JSMSEMI
杰盛微半导体

Features

- Low RDS(on)@VGS=4.5V
- 3.3V Logic Level Control
- N-Channel SOT23 Package
- Pb−Free,RoHS Compliant

Applications

- Load Switch
- DC/DC Converter
- Switching Circuits
- Power Management

$V_{(BR)DSS}$	$R_{DS(ON)}$ Typ	I_D Max
20V	21mΩ @ 4.5V	6A
	28mΩ @ 3.3V	

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		±10	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	24.8	A
I_D	Continuous Drain Current	T_A=25°C	6	A
		T_A=70°C	4.2	
P_D	Maximum Power Dissipation	T_A=25°C	1.56	W
		T_A=70°C	0.9	
$R_{\theta JA}$	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	V$_{GS}$=0V I$_D$=250µA	20	--	--	V
I$_{DSS}$	Zero Gate Voltage Drain Current(T$_A$=25℃)	V$_{DS}$=16V, V$_{GS}$=0V	--	--	1	µA
	Zero Gate Voltage Drain Current(T$_A$=125℃)	V$_{DS}$=16V, V$_{GS}$=0V	--	--	100	uA
I$_{GSS}$	Gate-Body Leakage Current	V$_{GS}$=±10V, V$_{DS}$=0V	--	--	±100	nA
V$_{GS(TH)}$	Gate Threshold Voltage	V$_{DS}$=V$_{GS}$, I$_D$=250µA	0.45	0.6	1.0	V
R$_{DS(ON)}$	Drain-Source On-State Resistance②	V$_{GS}$=4.5V, I$_D$=4A	--	21		mΩ
R$_{DS(ON)}$	Drain-Source On-State Resistance②	V$_{GS}$=3.3V, I$_D$=3A	--	28		mΩ
Dynamic Electrical Characteristics @ T$_J$ = 25°C (unless otherwise stated)						
C$_{iss}$	Input Capacitance	V$_{DS}$=10V, V$_{GS}$=0V, f=1MHz	--	457	--	pF
C$_{oss}$	Output Capacitance		--	71	--	pF
C$_{rss}$	Reverse Transfer Capacitance		--	66	--	pF
R$_g$	Gate Resistance	f=1MHz		7.8		Ω
Q$_g$	Total Gate Charge	V$_{DS}$=10V I$_D$=4A, V$_{GS}$=4.5V	--	6.6	--	nC
Q$_{gs}$	Gate Source Charge		--	0.4	--	nC
Q$_{gd}$	Gate Drain Charge		--	2	--	nC
Switching Characteristics @ T$_J$ = 25°C (unless otherwise stated)						
t$_{d(on)}$	Turn on Delay Time	V$_{DD}$=10V, I$_D$=1A, R$_G$=3.3Ω, V$_{GS}$=4.5V	--	4.1	--	ns
t$_r$	Turn on Rise Time		--	11.6	--	ns
t$_{d(off)}$	Turn Off Delay Time		-	24	--	ns
t$_f$	Turn Off Fall Time		--	7.6	--	ns
Source Drain Diode Characteristics @ T$_J$ = 25°C (unless otherwise stated)						
I$_{SD}$	Source drain current(Body Diode)	T$_A$=25℃	--	--	2	A
V$_{SD}$	Forward on voltage②	T$_j$=25℃, I$_{SD}$=4A, V$_{GS}$=0V	--	0.79	1.2	V

Notes:

