

**• General Description**

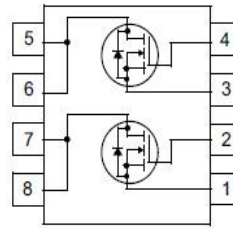
The ZMD68405S combines advanced trench MOSFET technology with a low resistance package to provide extremely low  $R_{DS(ON)}$ . This device is ideal for load switch and battery protection applications.

**• Features**

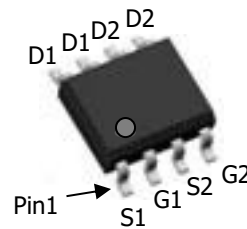
- Advance high cell density Trench technology
- Low  $R_{DS(ON)}$  to minimize conductive loss
- Low Gate Charge for fast switching
- Dual DIE in one package

**• Application**

- Power Management in Notebook Computer,
- Portable Equipment and Battery Powered Systems

**• Product Summary**


$V_{DS1} = 40V$   
 $V_{DS2} = 40V$   
 $R_{DS(ON)1} = 22m\Omega$   
 $R_{DS(ON)2} = 22m\Omega$   
 $I_{D1} = 6.5A$   
 $I_{D2} = 6.5A$



SOP8

**• Ordering Information:**

Part NO.	ZMD68405S
Marking	ZMD68405
Packing Information	REEL TAPE
Basic ordering unit (pcs)	4000

**• Absolute Maximum Ratings ( $T_C = 25^\circ C$ )**

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	$V_{DS}$	40	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Continuous Drain Current	$I_{D@TC=25^\circ C}$	6.5	A
	$I_{D@TC=75^\circ C}$	4.9	A
	$I_{D@TC=100^\circ C}$	4.1	A
Pulsed Drain Current <sup>①</sup>	$I_{DM}$	30	A
Total Power Dissipation	$P_D@TC=25^\circ C$	3.6	W
Total Power Dissipation	$P_D@TA=25^\circ C$	0.69	W
Operating Junction Temperature	$T_J$	-55 to 150	$^\circ C$
Storage Temperature	$T_{STG}$	-55 to 150	$^\circ C$
Single Pulse Avalanche Energy	$E_{AS}$	25	mJ

Avalanche Current	$I_{AS}$ $I_{AR}$	25	A
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**•Thermal resistance**

Parameter	Symbol	Min.	Typ.	Max.	Unit
Thermal resistance, junction - case	$R_{thJC}$	-	-	2.5	° C/W
Thermal resistance, junction - ambient	$R_{thJA}$	-	-	70	° C/W
Soldering temperature, wavesoldering for 10s	$T_{sold}$	-	-	265	° C

**•Electronic Characteristics**

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS} = 0V, I_D = 250\mu A$	40			V
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{GS} = V_{DS}, I_D = 250\mu A$	1.2		2.5	V
Drain-Source Leakage Current	$I_{DSS}$	$V_{DS} = 40V, V_{GS} = 0V$			1.0	$\mu A$
Gate- Source Leakage Current	$I_{GSS}$	$V_{GS} = \pm 20V, V_{DS} = 0V$			$\pm 100$	nA
Static Drain-source On Resistance	$R_{DS(ON)}$	$V_{GS} = 10V, I_D = 6.5A$		22	28	m $\Omega$
		$V_{GS} = 4.5V, I_D = 5.5A$		28	36	m $\Omega$
Forward Transconductance	$g_{FS}$	$V_{DS} = 25V, I_D = 1A$		4		s

**•Electronic Characteristics**

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Input capacitance	$C_{iss}$	$f = 1MHz$	-	850	-	pF
Output capacitance	$C_{oss}$		-	193	-	
Reverse transfer capacitance	$C_{rss}$		-	130	-	

**•Gate Charge characteristics( $T_a = 25^\circ C$ )**

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Total gate charge	$Q_g$	$V_{DD} = 25V$	-	9.8	-	nC
Gate - Source charge	$Q_{gs}$	$I_D = 5A$	-	3.9	-	
Gate - Drain charge	$Q_{gd}$	$V_{GS} = 10V$	-	5.2	-	

