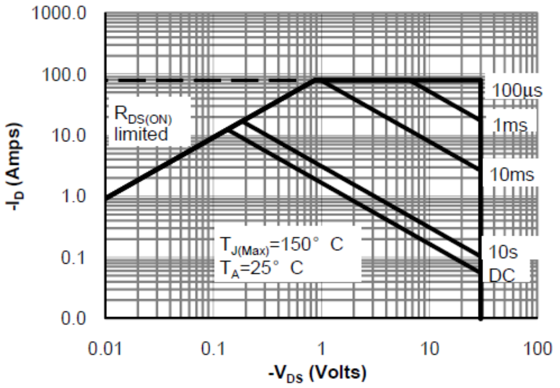


Figure 10. Single Pulse Power Rating Junction-to-Ambient

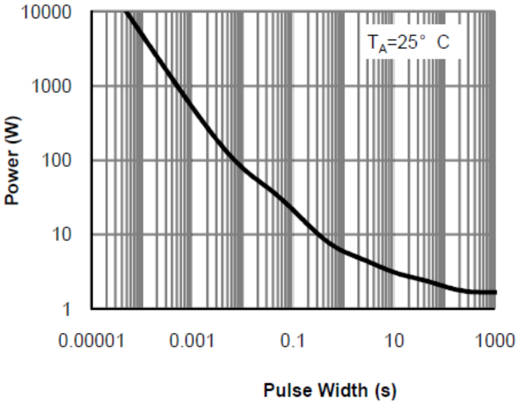
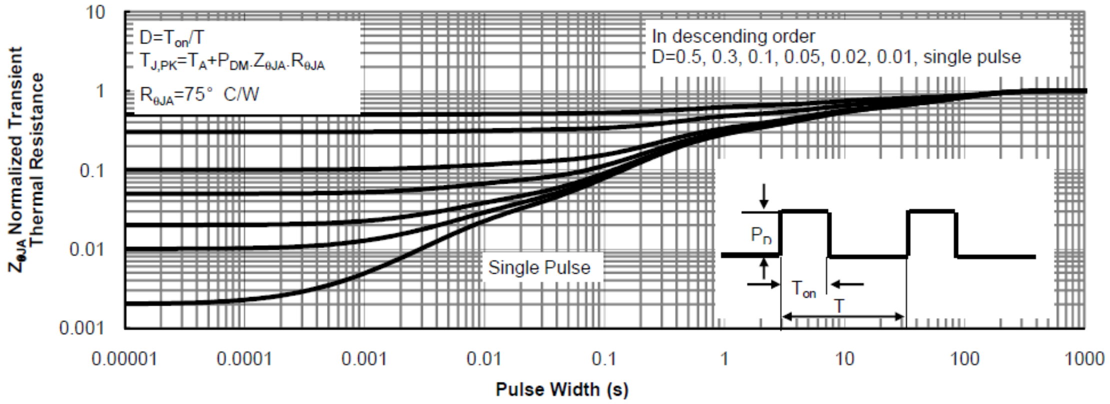
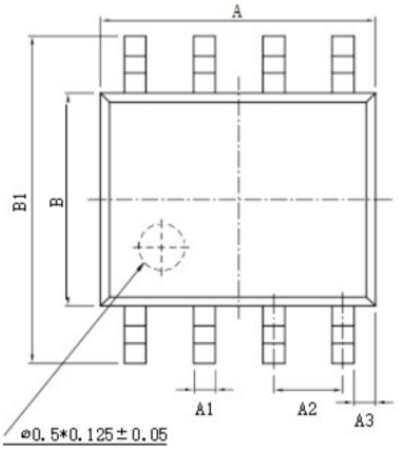


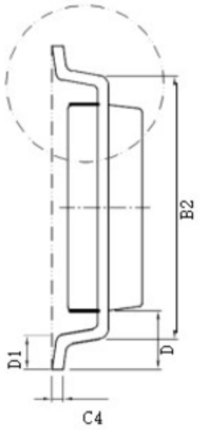
Figure 11. Normalized Maximum Transient Thermal Impedance

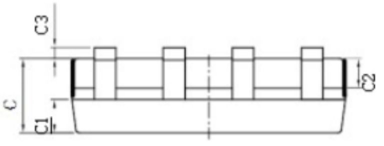


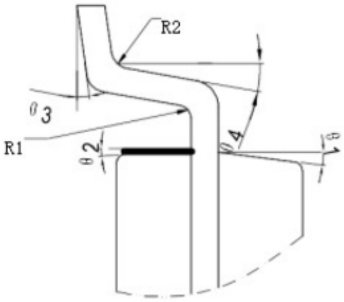
Physical Dimensions

SOP8









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°	