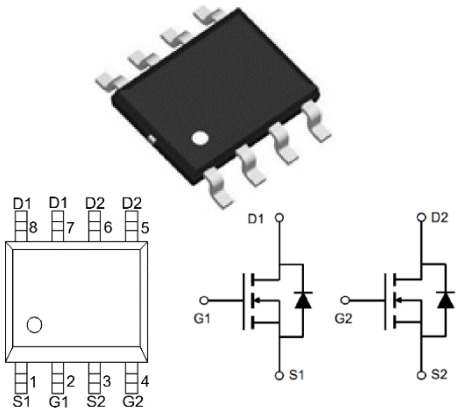
40V_{DS}/±20V_{GS} N-Channel Enhancement Mode MOSFET

Features

- V_{DS}=40V,I_D=7A
- $R_{DS(ON)}$=20mΩ（TYP.）V_{GS}=10V
- $R_{DS(ON)}$=30mΩ（TYP.）V_{GS}=4.5V
- Reliable and Rugged
- Avalanche Rated
- Low On-Resistance

SOP8



Applications

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

Ordering Information

Temperature Range	package		Orderable Device	Package Qty.
-55℃~+125℃	SOP8	Pb-Free	ZMD68405S	3000pcs/Reel

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

Parameter	Symbol	Value	Unit
Drain-Source Voltage (V_{GS}=0V)	V_{DS}	40	V
Gate-Source Voltage (V_{GS}=0V,static)	V_{GS}	±20	V
Continuous Drain Current (T_C=25℃)	I_D	7	A
Continuous Drain Current (T_C=100℃)		5.3	A
Pulesd Drain Current	I_{DM}	30	A
Single Pulsed Avalanche Energy	E_{AS}	66	mJ
Maximum Power Dissipation (T_C=25℃)	P_D	12	W
Maximum Power Dissipation (T_C=100℃)		5	W
Operating,Storage Temperature Range	T_J,T_{STG}	-55~150	℃

Thermal Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit
Thermal Resistance,Junction-to-Case	$R_{\theta JC}$	-	6.8	-	℃/ W
Thermal Resistance,Junction-to-Ambient	$R_{\theta JA}$	-	78	-	℃/ W

Electrical Characteristics

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V,I_D=250μA	40	-	-	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	1.2	1.5	2	V
Drain-Source On-stage Resistance	$R_{DS(ON)}$	V_{GS}=10V,I_D=1A	-	17	20	mΩ
		V_{GS}=4.5V,I_D=1A	-	19	30	

Dynamic Characteristics

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Input capacitance	C_{iss}	V_{DS}=15V	-	964	-	pF
Output capacitance	C_{oss}	V_{GS}=0V	-	109	-	
Reverse transfer capacitance	C_{rss}	f=1MHz	-	96	-	
Gate Resistance	R_g	f=1MHz	-	1.9	-	Ω
Total Gate Charge	Q_g	V_{DS}=15V	-	23	-	nC
Gate Source Charge	Q_{gs}	V_{GS}=10V	-	6.2	-	
Gate Drain Charge	Q_{gd}	I_D=20A	-	8.9	-	
Turn-on delay Time	$t_{d(on)}$	V_{GS}=10V	-	15	-	ns
Rise time	t_r	V_{DS}=15V	-	28	-	
Turn-off delay Time	$t_{d(off)}$	R_L=3.5Ω	-	68	-	
Fall time	t_f	R_G=6.8Ω	-	22	-	

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}=20A	-	17	-	ns
Reverse Recovery Charge	Q_{rr}	d_i/d_t=100A/μs	-	25	-	nC

