

## SOT-23 Plastic-Encapsulate MOSFETS

### Features

- $V_{DSS}=20V$
- $I_D=4.5A$
- $R_{DS(on)}@VGS=4.5V < 25m\Omega$
- $R_{DS(on)}@VGS=2.5V < 32m\Omega$
- Trench Power LV MOSFET technology
- High density cell design for low  $R_{DS(ON)}$
- High Speed switching

**Drain-source Voltage**

20 V

**Drain Current**

4.5 Ampere

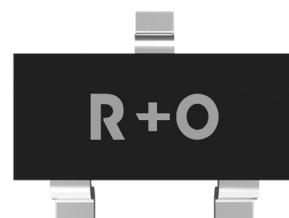
### Applications

- Battery protection
- Load switch
- Power management

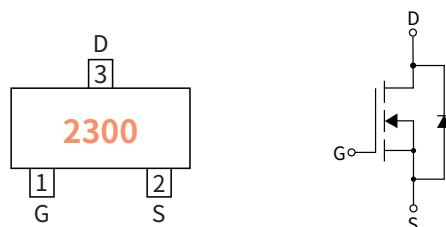
### Mechanical Data

- Case: SOT-23  
Molding compound meets UL 94V-0 flammability rating, RoHS-compliant, halogen-free
- Terminals: Solder plated, solderable per MIL-STD-750, Method 2026

**SOT-23**



### Function Diagram



### Maximum Ratings (Ta=25°C Unless otherwise specified)

PARAMETER		SYMBOL	UNIT	VALUE
Drain-source Voltage		$V_{DS}$	V	20
Gate-source Voltage		$V_{GS}$	V	$\pm 10$
Drain Current	Ta=25°C	$I_D$	A	4.5
	Ta=100°C			2.8
Pulsed Drain Current		$I_{DM}$	A	30
Total Power Dissipation	Ta=25°C	$P_D$	W	1
	Ta=100°C			0.4
Storage temperature	$T_{stg}$	°C	—	-55 ~ +150
Junction temperature	$T_j$	°C	—	-55 ~ +150
Thermal Resistance Junction-to-Ambient		$R_{\theta JA}$	°C / W	125

### Ordering Information

PACKAGE	PACKAGE CODE	UNIT WEIGHT(g)	REEL(pcs)	BOX(pcs)	CARTON(pcs)	DELIVERY MODE
SOT-23	R1	0.008	3000	45000	180000	7"

### ● Static Parameter Characteristics (Ta=25°C Unless otherwise specified)

PARAMETER	SYMBOL	Condition	UNIT	Min	Typ	Max
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	V <sub>GS</sub> =0V, I <sub>D</sub> =250μA	V	20	—	—
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =20V, V <sub>GS</sub> =0V	μA	—	—	1.0
Gate-Body Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> =±10V, V <sub>DS</sub> =0V	nA	—	—	±100
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	V	0.4	0.6	1
Static Drain-Source On-Resistance	R <sub>DS(ON)</sub>	V <sub>GS</sub> =4.5V, I <sub>D</sub> =4.5A	mΩ	—	20	25
		V <sub>GS</sub> =2.5V, I <sub>D</sub> =3A		—	25	32
		V <sub>GS</sub> =1.8V, I <sub>D</sub> =2.7A		—	33	46
Diode Forward Voltage	V <sub>SD</sub>	I <sub>S</sub> =4.5A, V <sub>GS</sub> =0V	V	—	0.9	1.2
Gate resistance	R <sub>G</sub>	f=1MHz, Open drain	Ω	—	2.7	—
Maximum Body-Diode Continuous Current	I <sub>S</sub>	—	A	—	—	4.5

### ● Dynamic Parameters (Ta=25°C Unless otherwise specified)

PARAMETER	SYMBOL	Condition	UNIT	Min	Typ	Max
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =10V V <sub>GS</sub> =0V f=1MHz	pF	—	418	—
Output Capacitance	C <sub>oss</sub>			—	82	—
Reverse Transfer Capacitance	C <sub>rss</sub>			—	70	—

### ● Switching Parameters (Ta=25°C Unless otherwise specified)

PARAMETER	SYMBOL	Condition	UNIT	Min	Typ	Max
Total Gate Charge	Q <sub>g</sub>	V <sub>GS</sub> =4.5V, V <sub>DS</sub> =10V, I <sub>D</sub> =4.5A	nC	—	6.06	—
Gate-Source Charge	Q <sub>gs</sub>			—	1.07	—
Gate-Drain Charge	Q <sub>gd</sub>			—	1.95	—
Reverse Recovery Charge	Q <sub>rr</sub>	I <sub>F</sub> =4.5A, di/dt=150A/us	nC	—	1.38	—
Reverse Recovery Time	t <sub>rr</sub>			—	17.9	—
Turn-on Delay Time	t <sub>D(on)</sub>	V <sub>GS</sub> =4.5V, V <sub>DS</sub> =10V, I <sub>D</sub> =4.5A R <sub>GEN</sub> =3Ω	ns	—	4.2	—
Turn-on Rise Time	t <sub>r</sub>			—	19.8	—
Turn-off Delay Time	t <sub>D(off)</sub>			—	22.6	—
Turn-off fall Time	t <sub>f</sub>			—	23.2	—