① Pulse width limited by maximum allowable junction temperature

②Pulse test ; Pulse width≤300µs, duty cycle≤2%.
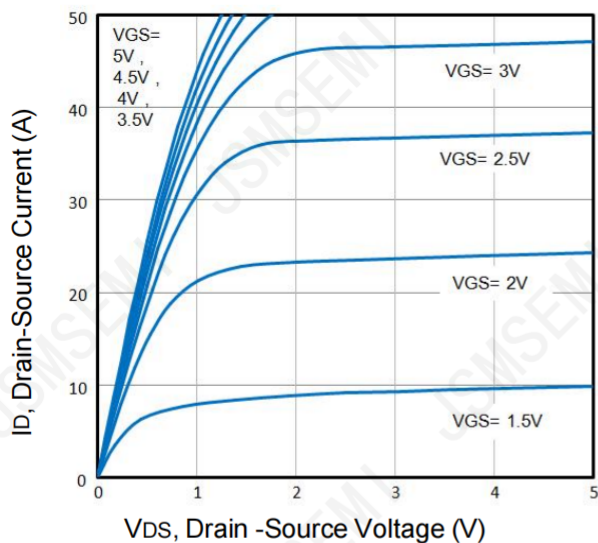
Fig1. Typical Output Characteristics
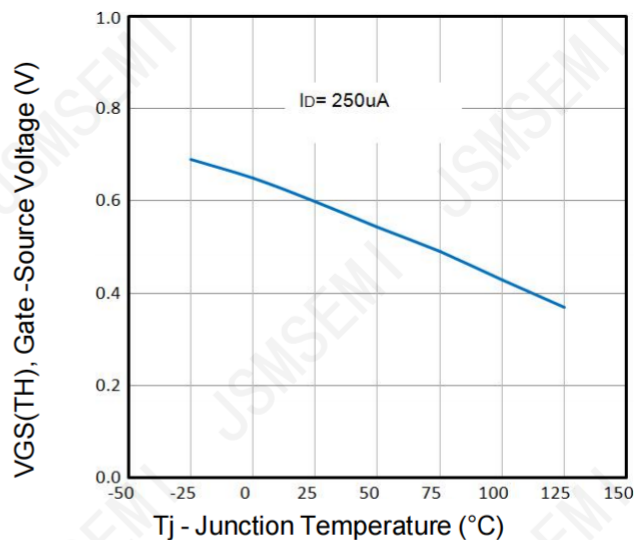
Fig2. VGS(TH) Voltage Vs. Temperature
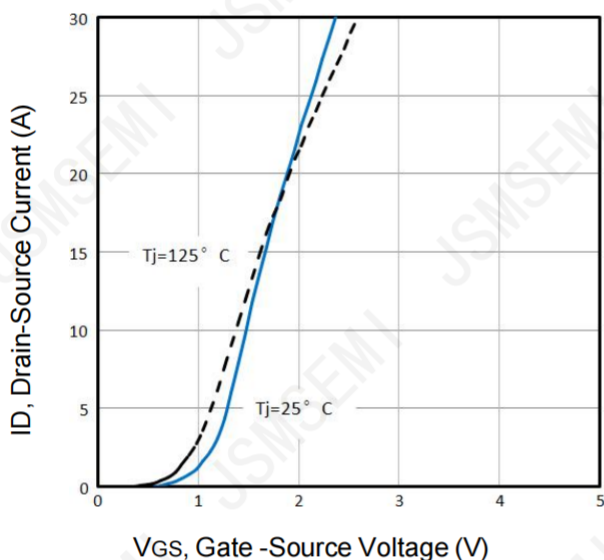
