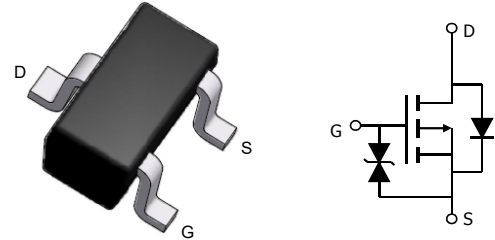**SPSEMI 瞬雷电子**

Features

• *Low R$_{DS(on)}$ @V$_{GS}$=-4.5V*

• *-3.3V Logic Level Control*

• *P Channel SOT23 Package*

• *HMB ESD Protection 2KV*

• *Pb−Free, RoHS Compliant*

V$_{(BR)DSS}$	R$_{DS(ON)}$ Typ	I$_D$ Max
-20V	38mΩ @-4.5V	-4.8A
	43mΩ @ -3.3V	

Applications

• Load Switch

• Switching circuits

• High-speed line driver

• Power Management Functions

SOT23

Order Information

Product	Package	Marking	Packing
SP4002AES	SOT23	A5E	3000PCS/Reel

Absolute Maximum Ratings

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

Symbol	Parameter		Rating	Unit
Common Ratings (T$_A$=25°C Unless Otherwise Noted)				
V$_{GS}$	Gate-Source Voltage		±8	V
V$_{(BR)DSS}$	Drain-Source Breakdown Voltage		-20	V
T$_J$	Maximum Junction Temperature		150	°C
T$_{STG}$	Storage Temperature Range		-50 to 150	°C
Mounted on Large Heat Sink				
I$_{DM}$	Pulse Drain Current Tested①	T$_A$=25°C	-30	A
I$_D$	Continuous Drain Current	T$_A$=25°C	-4.8	A
		T$_A$=70°C	-3.6	
P$_D$	Maximum Power Dissipation	T$_A$=25°C	1.5	W
		T$_A$=70°C	1.0	
R$_{θJA}$	Thermal Resistance Junction-Ambient		80	°C/W

Symbol	Parameter	Condition	Min	Typ	Max	Unit
Static Electrical Characteristics @ T$_J$ = 25°C (unless otherwise stated)						
V$_{(BR)DSS}$	Drain-Source Breakdown Voltage	VGS=0V ID=-250μA	-20	--	--	V
I$_{DSS}$	Zero Gate Voltage Drain Current(TA=25℃)	VDS=-20V, VGS=0V	--	--	-1	μA
	Zero Gate Voltage Drain Current(TA=125℃)	VDS=-16V, VGS=0V	--	--	-100	uA
I$_{GSS}$	Gate-Body Leakage Current	VGS=±8V, VDS=0V	--	--	±10	μA
V$_{GS(TH)}$	Gate Threshold Voltage	VDS=VGS, ID=-250μA	-0.4	-0.7	-1.2	V
R$_{DS(ON)}$	Drain-Source On-State Resistance②	VGS=-4.5V, ID=-4A	--	38	45	mΩ
R$_{DS(ON)}$	Drain-Source On-State Resistance②	VGS=-3.3V, ID=-3A	--	43	55	mΩ
R$_{DS(ON)}$	Drain-Source On-State Resistance②	VGS=-2.5V, ID=-2A	--	52	65	mΩ
Dynamic Electrical Characteristics @ T$_J$ = 25°C (unless otherwise stated)						
C$_{iss}$	Input Capacitance	VDS=-10V, VGS=0V, f=1MHz	--	675	--	pF
C$_{oss}$	Output Capacitance		--	120	--	pF
C$_{rss}$	Reverse Transfer Capacitance		--	85	--	pF
Q$_g$	Total Gate Charge	VDS=-10V ID=-4A, VGS=-4.5V	--	14.2	--	nC
Q$_{gs}$	Gate Source Charge		--	3.2	--	nC
Q$_{gd}$	Gate Drain Charge		--	5.8	--	nC
Switching Characteristics						
t$_{d(on)}$	Turn on Delay Time	VDD=-10V, ID=-2A, RG=3.3Ω, VGS=-4.5V	--	15	--	ns
t$_r$	Turn on Rise Time		--	11	--	ns
t$_{d(off)}$	Turn Off Delay Time		-	22	--	ns
t$_f$	Turn Off Fall Time		--	35	--	ns
Source Drain Diode Characteristics						
I$_{SD}$	Source drain current(Body Diode)	TA=25℃	--	--	-2	A
V$_{SD}$	Forward on voltage②	Tj=25℃, ISD=-2A, VGS=0V	--	-0.83	-1.2	V

Notes:

