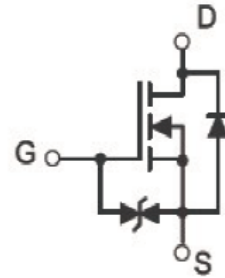


»Features

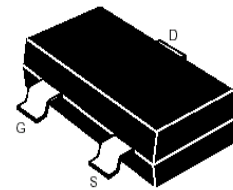
$V_{DS} = 60V$   
 $I_D = 0.3A$   
 $R_{DS(ON)} @ V_{GS} = 10V, \text{Max} = 2.3\Omega$   
 $R_{DS(ON)} @ V_{GS} = 4.5V, \text{Max} = 3\Omega$

»Pin Configurations



»General Description

- Super High dense cell design for extremely low RDS(ON)
- Reliable and Rugged.
- SOT-323 for Surface Mount Package.
- ESD Rating: >2000VHBM



SOT-323

»Absolute Maximum Ratings @ $T_A=25^\circ C$  unless otherwise noted

parameter		symbol	limit	unit
Drain-source voltage		$V_{DS}$	60	V
Gate-source voltage		$V_{GS}$	$\pm 20$	V
Continuous Drain Current ( $T_J = 150^\circ C$ )	$T_C=25^\circ C$	$I_D$	0.30	A
	$T_C=70^\circ C$		0.26	
	$T_A=25^\circ C$		0.34 <sup>b,c</sup>	
	$T_A=70^\circ C$		0.27 <sup>b,c</sup>	
Continuous Source-Drain Diode Current	$T_C=25^\circ C$	$I_S$	0.43	A
	$T_A=25^\circ C$		0.25 <sup>b,c</sup>	
Pulsed Drain Current ( $t = 300 \mu s$ )		$I_{DM}$	0.65	
Maximum power dissipation	$T_C=25^\circ C$	$P_D$	0.51	W
	$T_C=70^\circ C$		0.33	
	$T_A=25^\circ C$		0.30 <sup>b,c</sup>	
	$T_A=70^\circ C$		0.20 <sup>b,c</sup>	
Operating Junction and Storage Temperature Range		$T_J, T_{STG}$	-55—150	$^\circ C$

## »Thermal Characteristics

Parameter		Symbol	Typical	Maximum	Unit
Maximum Junction-to-Ambient <sup>b, d</sup>	$t \leq 5$ s	$R_{\theta JA}$	360	415	°C/W
Maximum Junction-to-Foot (Drain)	Steady State	$R_{\theta JF}$	300	350	

Notes:

- a. TC = 25 °C.
- b. Surface mounted on 1" x 1" FR4 board.
- c.  $t = 5$  s.
- d. Maximum under steady state conditions is 400 °C/W.

## »Electrical Characteristics @ $T_A=25^\circ\text{C}$ unless otherwise noted

Parameter	Symbol	Condition	Min	Typ	Max	Unit
<b>OFF Characteristics</b>						
Drain-source breakdown voltage	$BV_{DSS}$	$V_{GS}=0V, I_D=-250\mu A$	60	-	-	V
Zero gate voltage drain current	$I_{DSS}$	$V_{DS}=60V, V_{GS}=0V$	-	-	1	$\mu A$
Gate-body leakage	$I_{GSS}$	$V_{DS}=0V, V_{GS}=\pm 20V$	-	-	$\pm 10$	$\mu A$
<b>ON Characteristics</b>						
Gate threshold voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1	1.3	2.5	V
Drain-source on-state resistance <sup>a</sup>	$R_{DS(ON)}$	$V_{GS}=10V, I_D=0.30A$	-	1.8	2.3	$\Omega$
		$V_{GS}=4.5V, I_D=0.20A$	-	2.3	3	
Forward transconductance <sup>a</sup>	$g_{fs}$	$V_{DS}=30V, I_D=0.2A$	-	159	-	ms
<b>Dynamic Characteristics<sup>b</sup></b>						
Input capacitance	$C_{ISS}$	$V_{DS}=30V, V_{GS}=0V$ $f=1.0MHz$	-	18.5	-	pF
Output capacitance	$C_{OSS}$		-	7.5	-	
Reverse transfer capacitance	$C_{RSS}$		-	4.2	-	
<b>Switching Characteristics</b>						
Turn-on delay time	$t_{D(ON)}$	$V_{DD}=30V$ $I_D=0.3A$ $V_{GEN}=10V$ $R_L=100\Omega$ $R_{GEN}=1\Omega$	-	6.5	-	ns
Rise time	$t_r$		-	12	-	
Turn-off delay time	$t_{D(OFF)}$		-	13	-	
Fall time	$t_f$		-	14	-	
Total gate charge	$Q_g$	$V_{DS}=30V, I_D=0.30A$ $V_{GS}=4.5V$	-	0.5	-	nC
Gate-source charge	$Q_{gs}$		-	0.2	-	
Gate-drain charge	$Q_{gd}$		-	0.15	-	
<b>DRAIN-SOURCE DIODE CHARACTERISTICS</b>						
Diode forward voltage	$V_{SD}$	$V_{GS}=0V, I_S=0.3A$	-	-0.8 1	-1.2	V

