

Product Summary

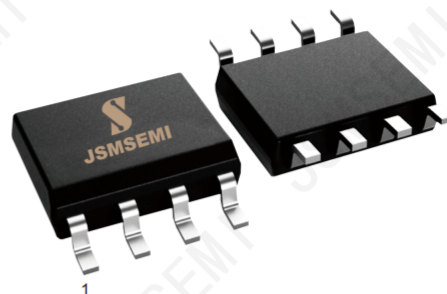
- V_{DS} 150V
- I_D 10A
- $R_{DS(ON)}$ (at $V_{GS}=10V$) $<40m\Omega$
- 100% EAS Tested
- 100% ∇V_{DS} Tested

General Description

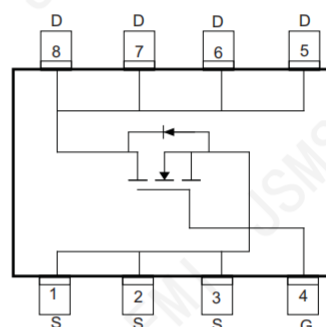
- Split gate trench MOSFET technology
- Excellent package for heat dissipation
- High density cell design for low $R_{DS(ON)}$
- Moisture Sensitivity Level 1
- Epoxy Meets UL 94 V-0 Flammability Rating
- Halogen Free

Applications

- Power switching application
- Uninterruptible power supply
- DC-DC convertor
- Motor drivers



Top View



■ Absolute Maximum Ratings ($T_A=25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	150	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current ($T_c=25^\circ\text{C}$) ⁽¹⁾	I_D	10	A
Continuous Drain Current ($T_c=100^\circ\text{C}$)	I_D	7	A
Pulsed Drain Current ⁽¹⁾	I_{DM}	40	A
Drain Power Dissipation	P_D	28	W
Single Pulsed Avalanche Energy ⁽²⁾	E_{AS}	169	mJ
Thermal Resistance from Junction to Ambient	$R_{\theta JA}$	51	$^\circ\text{C/W}$
Thermal Resistance from Junction to Case	$R_{\theta JC}$	2.6	$^\circ\text{C/W}$
Junction Temperature	T_J	-55~ +150	$^\circ\text{C}$
Storage Temperature	T_{STG}	-55~ +150	$^\circ\text{C}$

Notes:

- 1) Repetitive Rating: pulse width limited by maximum junction temperature
- 2) EAS condition : $T_J=25^\circ\text{C}$, $V_{DD}=75V$, $V_G=10V$, $L=0.5mH$, $R_g=25\Omega$, $I_{AS}=26A$

Ordering Information

Order number	Package	Marking	Operation Temperature Range	MSL Grade	Ship,Quantity	Green
FDS86242-JSM	SOP-8	FDS86242	-55 to 150°C	1	T&R,3000	Rohs

■ Electrical Characteristics ($T_J=25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Static Characteristics						
Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu A$	150	-	-	V
Zero gate voltage drain current	I_{DSS}	$V_{DS}=150V, V_{GS}=0V$	-	-	1	μA
Gate-body leakage current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	± 100	nA
Gate threshold voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	2.0	3.4	4.0	V
Drain-source on-resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=5A$	-	30	40	m Ω
		$V_{GS}=6V, I_D=4A$	-	40	50	m Ω
Gate Resistance	R_g	$V_{GS}=0V, V_{DS}=0V, f=1.0MHz$	-	1.5	-	Ω
Dynamic characteristics						
Input Capacitance	C_{iss}	$V_{DS}=75V, V_{GS}=0V, f=1MHz$	-	1240	-	pF
Output Capacitance	C_{oss}		-	115	-	
Reverse Transfer Capacitance	C_{rss}		-	3.5	-	
Switching characteristics						
Turn-on delay time	$t_{d(on)}$	$V_{GS}=10V, V_{DS}=75V$ $R_G=3\Omega, I_D=10A$	-	8.9	-	ns
Turn-on rise time	t_r		-	4.3	-	
Turn-off delay time	$t_{d(off)}$		-	14.1	-	
Turn-off fall time	t_f		-	4.8	-	
Total Gate Charge	Q_g	$V_{DS}=75V, I_D=10A,$ $V_{GS}=10V$	-	18.2	-	nC
Gate-Source Charge	Q_{gs}		-	6.2	-	
Gate-Drain Charge	Q_{gd}		-	3.8	-	
Gate Plateau	$V_{plateau}$		-	5	-	V
Source-Drain Diode characteristics						
Diode Forward voltage	V_{SD}	$T_J=25^{\circ}C, V_{GS}=0V, I_D=10A$	-	-	1.2	V
Diode Forward current	I_S	$T_C=25^{\circ}C$	-	-	10	A
Body Diode Reverse Recovery Time	T_{rr}	$T_J=25^{\circ}C, di/dt=100A/us,$	-	70.6	-	ns
Body Diode Reverse Recovery Charge	Q_{rr}	$I_D=10A$	-	182.2	-	nC

