



## Features

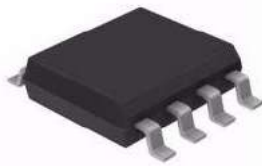
- Advance high cell density Trench technology
- Low  $R_{DS(ON)}$  to minimize conductive loss
- Low Gate Charge for fast switching
- Low Thermal resistance

## Application

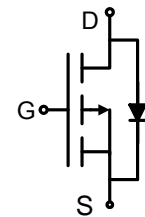
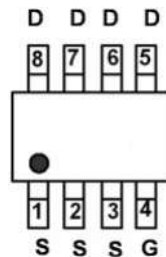
- MB/VGA Vcore
- SMPS 2<sup>nd</sup> Synchronous Rectifier
- POL application
- BLDC Motor driver

## Product Summary

BVDSS	-20	V
$R_{DS(on), Typ@V_{GS}=-10V}$	6.0	mΩ
$I_D$	-13	A



SOP-8



## Absolute Maximum Ratings ( $T_C = 25^\circ\text{C}$ )

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	$V_{DS}$	-20	V
Gate-Source Voltage	$V_{GS}$	$\pm 12$	V
Continuous Drain Current	$I_D@T_C=25^\circ\text{C}$	-13	A
	$I_D@T_C=75^\circ\text{C}$	-8.36	A
	$I_D@T_C=100^\circ\text{C}$	-6.93	A
Pulsed Drain Current <sup>①</sup>	$I_{DM}$	-52	A
Total Power Dissipation <sup>②</sup>	$P_D@T_C=25^\circ\text{C}$	3.6	W
Total Power Dissipation	$P_D@T_A=25^\circ\text{C}$	0.69	W
Operating Junction Temperature	$T_J$	-55 to 150	$^\circ\text{C}$
Storage Temperature	$T_{STG}$	-55 to 150	$^\circ\text{C}$
Single Pulse Avalanche Energy	$E_{AS}$	80	mJ

## Thermal resistance

Parameter	Symbol	Min.	Typ.	Max.	Unit
Thermal resistance, junction - case <sup>②</sup>	$R_{thJC}$	-	-	24	$^\circ\text{C/W}$
Thermal resistance, junction - ambient	$R_{thJA}$	-	-	85	$^\circ\text{C/W}$

**Electronic Characteristics**

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS} = 0V, I_D = -250\mu A$	-20			V
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{GS} = V_{DS}, I_D = -250\mu A$	-0.3	-0.6	-1.0	V
Drain-Source Leakage Current	$I_{DSS}$	$V_{DS} = -20V, V_{GS} = 0V$			-1.0	$\mu A$
Gate- Source Leakage Current	$I_{GSS}$	$V_{GS} = \pm 12V, V_{DS} = 0V$			$\pm 100$	nA
Static Drain-source On Resistance	$R_{DS(ON)}$	$V_{GS} = -10V, I_D = -8A$		6.0	13	m $\Omega$
		$V_{GS} = -4.5V, I_D = -6A$		7.7	16	m $\Omega$
Forward Transconductance	$g_{FS}$	$V_{DS} = -10V, I_D = -5A$		9		s
Source-drain voltage	$V_{SD}$	$I_S = -9A$			1.28	V

**Electronic Characteristics**

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Input capacitance	$C_{iss}$	f = 1MHz	-	2160	-	pF
Output capacitance	$C_{oss}$		-	432	-	
Reverse transfer capacitance	$C_{rss}$		-	288	-	

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

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Total gate charge	$Q_g$	$V_{DD} = 25V$	-	15	-	nC
Gate - Source charge	$Q_{gs}$	$I_D = 8A$	-	4	-	
Gate - Drain charge	$Q_{gd}$	$V_{GS} = 10V$	-	6	-	

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

② Device mounted on FR-4 substrate PC board, 2oz copper, with thermal bias to bottom layer 1inch square copper plate;