Note: ① Pulse Test : Pulse width  $\leq 300\mu s$ , Duty cycle  $\leq 2\%$  ;

Fig.1 Power Dissipation

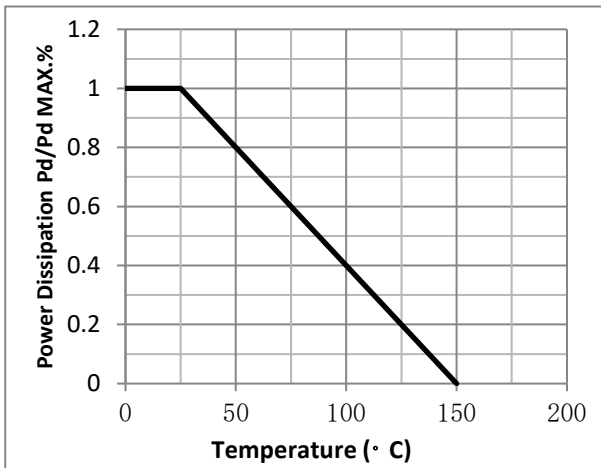


Fig.2 Typical output Characteristics

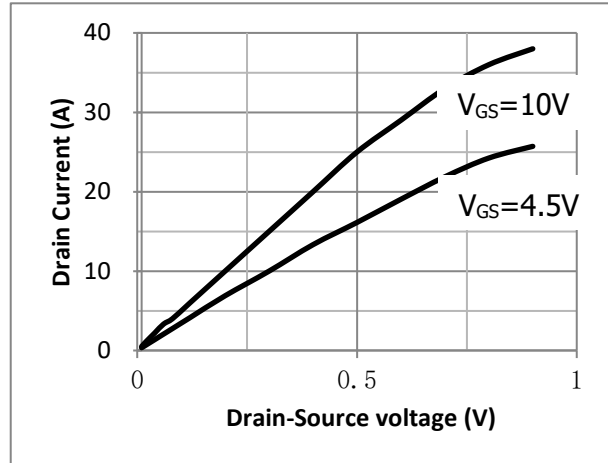


Fig.3 Threshold Voltage V.S Junction Temperature

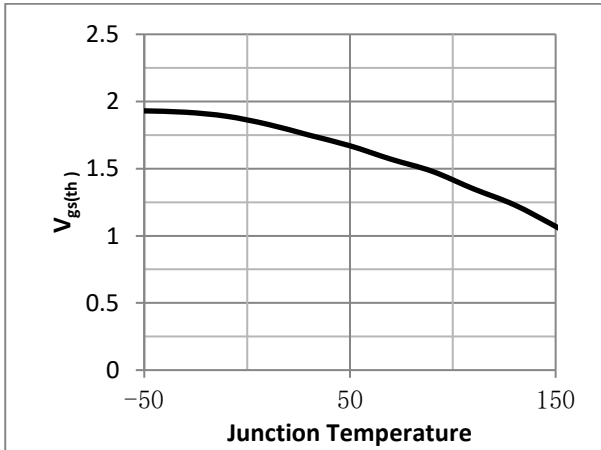


Fig.4 Resistance V.S Drain Current

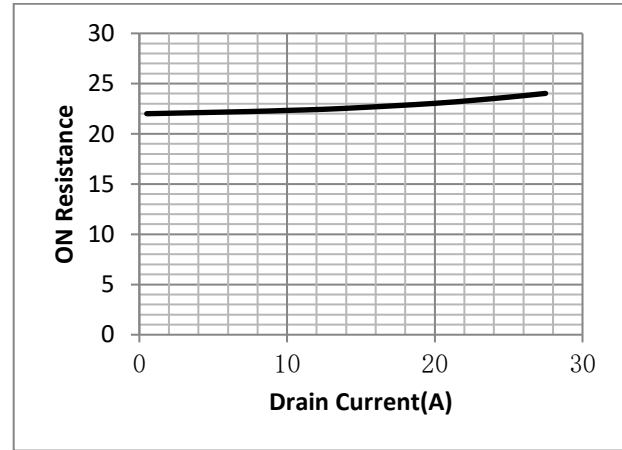


Fig.5 On-Resistance VS Gate Source Voltage