■ Typical Electrical and Thermal Characteristics Diagrams

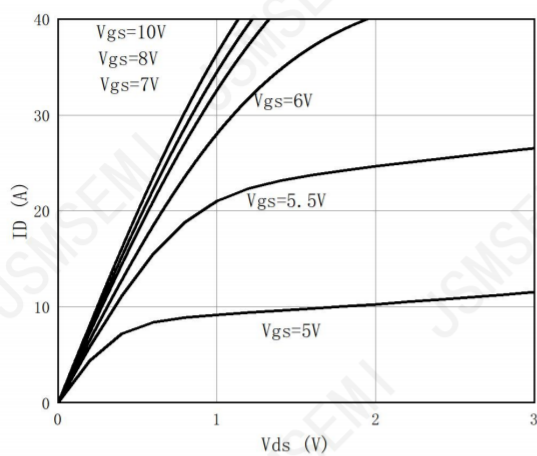


Figure 1. Output Characteristics

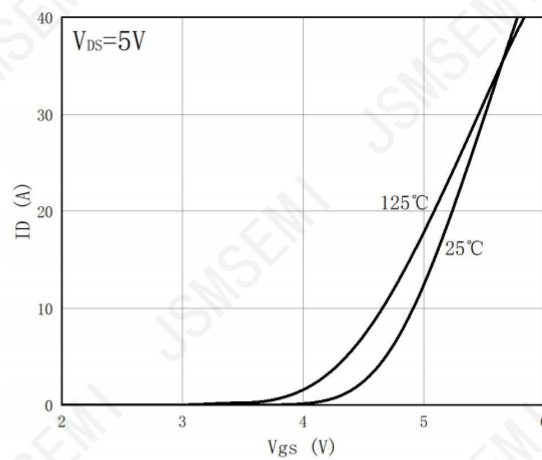


Figure 2. Transfer Characteristics

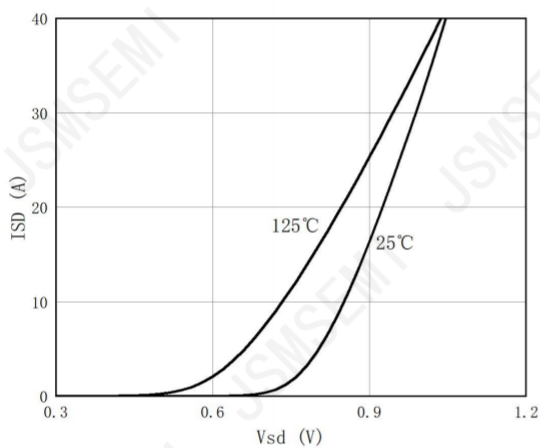


Figure 3. Source Drain Forward Characteristics

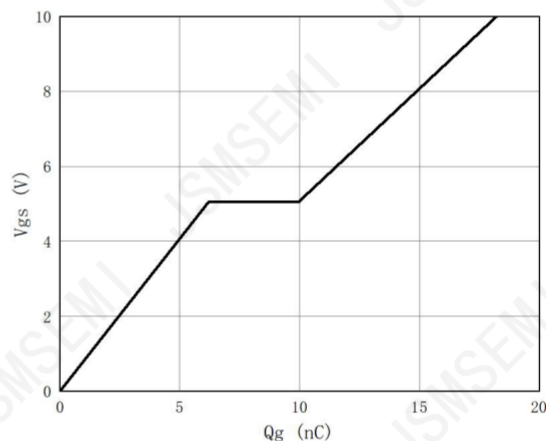


Figure 4. Gate-Charge Characteristics

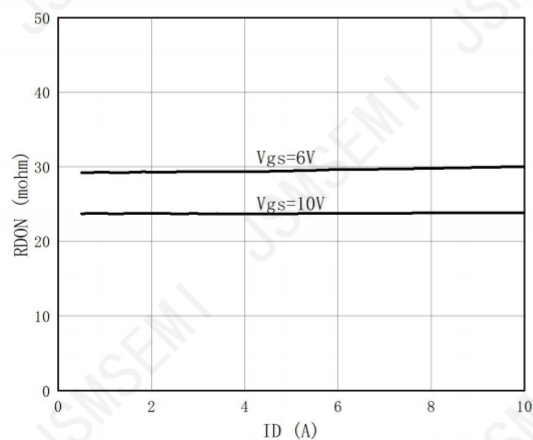