① Pulse width limited by maximum allowable junction temperature

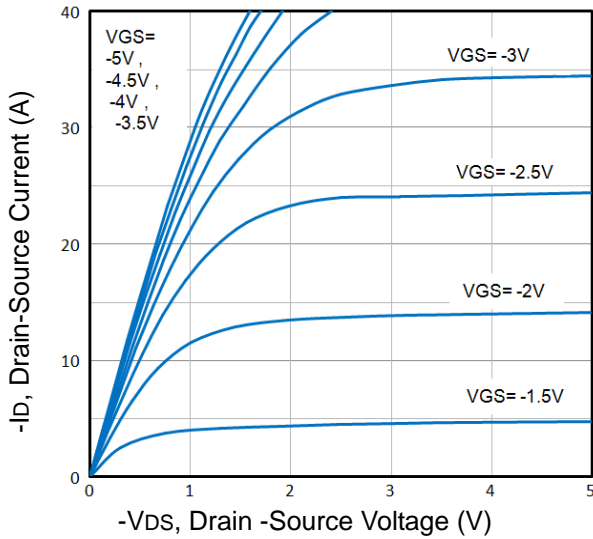②Pulse test ; Pulse width≤300μs, duty cycle≤2%.

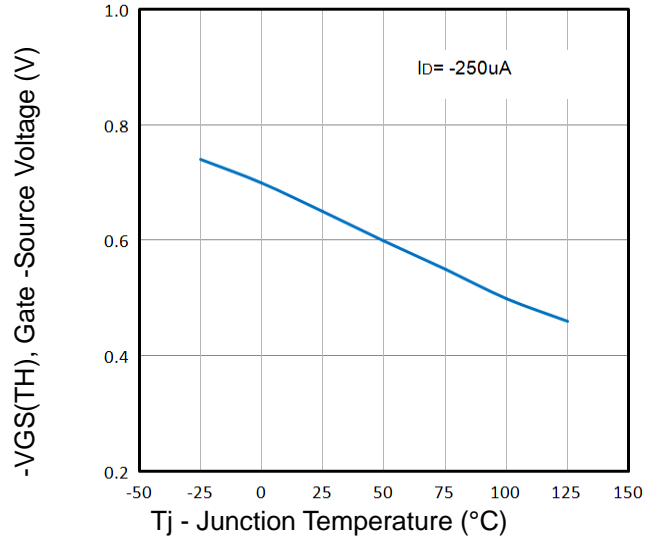## Typical Characteristics

Fig1. Typical Output Characteristics

Fig2. Normalized Threshold Voltage Vs. Temperature
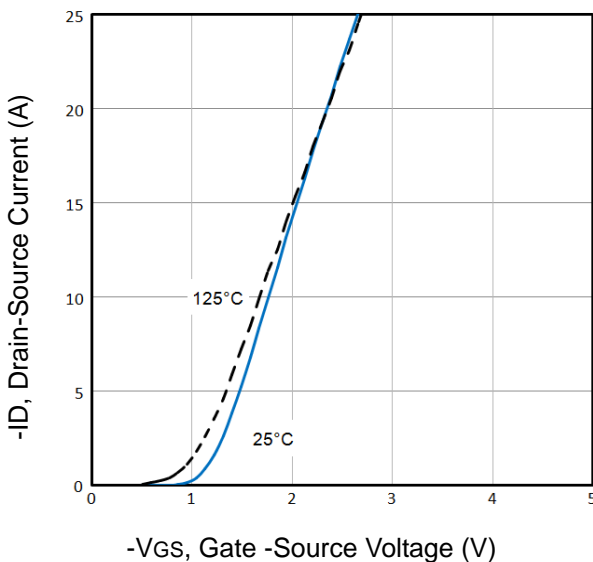
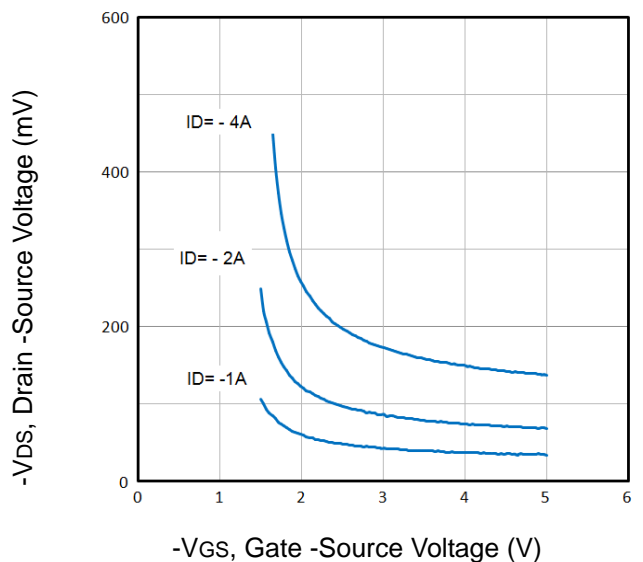**Fig3.** Typical Transfer Characteristics