Fig.1 Power Dissipation Derating Curve

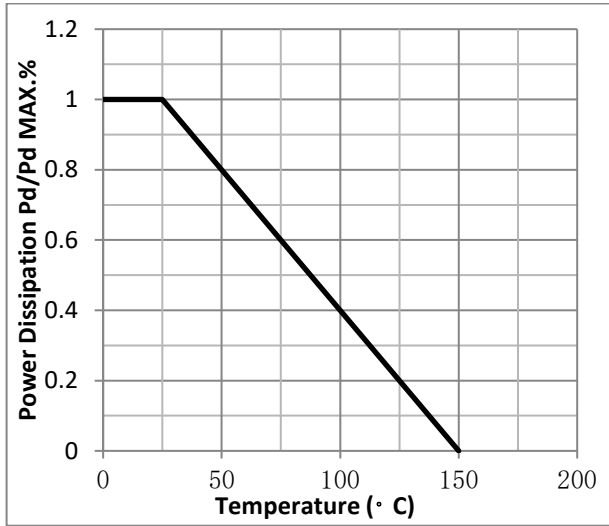


Fig.2 Typical output Characteristics

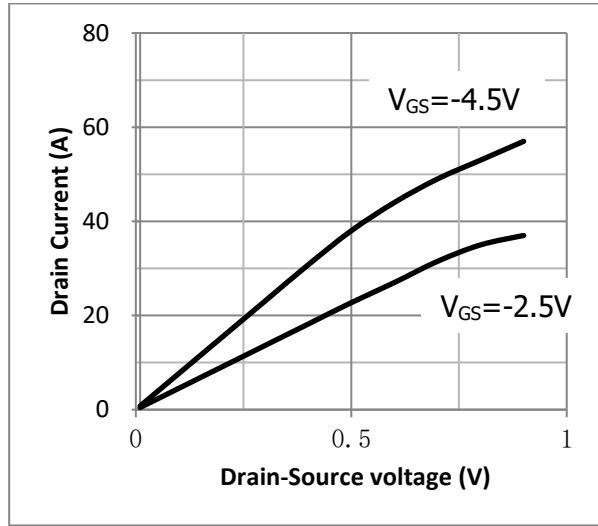


Fig.3 Threshold Voltage V.S Junction Temperature

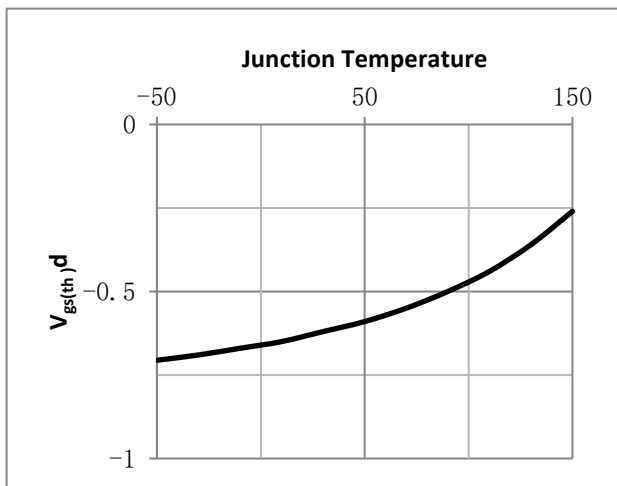


Fig.4 Resistance V.S Drain Current

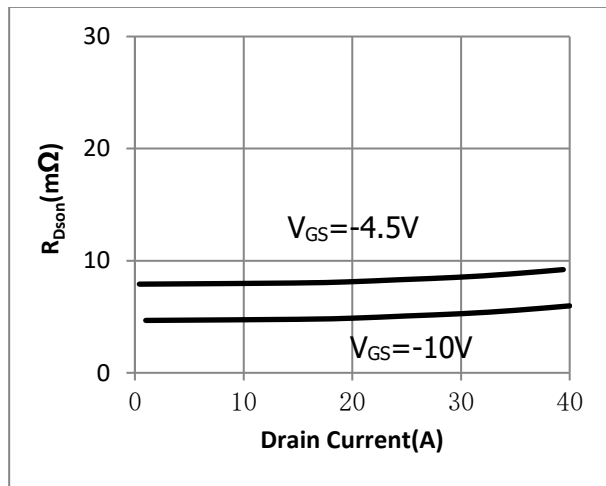