Figure 5. On-Resistance vs. Drain Current and Gate Voltage

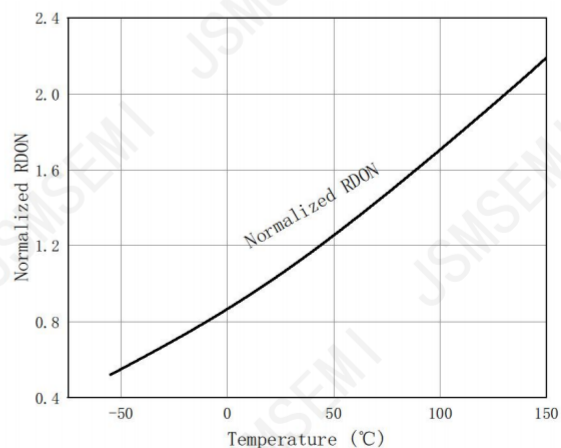


Figure 6. $R_{DS(ON)}$ vs Junction Temperature

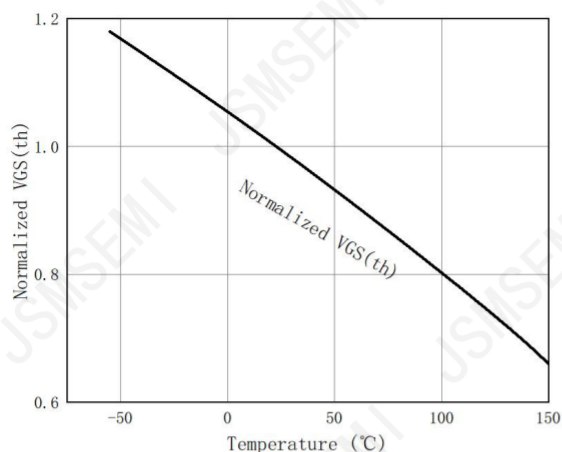


Figure 7: V_{th} vs Junction Temperature

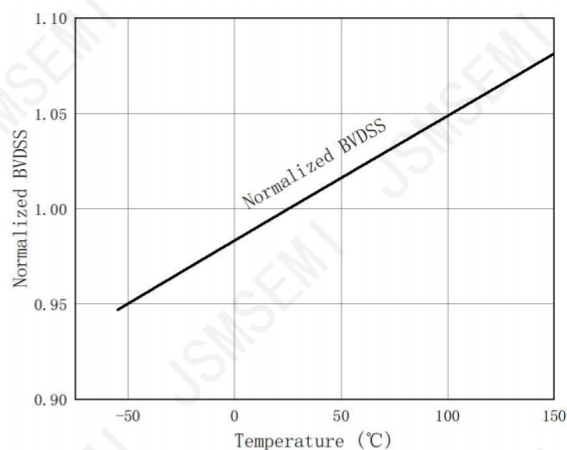


Figure 8: $BVDSS$ vs. Junction Temperature

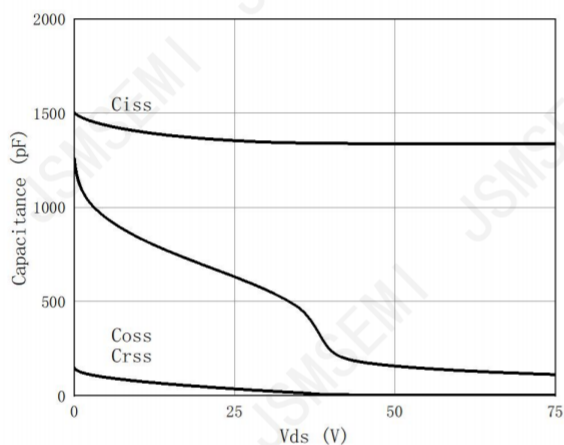


Figure 9: Capacitance

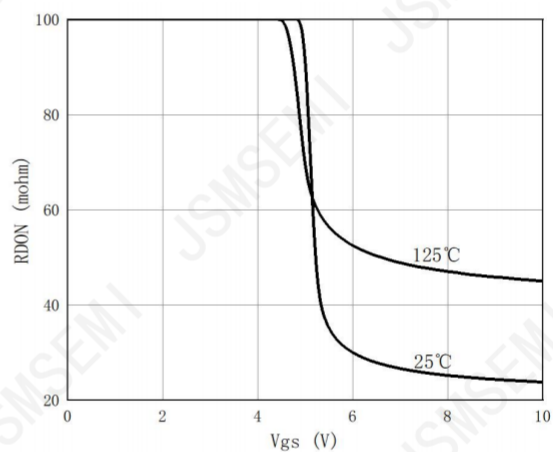


Figure 10: On-Resistance vs. Gate-Source Voltage