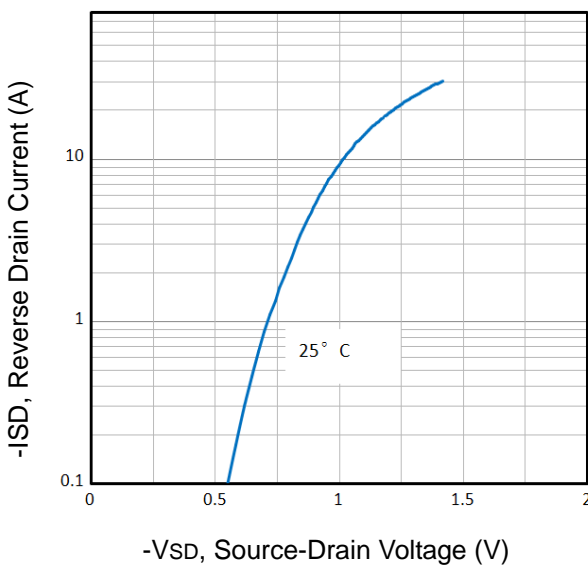**Fig4.** Drain -Source Voltage vs Gate -Source Voltage

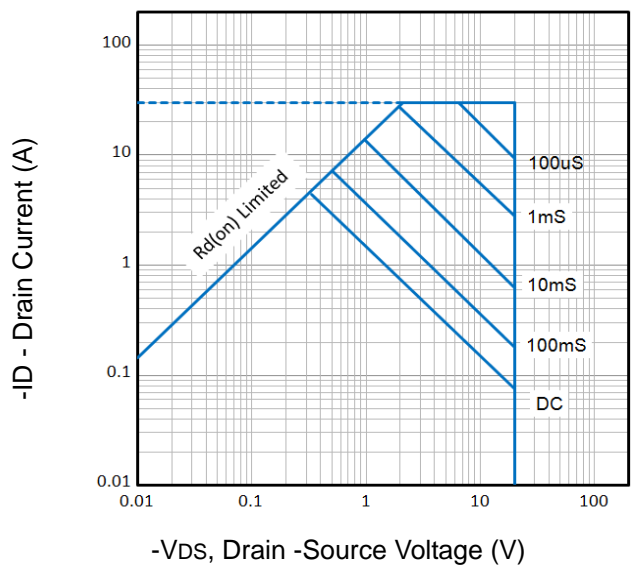**Fig5.** Typical Source-Drain Diode Forward Voltage

