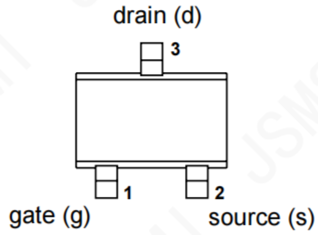
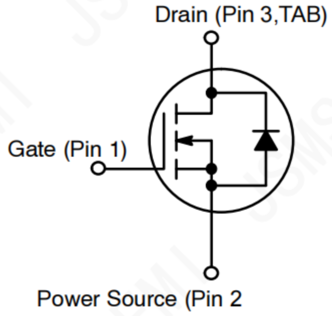
Product Summary

- V_{DS} 30V
- I_D 0.57A
- $R_{DS(ON)}$ (at V_{GS}=10V) <920mΩ
- 100% EAS Tested
- 100% ∇V_{DS} Tested



General Description

- Trench Power 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

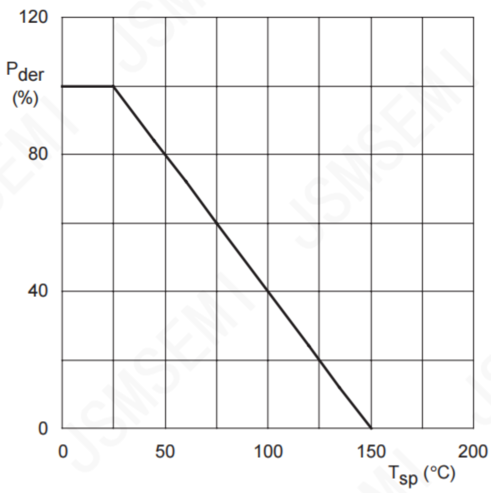
SOT-323

Absolute Maximum Rating System

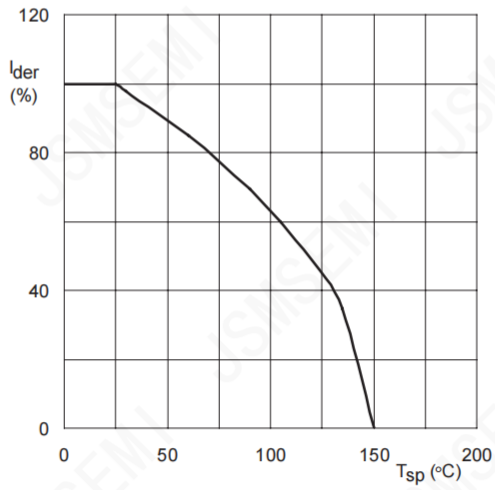
Symbol	Parameter	Conditions	Min	Max	Unit
V_{DS}	drain-source voltage (DC)	25 °C ≤ T_j ≤ 150 °C	-	30	V
V_{DGR}	drain-gate voltage (DC)	25 °C ≤ T_j ≤ 150 °C; R_{GS} = 20 kΩ	-	30	V
V_{GS}	gate-source voltage (DC)		-	±20	V
I_D	drain current (DC)	T_{sp} = 25 °C; V_{GS} = 10 V; Figure 2 and 3	-	0.57	A
		T_{sp} = 100 °C; V_{GS} = 10 V; Figure 2	-	0.36	A
I_{DM}	peak drain current	T_{sp} = 25 °C; pulsed; t_p ≤ 10 µs; Figure 3	-	1.15	A
P_{tot}	total power dissipation	T_{sp} = 25 °C; Figure 1	-	0.56	W
T_{stg}	storage temperature		–55	+150	°C
T_j	junction temperature		–55	+150	°C
Source-drain diode					
I_S	source (diode forward) current (DC)	T_{sp} = 25 °C	-	0.47	A
I_{SM}	peak source (diode forward current	T_{sp} = 25 °C; pulsed; t_p ≤ 10 µs	-	0.94	A