Fig.5 On-Resistance VS Gate Source Voltage

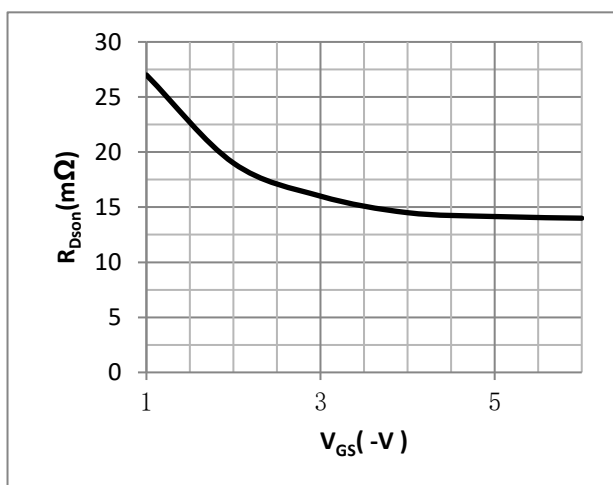


Fig.6 On-Resistance V.S Junction Temperature

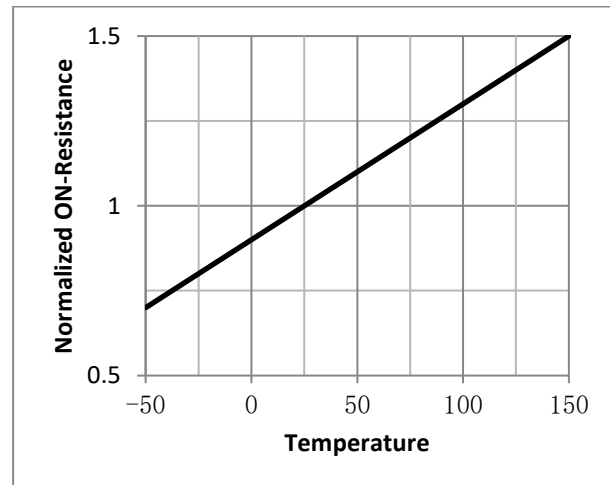


Fig.7 Switching Time Measurement Circuit

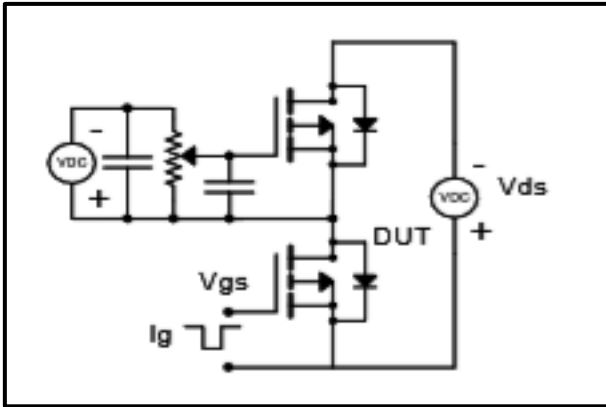


Fig.8 Gate Charge Waveform

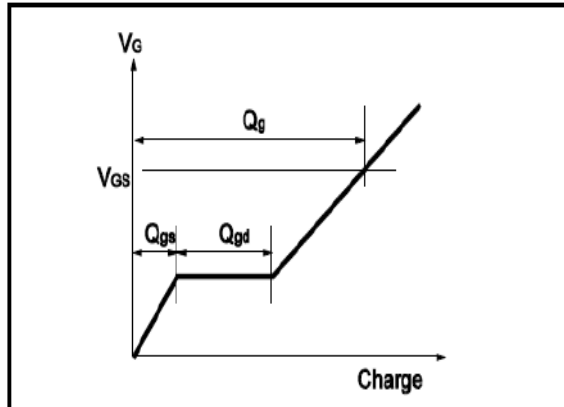