Electrical Characteristics Diagrames

Figure 1. On-Regin Characteristics

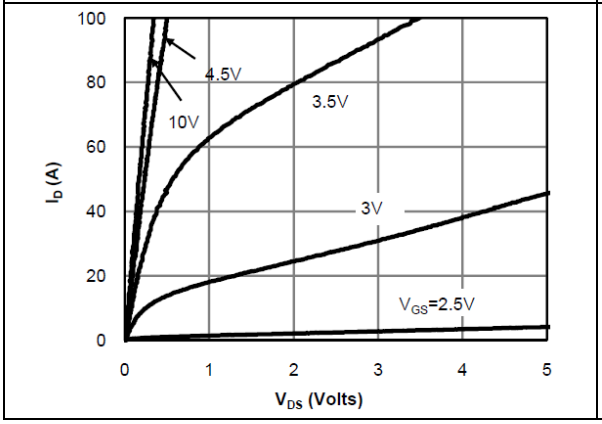


Figure 2. Transfer Characteristics

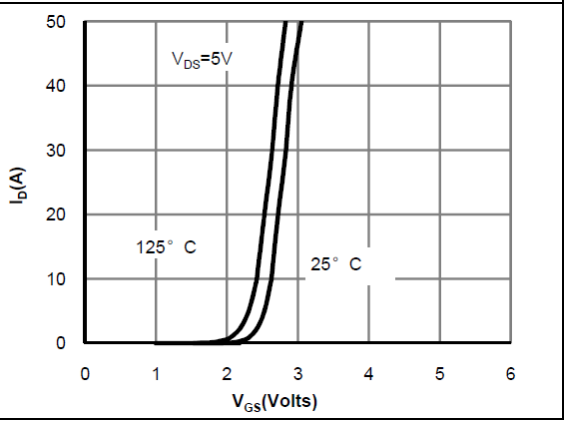


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

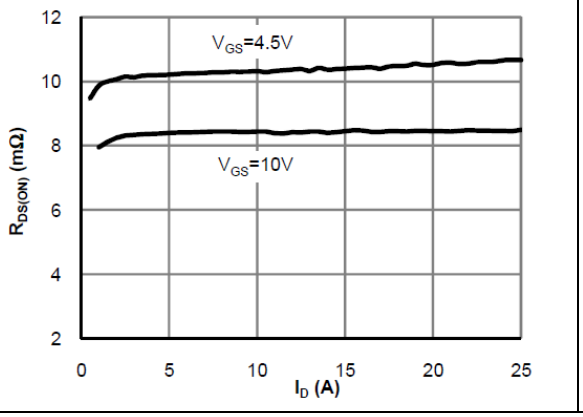


Figure 4. On-Resistance vs. Junction Temperature

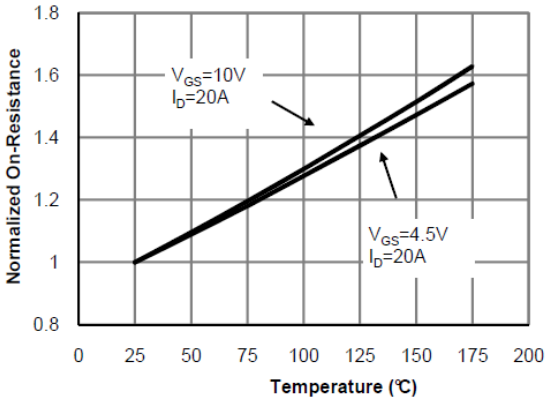