Characteristics T_j = 25 °C unless otherwise specified.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$V_{(BR)DSS}$	drain-source breakdown voltage	I_D = 250 µA; V_{GS} = 0 V				
		T_j = 25 °C	30	-	-	V
		T_j = –55 °C	55	-	-	V
$V_{GS(th)}$	gate-source threshold voltage	I_D = 0.25 mA; V_{DS} = V_{GS}; Figure 9				
		T_j = 25 °C	1	2	-	V
		T_j = 150 °C	0.6	-	-	V
		T_j = –55 °C	-	-	3.5	V
I_{DSS}	drain-source leakage current	V_{DS} = 30 V; V_{GS} = 0 V				
		T_j = 25 °C	-	0.05	1	µA
		T_j = 150 °C	-	-	100	µA
I_{GSS}	gate-source leakage current	V_{GS} = ±20 V; V_{DS} = 0 V	-	10	100	nA
R_{DSon}	drain-source on-state resistance	V_{GS} = 10 V; I_D = 0.3 A; Figure 7 and 8				
		T_j = 25 °C	-	780	920	mΩ
		T_j = 150 °C	-	1445	1700	mΩ
		V_{GS} = 4.5 V; I_D = 0.075 A; Figure 7 and 8	-	1100	1400	mΩ
$Q_{g(tot)}$	total gate charge	I_D = 1 A; V_{DD} = 30 V; V_{GS} = 10 V; Figure 13	-	1.05	-	nC
Q_{gs}	gate-source charge		-	0.2	-	nC
Q_{gd}	gate-drain (Miller) charge		-	0.22	-	nC
C_{iss}	input capacitance	V_{GS} = 0 V; V_{DS} = 30 V; f = 1 MHz; Figure 11	-	23	-	pF
C_{oss}	output capacitance		-	5	-	pF
C_{rss}	reverse transfer capacitance		-	3.5	-	pF
$t_{d(on)}$	turn-on delay time	V_{DD} = 30 V; R_L = 30 Ω; V_{GS} = 10 V; R_G = 6 Ω	-	2	-	ns
t_r	rise time		-	4	-	ns
$t_{d(off)}$	turn-off delay time		-	5	-	ns
t_f	fall time		-	2.2	-	ns
V_{SD}	source-drain (diode forward) voltage	I_S = 0.3 A; V_{GS} = 0 V; Figure 12	-	0.83	1.2	V



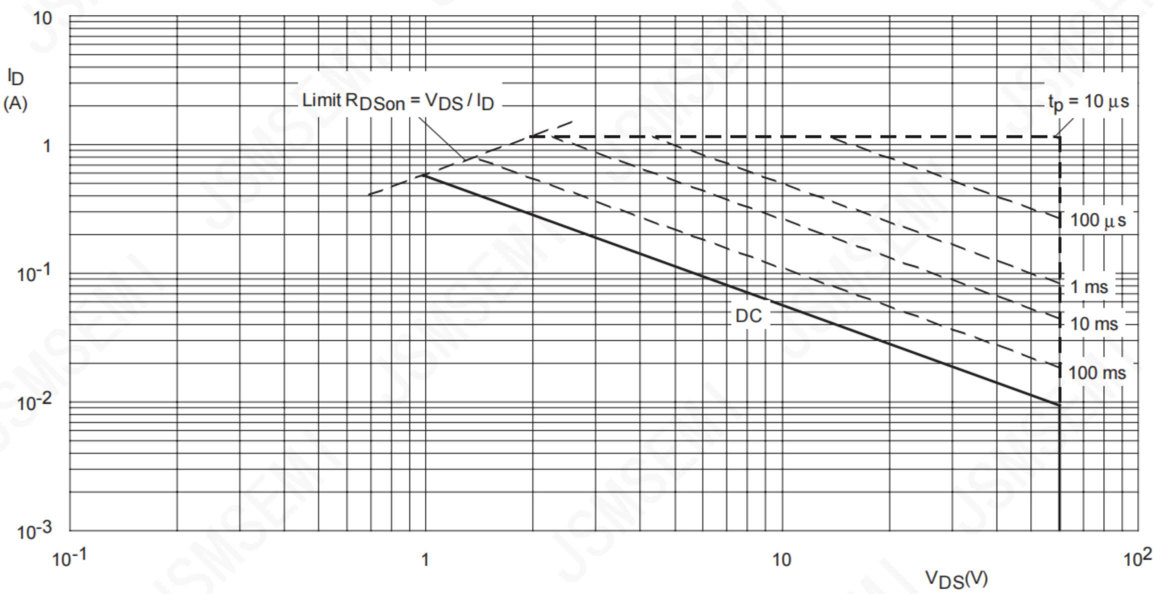
$$P_{der} = \frac{P_{tot}}{P_{tot(25^\circ C)}} \times 100\%$$