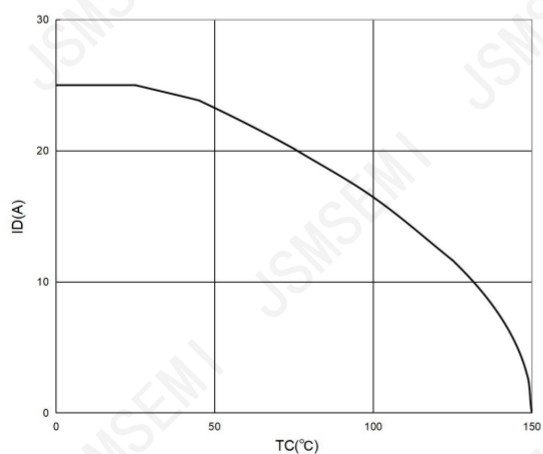


Figure 11: Current De-rating

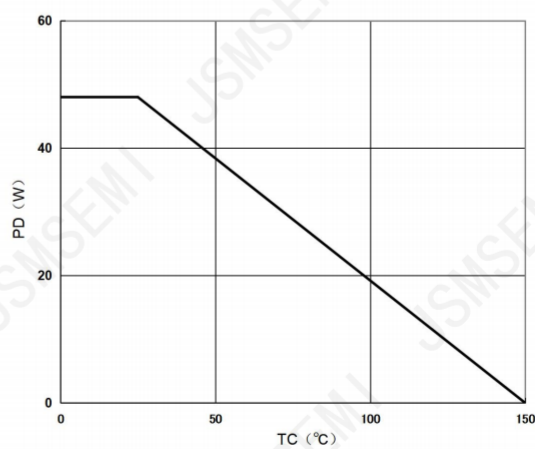


Figure 12: Power De-rating

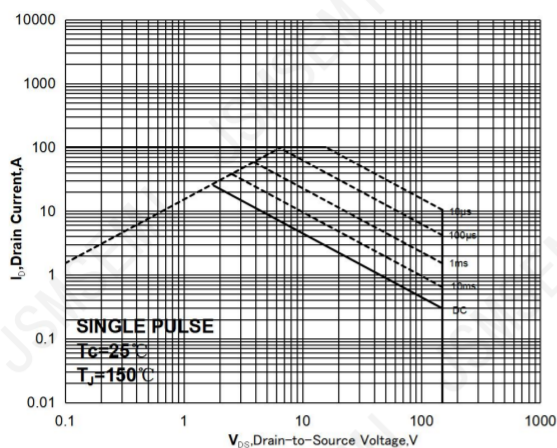


Figure 13. Safe Operating Area

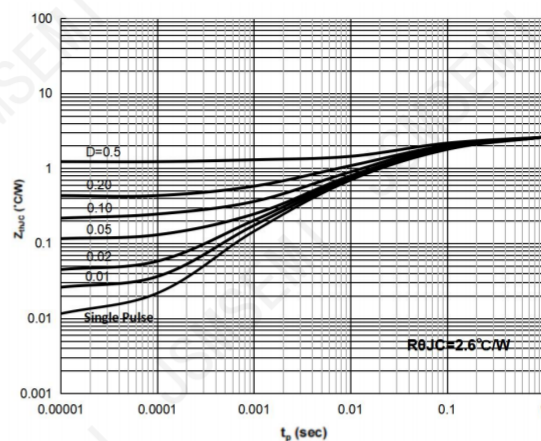
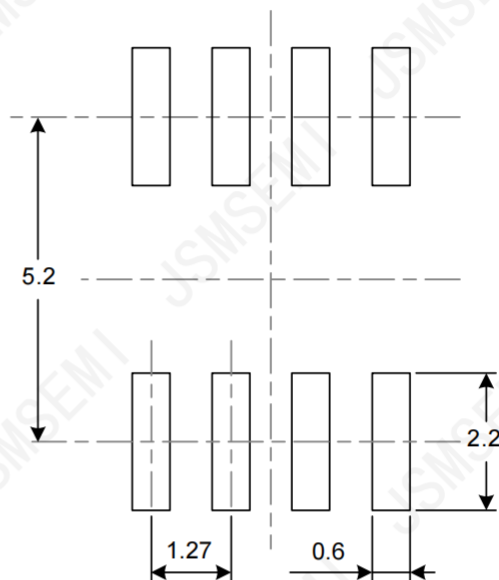
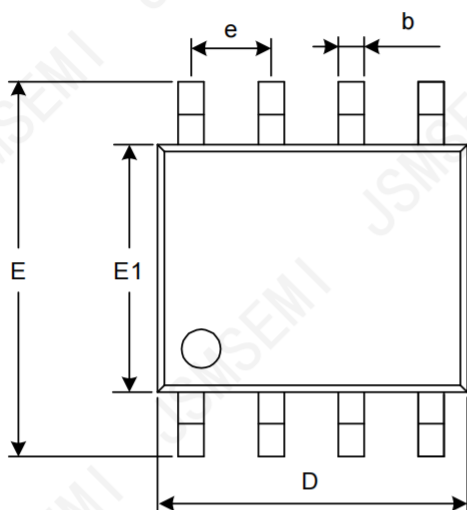


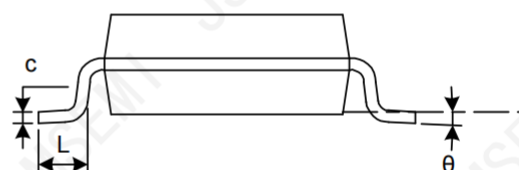
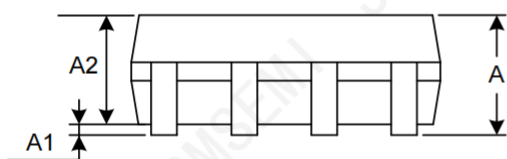
Figure 14. Normalized Maximum Transient Thermal Impedance

Package Information

SOIC-8



RECOMMENDED LAND PATTERN (Unit: mm)



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	0.007	0.010
D	4.800	5.000	0.189	0.197
e	1.270 (BSC)		0.050 (BSC)	
E	5.800	6.200	0.228	0.244
E1	3.800	4.000	0.150	0.157
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°

Revision History

Rev.	Change	Date
V1.0	Initial version	9/17/2021

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