Fig3. Typical Transfer Characteristics
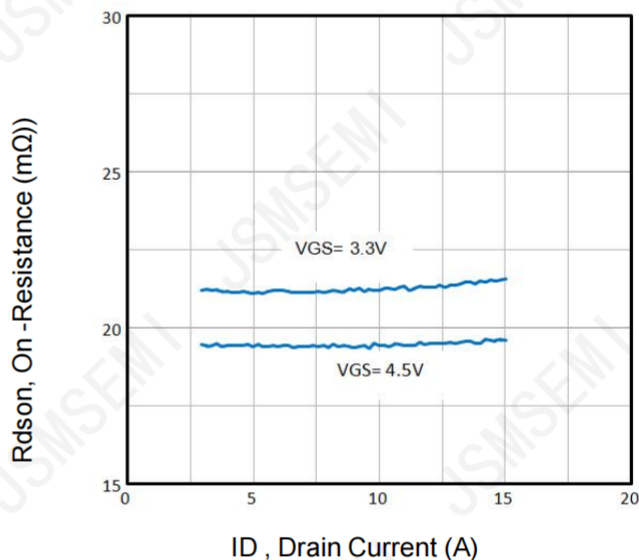
Fig4. On-Resistance vs. Drain Current and Gate
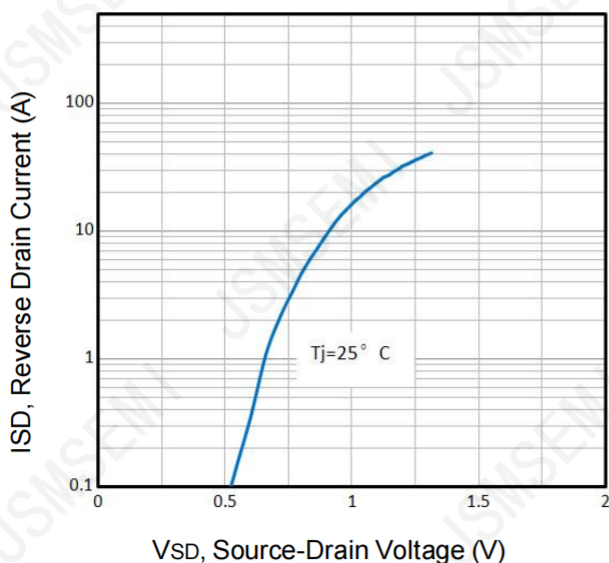
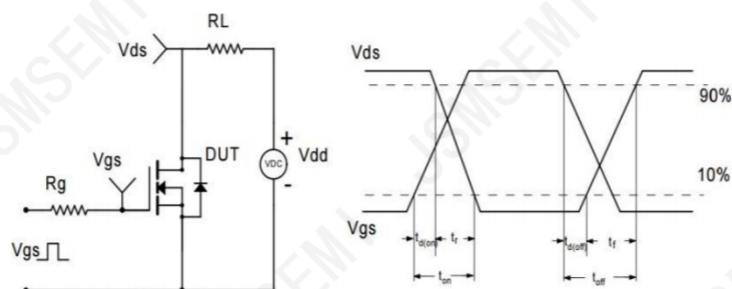**Fig5.** Typical Source-Drain Diode Forward Voltage