$$I_{der} = \frac{I_D}{I_{D(25^\circ C)}} \times 100\%$$

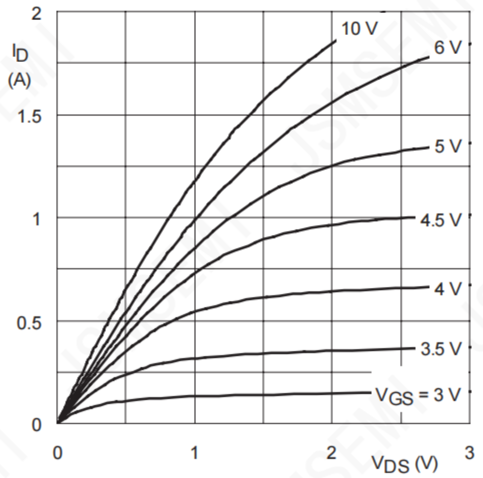
Fig 1. Normalized total power dissipation as a function of solder point temperature.

Fig 2. Normalized continuous drain current as a function of solder point temperature.



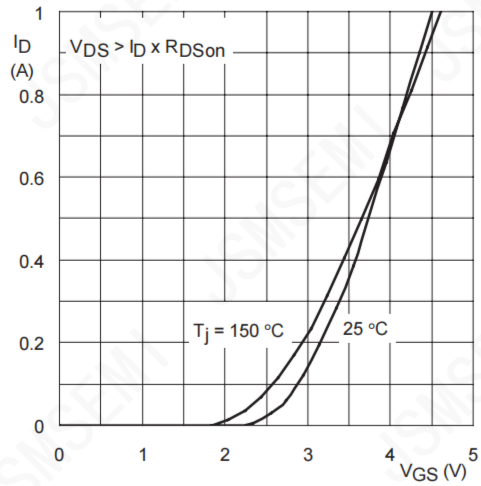
T_{sp} = 25 °C; I_{DM} is single pulse; V_{GS} = 10 V.

Fig 3. Safe operating area; continuous and peak drain currents as a function of drain-source voltage.



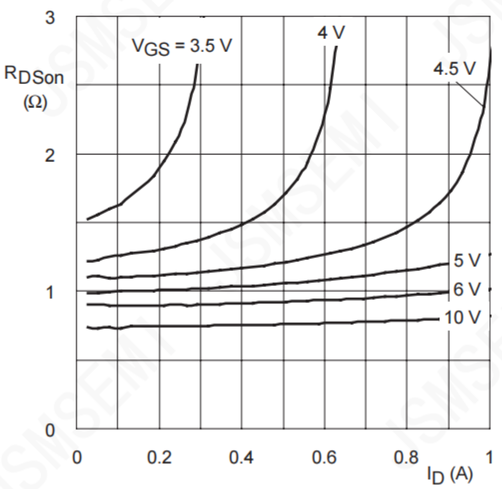
T_j = 25 °C

Fig 5. Output characteristics: drain current as a function of drain-source voltage; typical values.



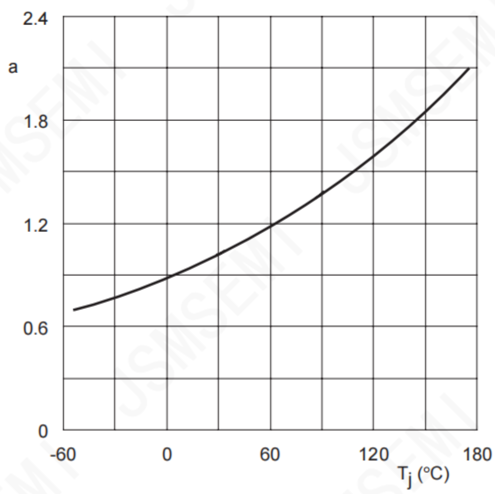
T_j = 25 °C and 150 °C; $V_{DS} > I_D \times R_{DSon}$

Fig 6. Transfer characteristics: drain current as a function of gate-source voltage; typical values.