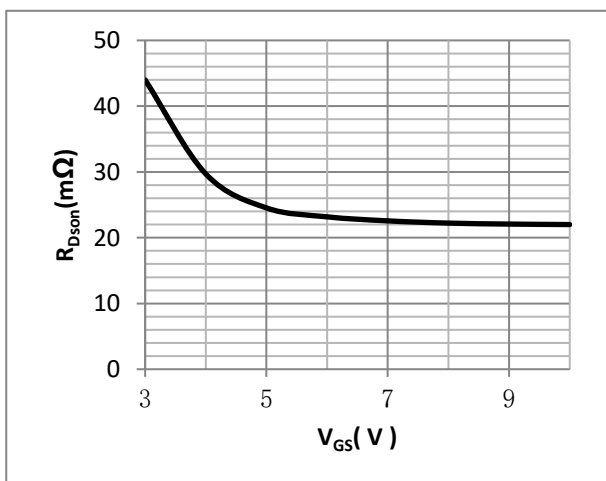


Fig.6 On-Resistance V.S Junction Temperature

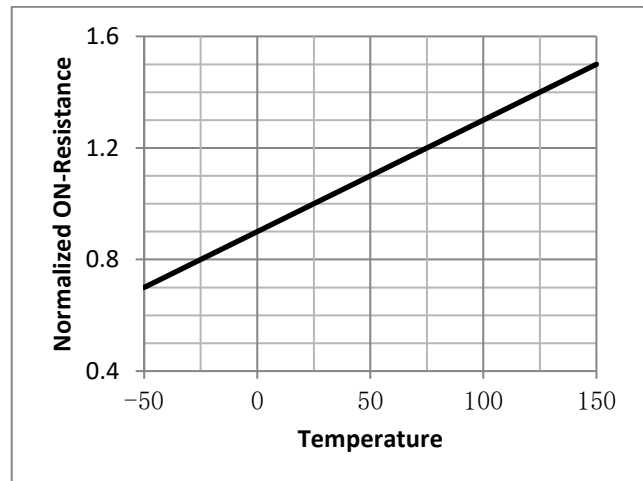


Fig.7 Switching Time Measurement Circuit

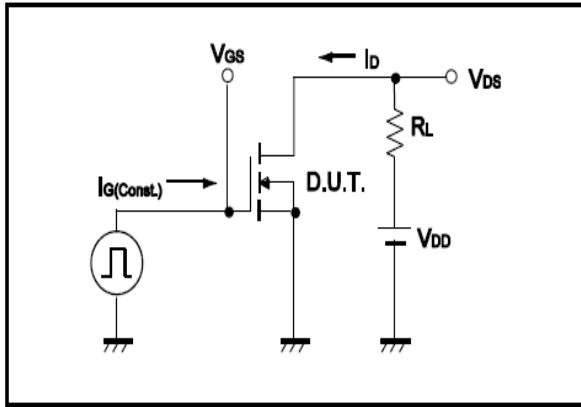


Fig.8 Gate Charge Waveform

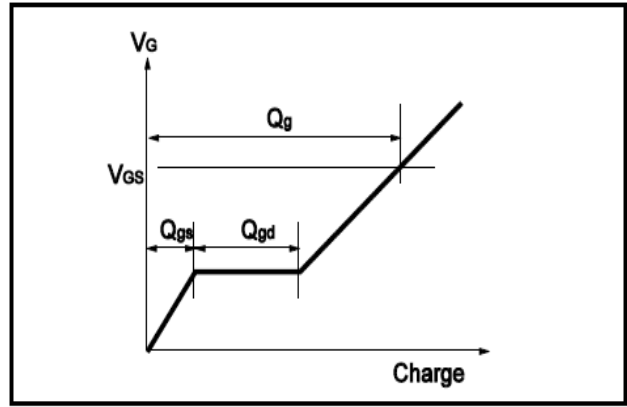


Fig.9 Switching Time Measurement Circuit

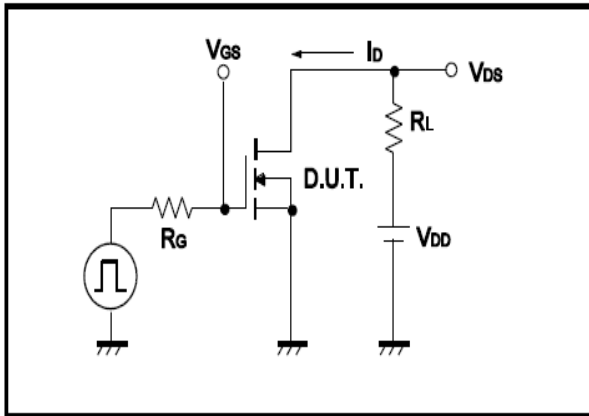


Fig.10 Gate Charge Waveform