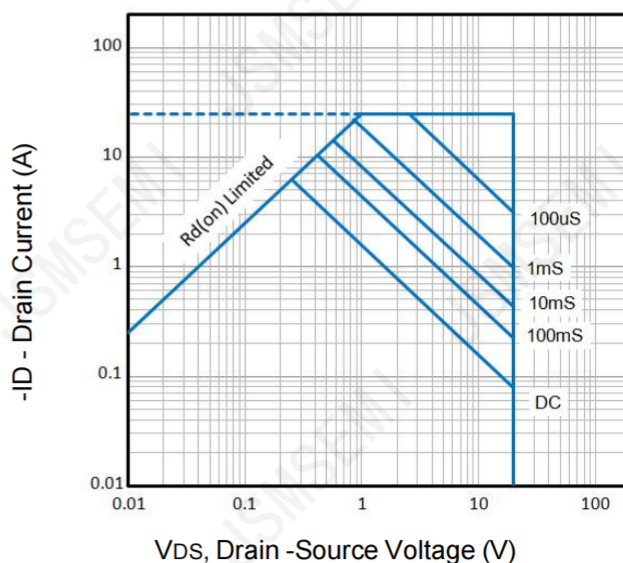
Fig6. Maximum Safe Operating Area
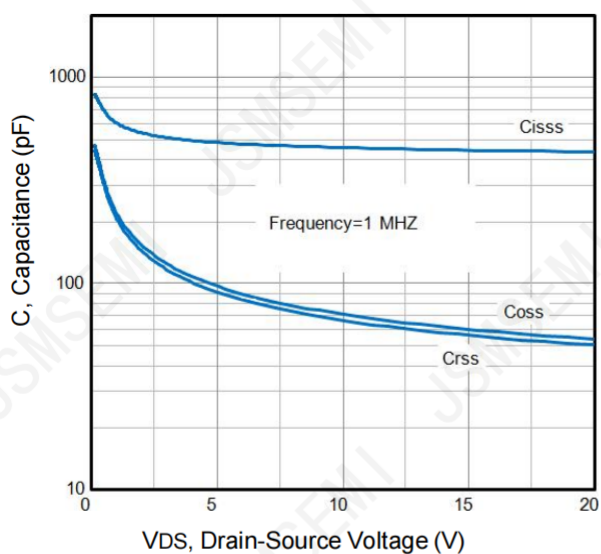
Fig7. Typical Capacitance Vs. Drain-Source Voltage
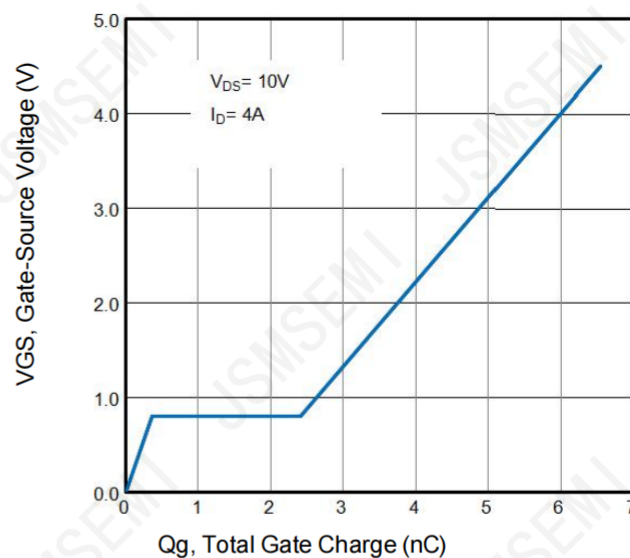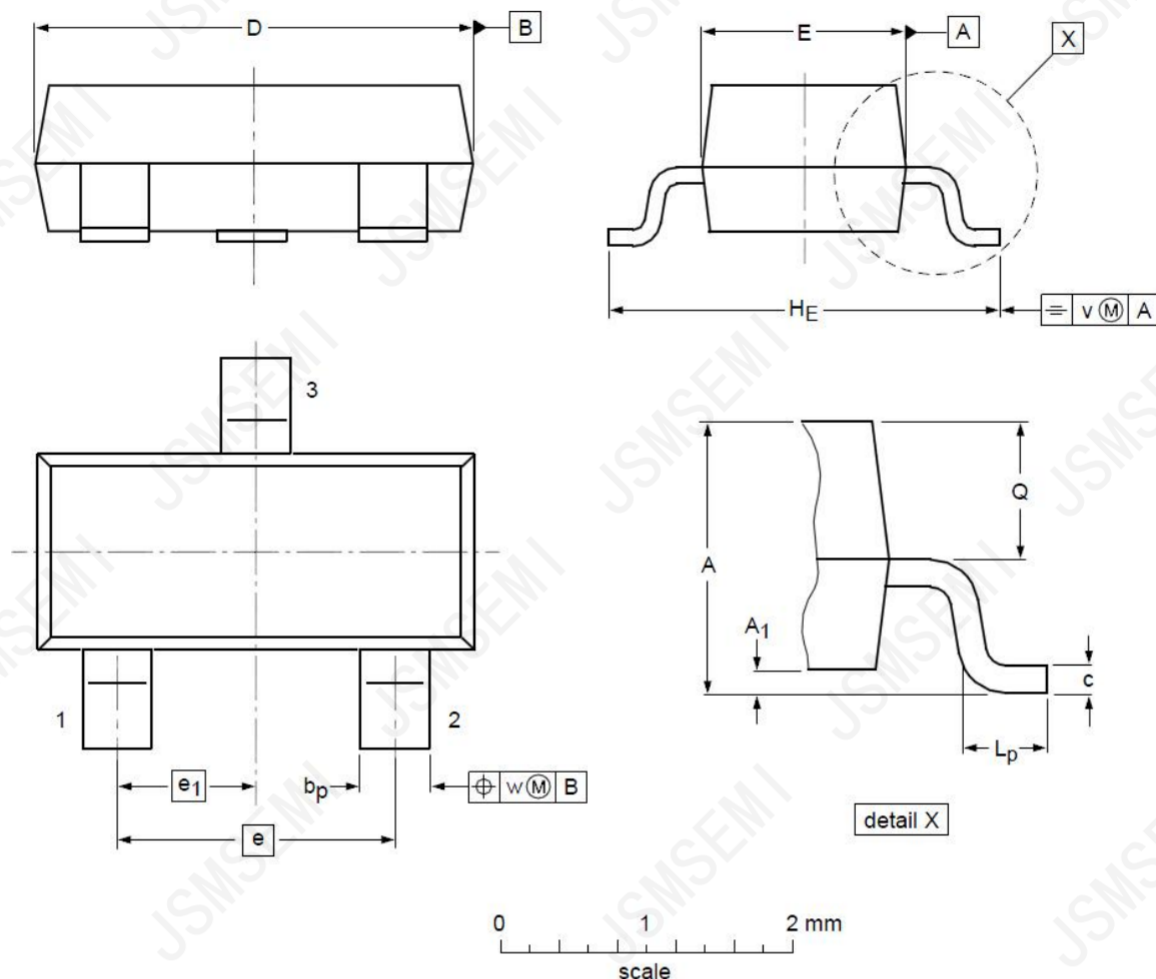
Fig8. Typical Gate Charge Vs. Gate-Source Voltage