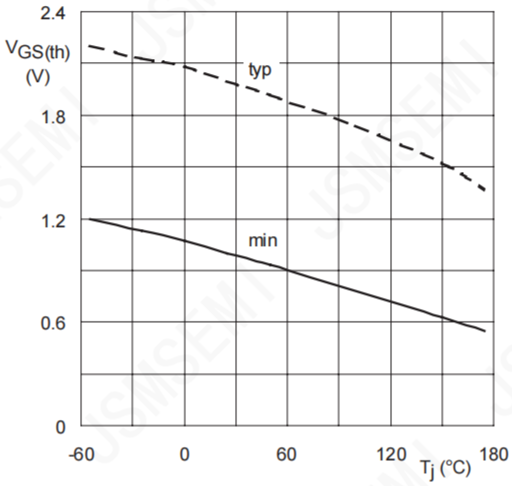
T_j = 25 °C

Fig 7. Drain-source on-state resistance as a function of drain current; typical values.



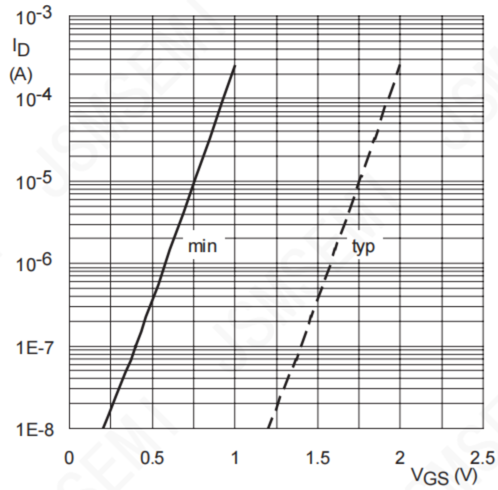
$$a = \frac{R_{DSon}}{R_{DSon(25°C)}}$$

Fig 8. Normalized drain-source on-state resistance factor as a function of junction temperature.



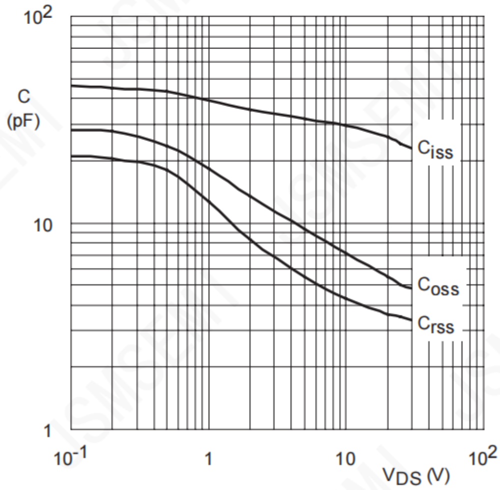
I_D = 0.25 mA; V_{DS} = V_{GS}

Fig 9. Gate-source threshold voltage as a function of junction temperature.



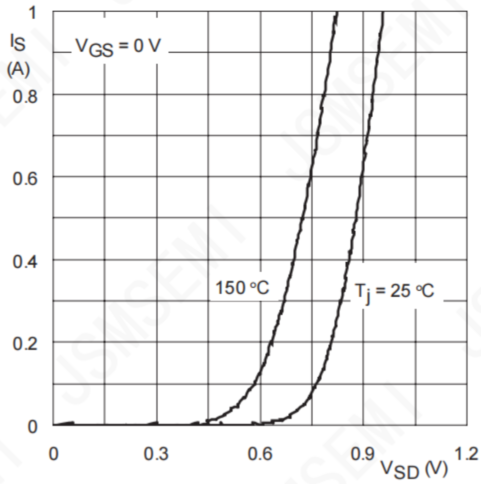
T_j = 25 °C; V_{DS} = 5 V

Fig 10. Sub-threshold drain current as a function of gate-source voltage.