● Ratings And Characteristics Curves (Ta=25°C Unless otherwise specified)

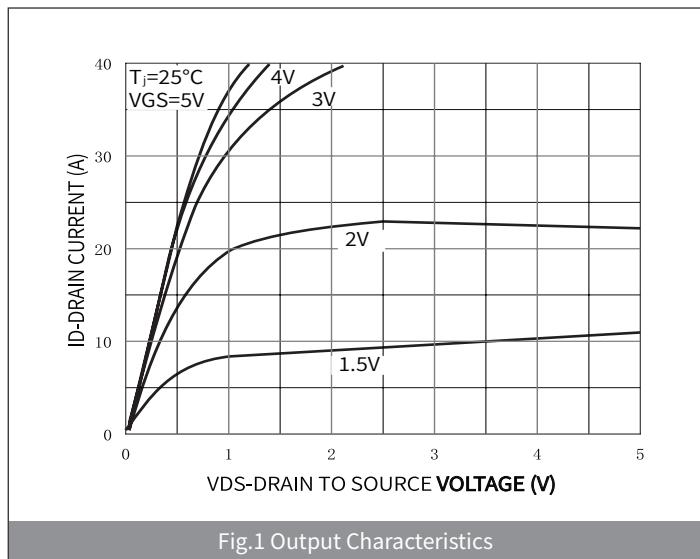


Fig.1 Output Characteristics

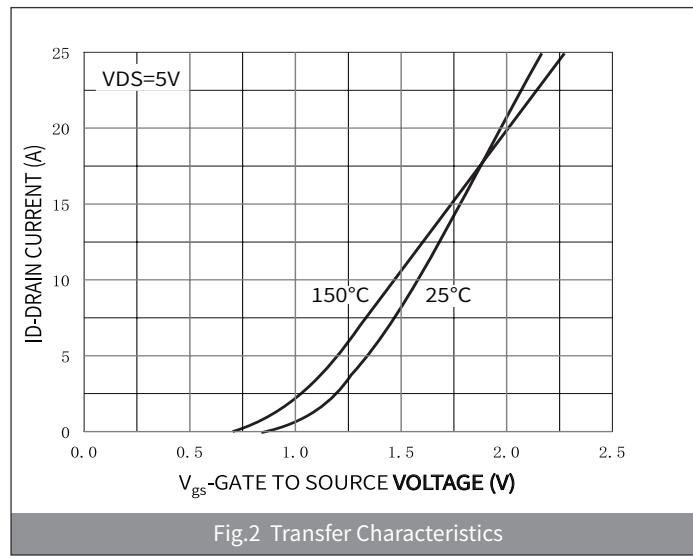


Fig.2 Transfer Characteristics

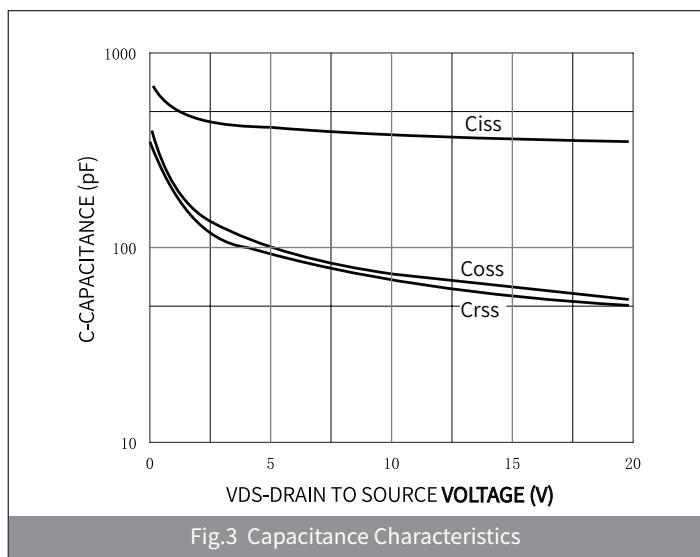


Fig.3 Capacitance Characteristics

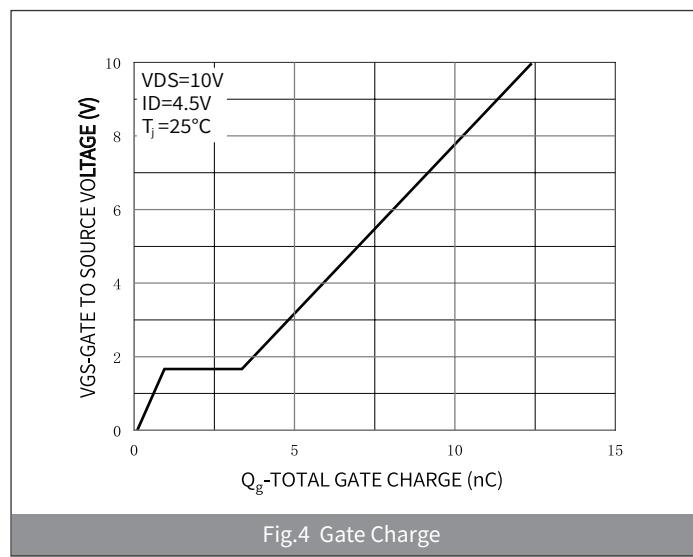


Fig.4 Gate Charge

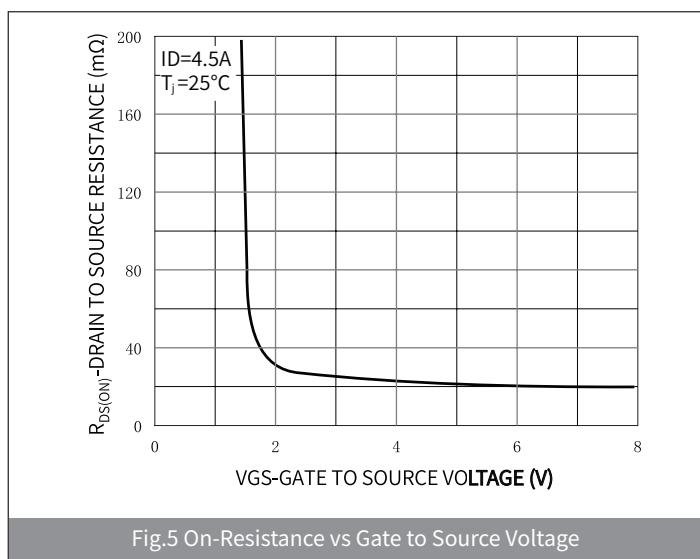


Fig.5 On-Resistance vs Gate to Source Voltage

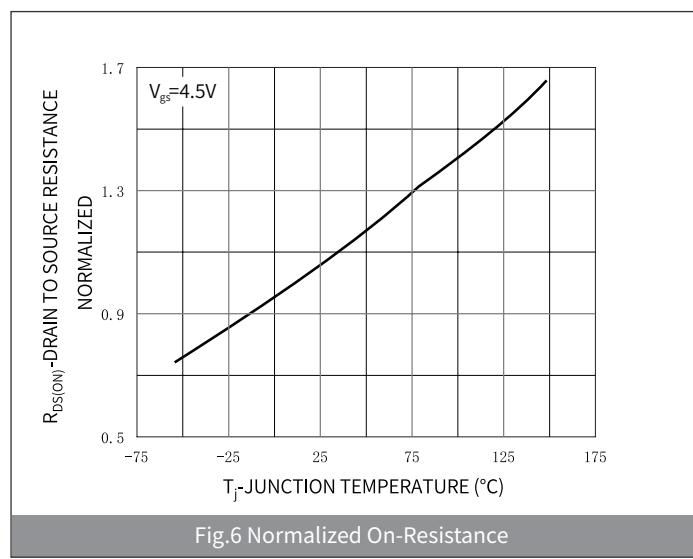