Fig.9 Switching Time Measurement Circuit

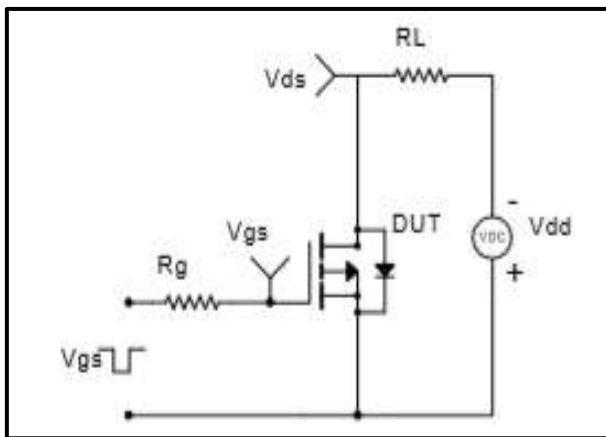


Fig.10 Gate Charge Waveform

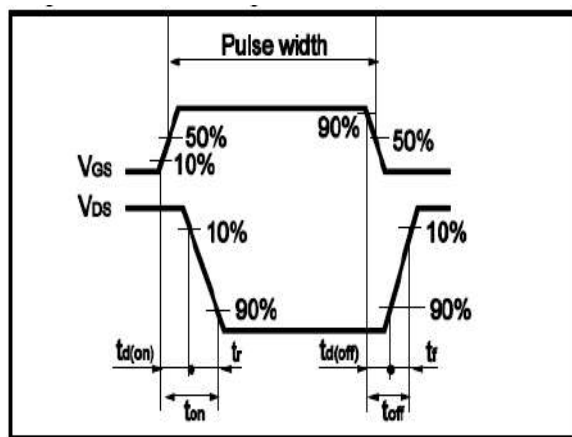


Fig.11 Avalanche Measurement Circuit

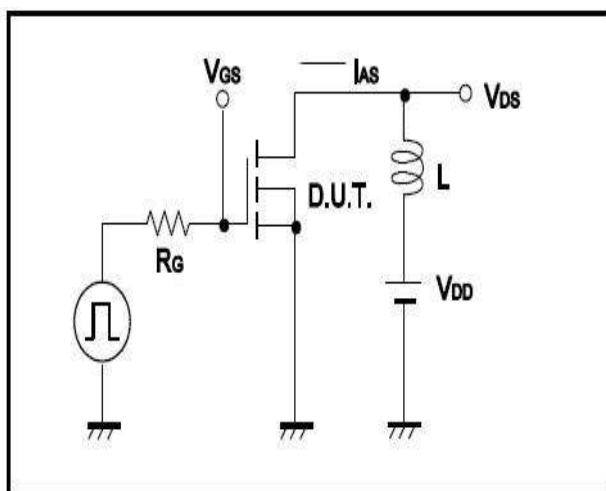
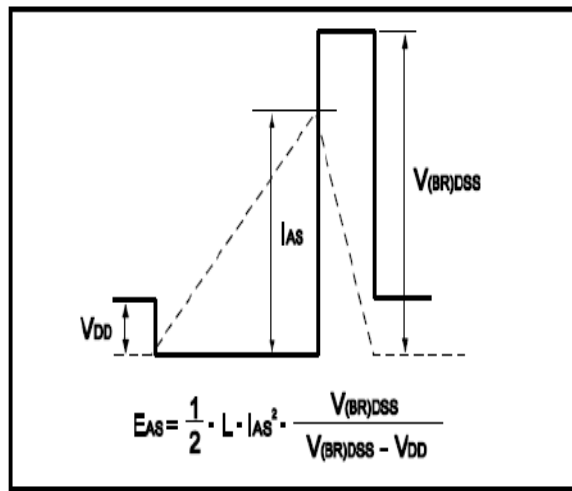
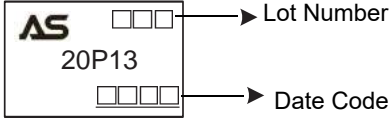