Figure 5. On-Resistance vs. Gate-Source Voltage

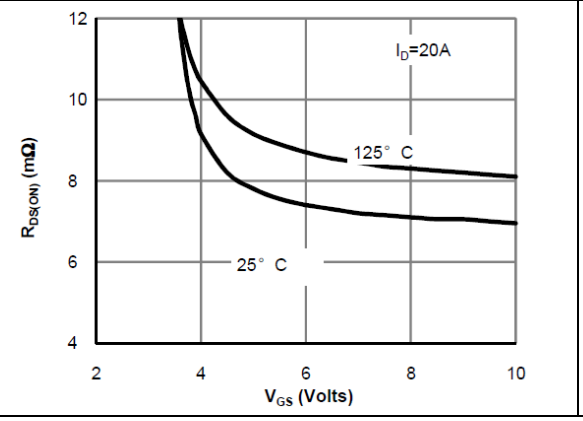


Figure 6. Body-Diode Characteristics

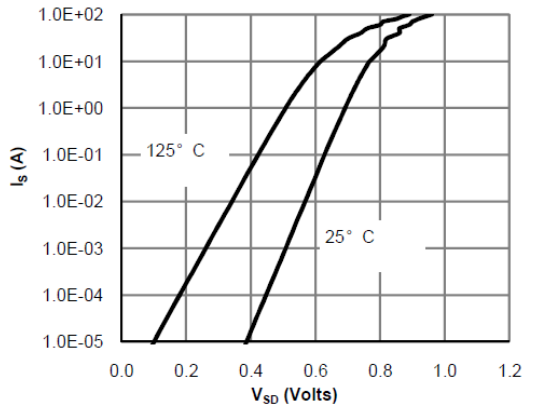


Figure 7. Gate-Charge Characteristics

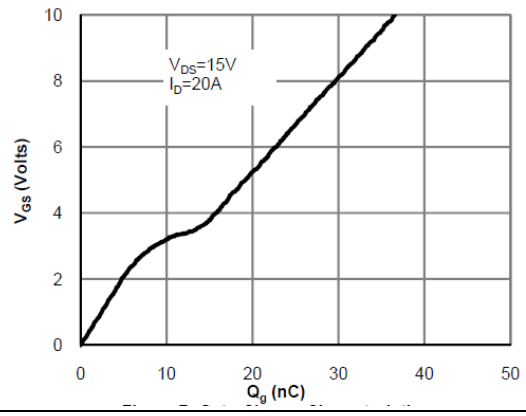


Figure 8. Capacitance Characteristics

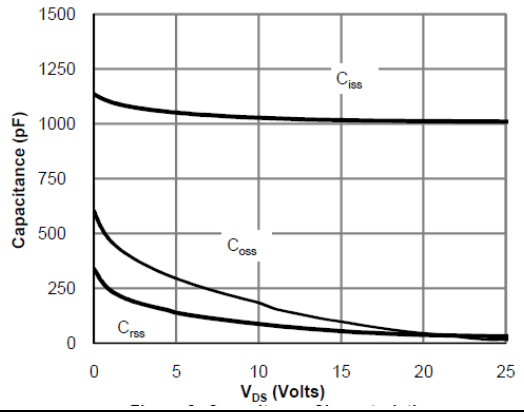