Fig.6 Normalized On-Resistance

### ● Ratings And Characteristics Curves (Ta=25°C Unless otherwise specified)

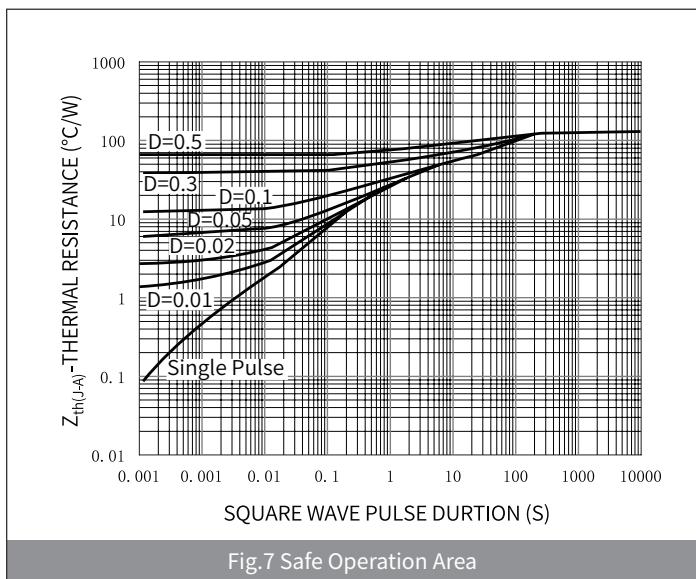


Fig.7 Safe Operation Area

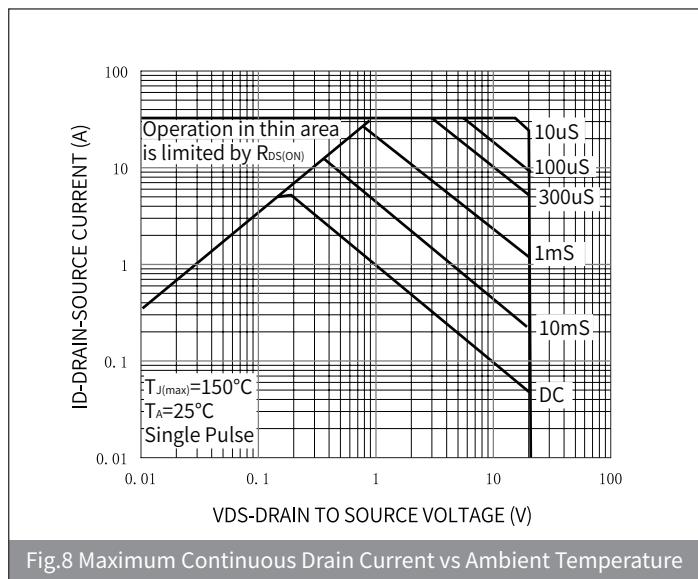
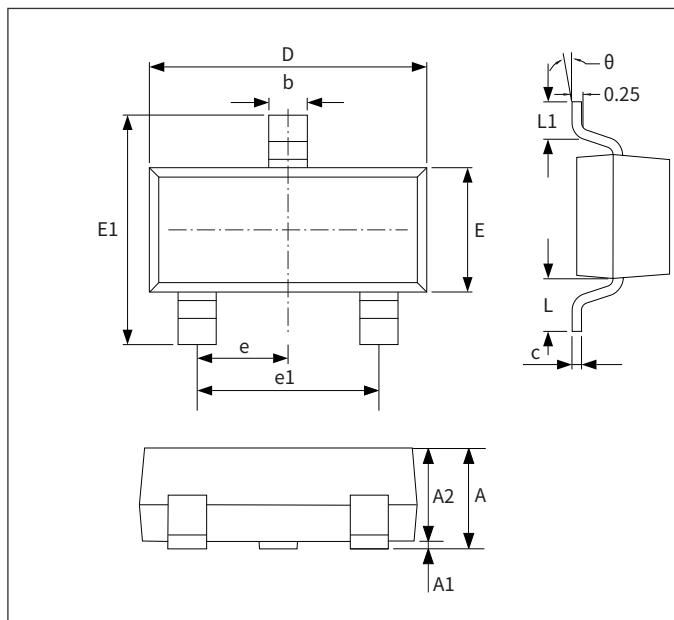


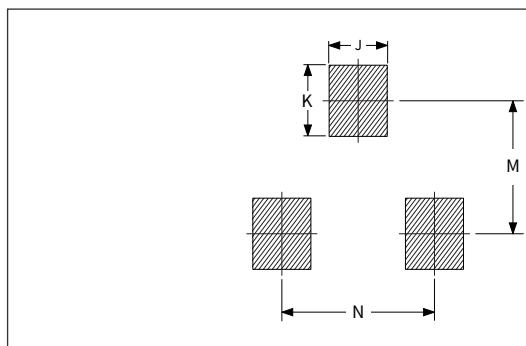
Fig.8 Maximum Continuous Drain Current vs Ambient Temperature

### ● Package Outline Dimensions (SOT-23)



Symbol	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	0.90	1.15	0.035	0.045
A1	-	0.10	-	0.004
A2	0.90	1.05	0.035	0.041
b	0.30	0.50	0.012	0.020
c	0.10	0.20	0.004	0.008
D	2.80	3.00	0.110	0.118
E	1.20	1.40	0.047	0.055
E1	2.25	2.55	0.089	0.100
e	0.950TYP		0.037TYP	
e1	1.80	2.00	0.071	0.079
L	0.550REF		0.022REF	
L1	0.30	0.50	0.012	0.020
θ	-	8°	-	8°

### ● Suggested Pad Layout



Symbol	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
J	0.75	0.85	0.030	0.033
K	0.85	0.95	0.033	0.037
M	1.95	2.05	0.077	0.081
N	1.85	1.95	0.073	0.077