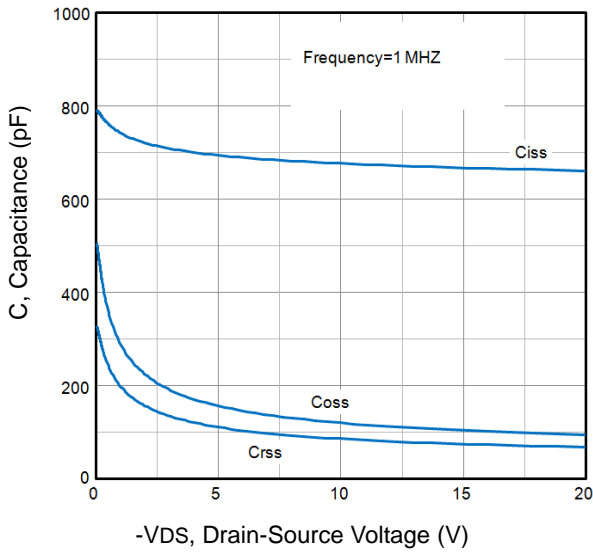**Fig6.** Maximum Safe Operating Area

Typical Characteristics

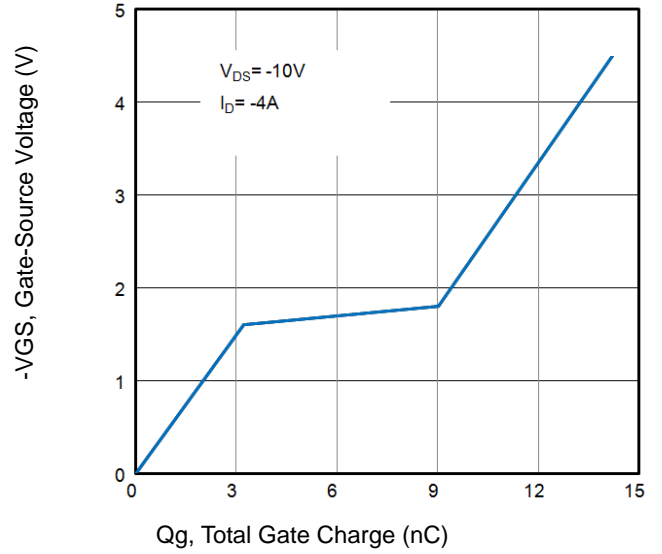Fig7. Typical Capacitance Vs. Drain-Source Voltage
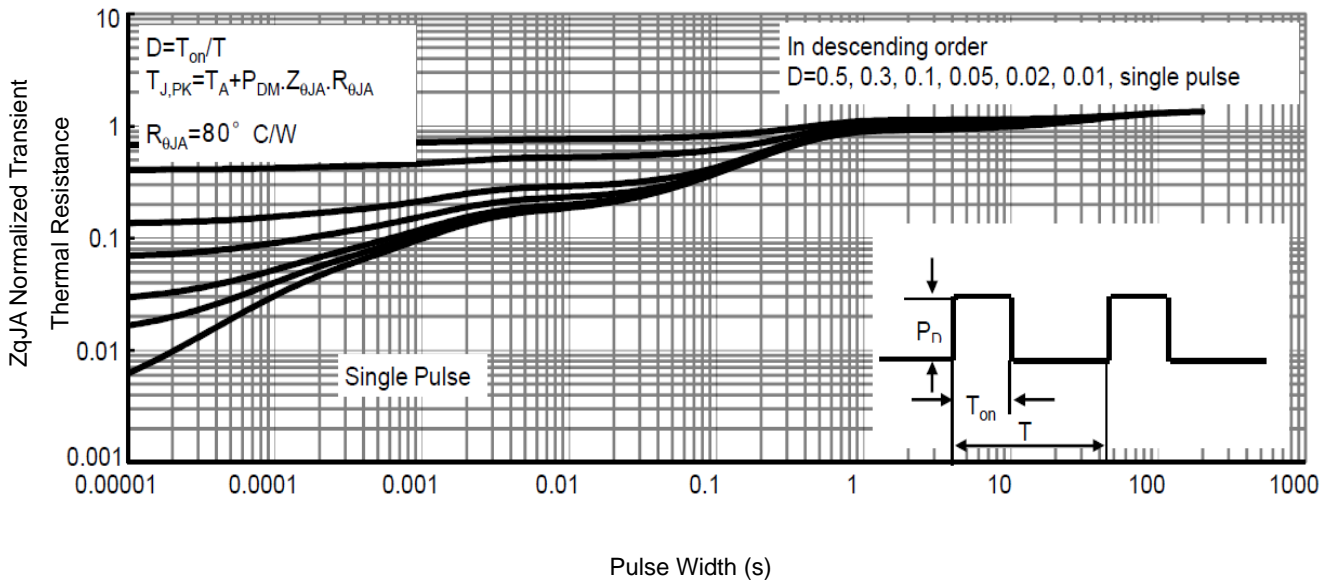

Fig8. Typical Gate Charge Vs. Gate-Source Voltage

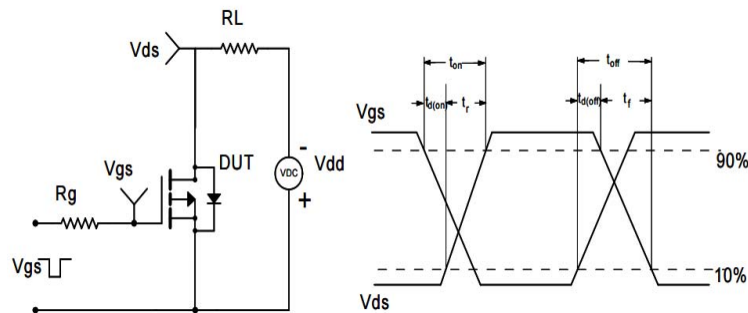Pulse Width (s)

Fig9. Normalized Maximum Transient Thermal Impedance

Fig10. Switching Time Test Circuit and waveforms

SOT23 Mechanical Data

detail X

0   1   2 mm
scale

DIMENSIONS (unit : mm)

Symbol	Min	Typ	Max	Symbol	Min	Typ	Max
A	0.90	1.01	1.15	A_1	0.01	0.05	0.10
b_p	0.30	0.42	0.50	c	0.08	0.13	0.15
D	2.80	2.92	3.00	E	1.20	1.33	1.40
e	--	1.90	--	e_1	--	0.95	--
H_E	2.25	2.40	2.55	L_p	0.30	0.42	0.50
Q	0.45	0.49	0.55	v	--	0.20	--
w	--	0.10	--				

单击下面可查看定价，库存，交付和生命周期等信息

>>SPSEMI