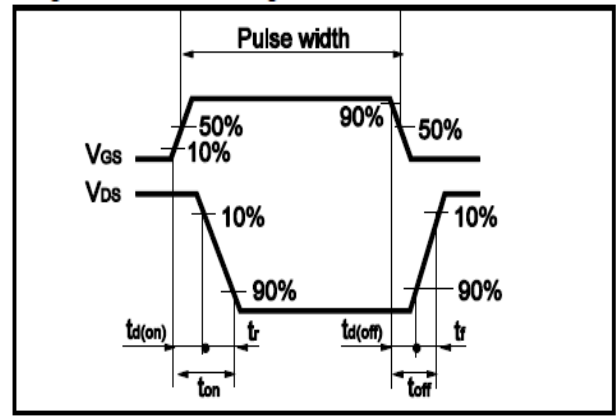


Fig.11 Avalanche Measurement Circuit

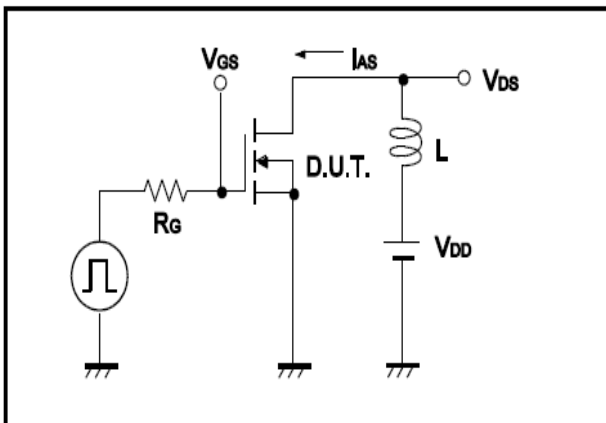
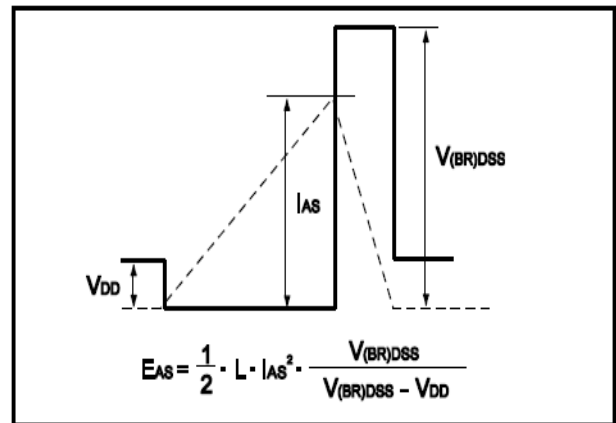


Fig.12 Avalanche Waveform





●Dimensions(SOP8)

Unit: mm

SYMBOL	min	TYP	max	SYMBOL	min		max
A	4.80		5.25	C	1.30		1.75
A1	0.37		0.49	C1	0.55		0.75
A2		1.27		C2	0.55		0.65
A3		0.41		C3	0.05		0.20
B	5.80		6.20	C4	0.10	0.20	0.23
B1	3.80		4.10	D		1.05	
B2		5.00		D1	0.40		0.62