Fig.12 Avalanche Waveform

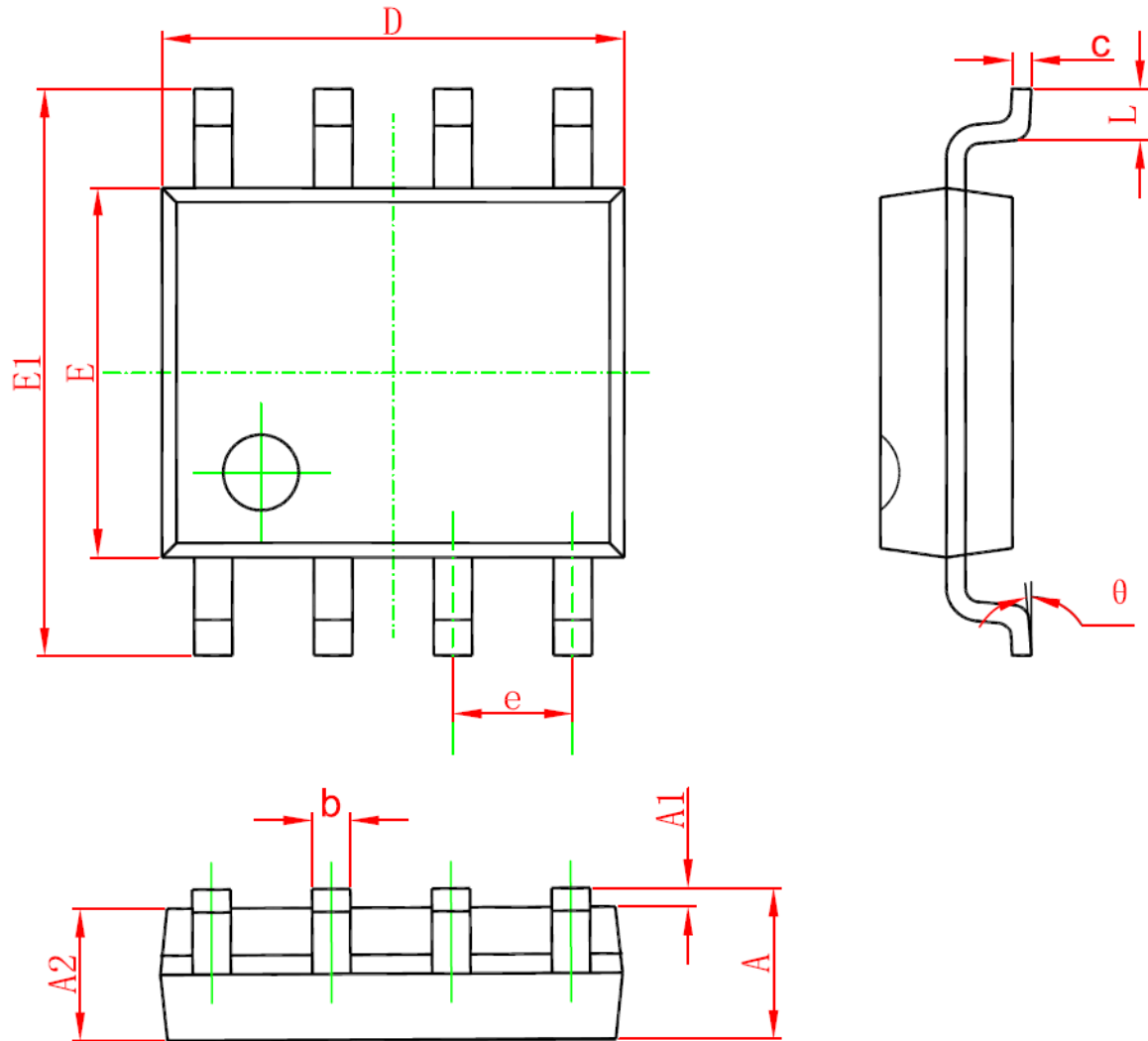


## Ordering and Marking Information

Ordering Device No.	Marking	Package	Packing	Quantity
ASDM20P13S-R	20P13	SOP8	Tape&Reel	4000/Reel

PACKAGE	MARKING
SOP-8	 <p>AS    □□    → Lot Number  20P13  □□□□    → Date Code</p>

## SOP-8 PACKAGE IN FORMATION



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.006	0.010
D	4.700	5.100	0.185	0.200
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
e	1.270 (BSC)		0.050 (BSC)	
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°



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