Figure 9. Maximum Forward Biased Safe Operating Area

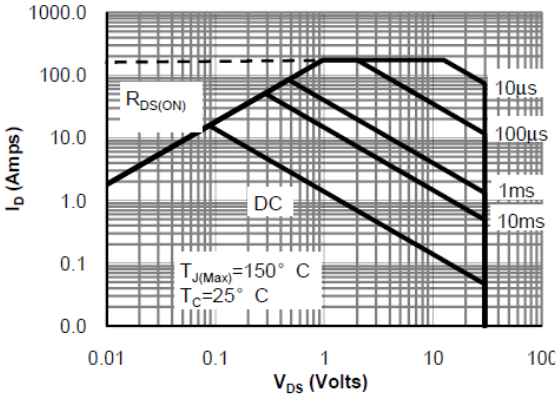


Figure 10. Single Pulse Power Rating Junction-to-Ambient

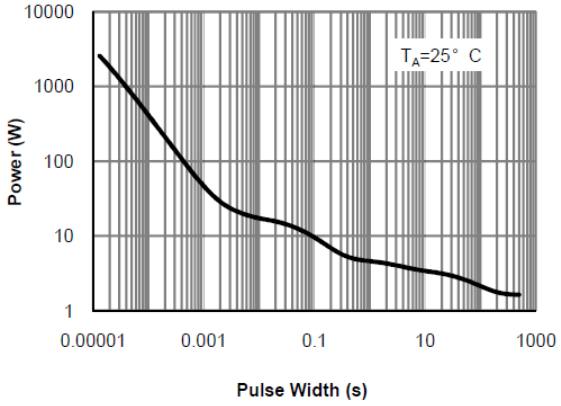
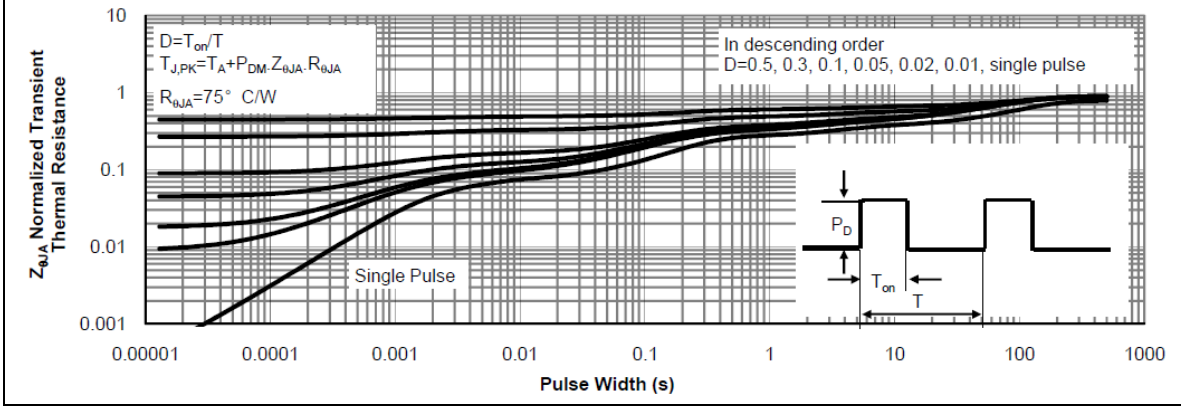
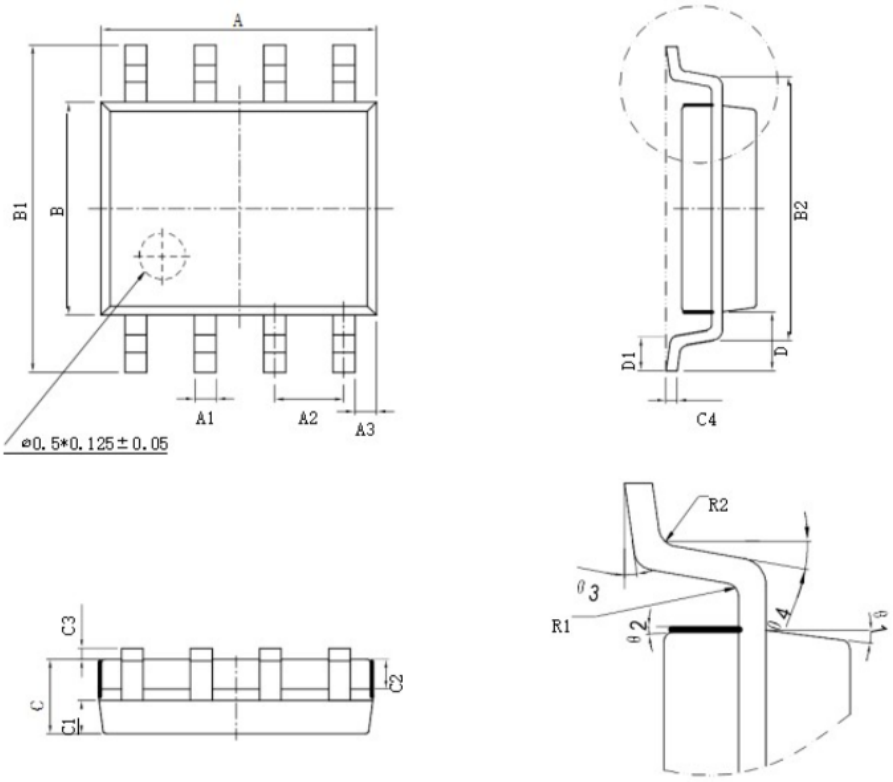


Figure 11. Normalized Maximum Transient Thermal Impedance



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°	