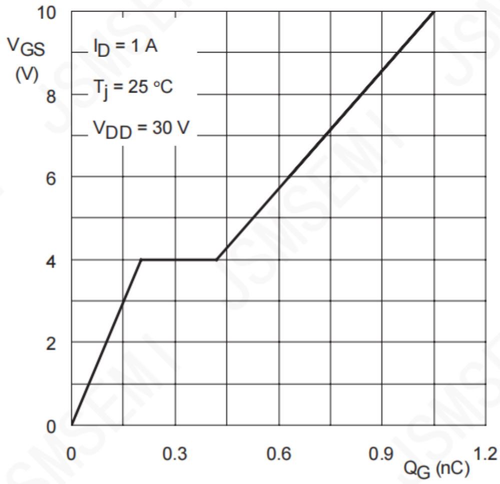
V_{GS} = 0 V; f = 1 MHz

Fig 11. Input, output and reverse transfer capacitances as a function of drain-source voltage; typical values.



T_j = 25 °C and 150 °C; V_{GS} = 0 V

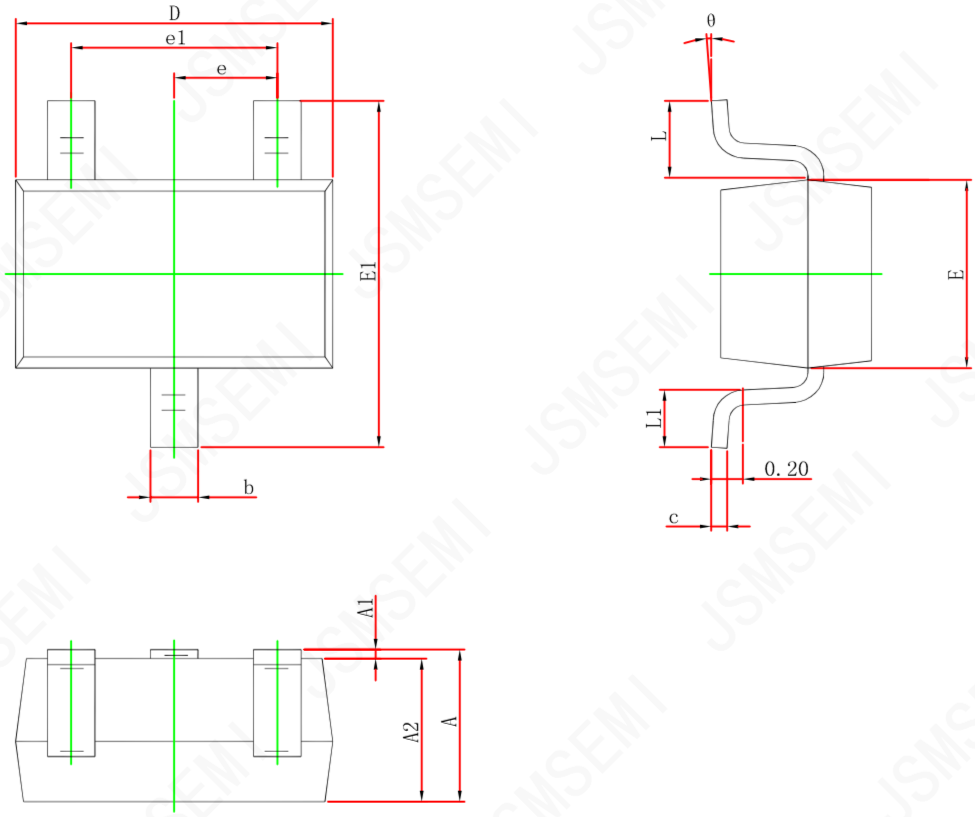
Fig 12. Source (diode forward) current as a function of source-drain (diode forward) voltage; typical values.



I_D = 1 A; V_{DD} = 30 V

Fig 13. Gate-source voltage as a function of gate charge; typical values.

SOT-323 PACKAGE OUTLINE DIMENSIONS



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.100	0.035	0.043
A1	0.000	0.100	0.000	0.004
A2	0.900	1.000	0.035	0.039
b	0.200	0.400	0.008	0.016
c	0.080	0.150	0.003	0.006
D	2.000	2.200	0.079	0.087
E	1.150	1.350	0.045	0.053
E1	2.150	2.450	0.085	0.096
e	0.650 TYP.		0.026 TYP.	
e1	1.200	1.400	0.047	0.055
L	0.525 REF.		0.021 REF.	
L1	0.260	0.460	0.010	0.018
θ	0°	8°	0°	8°

Revision History

Rev.	Change	Date
V1.0	Initial version	6/27/2021

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