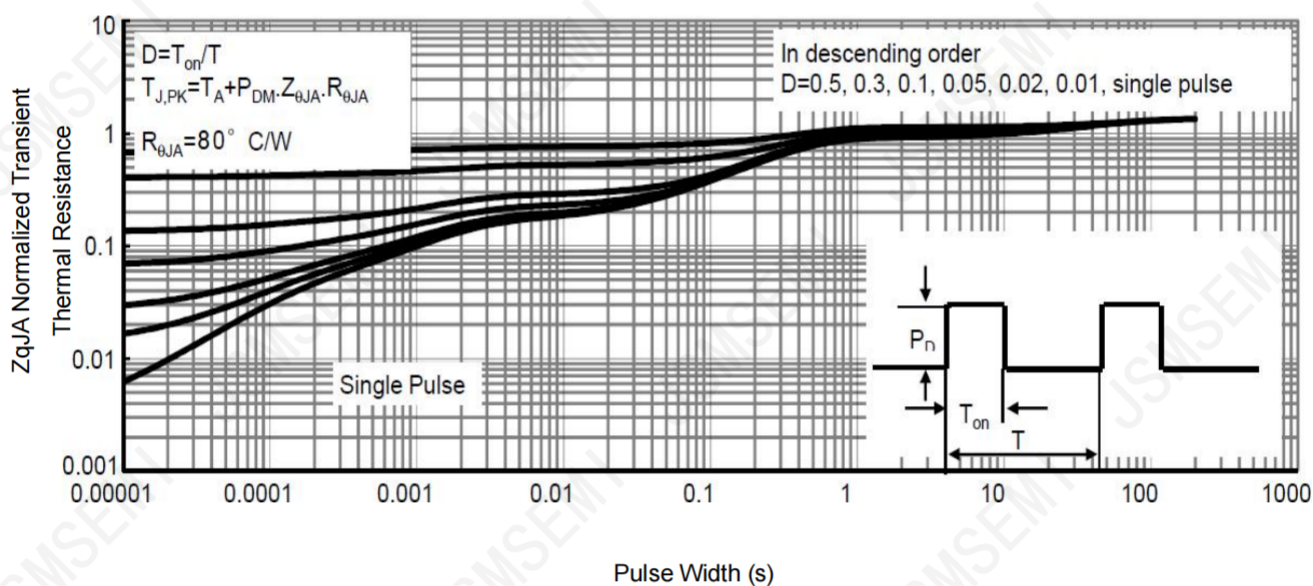
Fig9. Normalized Maximum Transient Thermal Impedance

Fig10. Switching Time Test Circuit and waveforms

SOT23-3 Mechanical Data

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	--				

Revision History

Rev.	Change	Date
V1.0	Initial version	2/23/2024

Important Notice