Notes:

- a. Pulse test: Pulse width  $\leq 300 \mu s$ , duty cycle  $\leq 2\%$
- b. Guaranteed by design, not subject to production testing

» **Electrical Characteristics** @ $T_A=25^{\circ}\text{C}$  unless otherwise noted

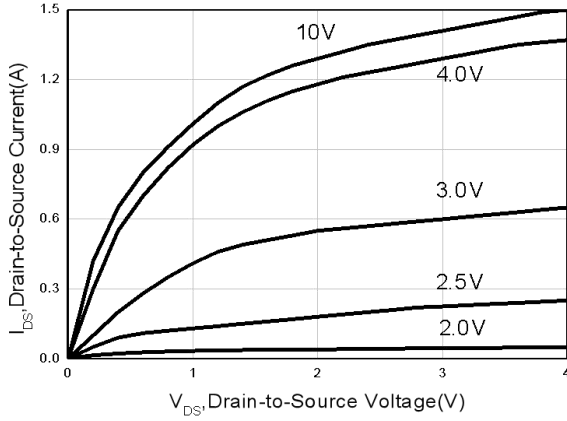


Figure1. Output Characteristics

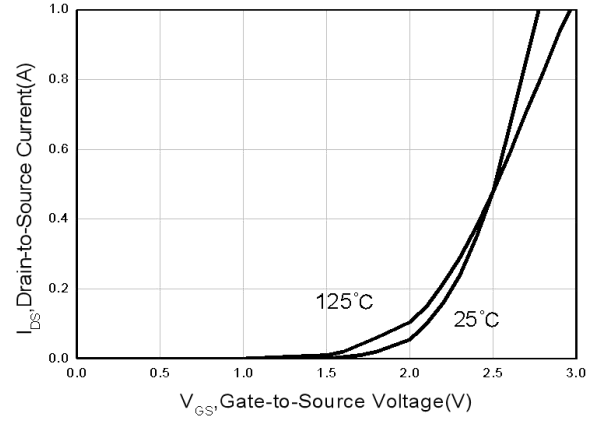


Figure2. Transfer Characteristics

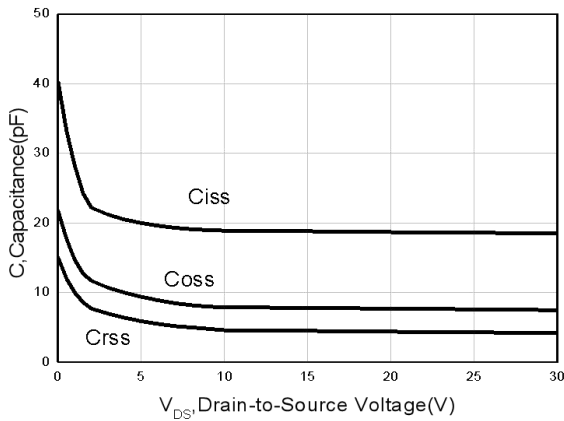


Figure3. Capacitance Characteristics

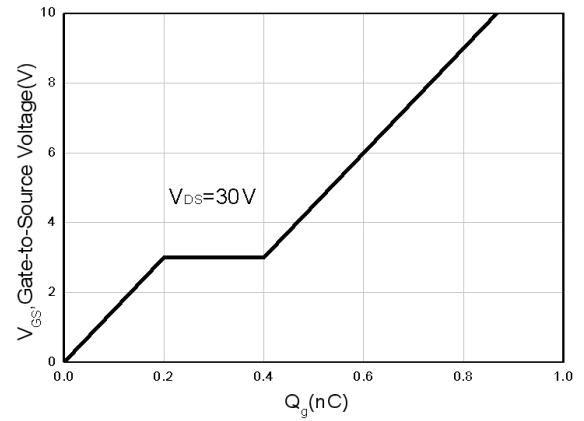


Figure4. Gate Charge

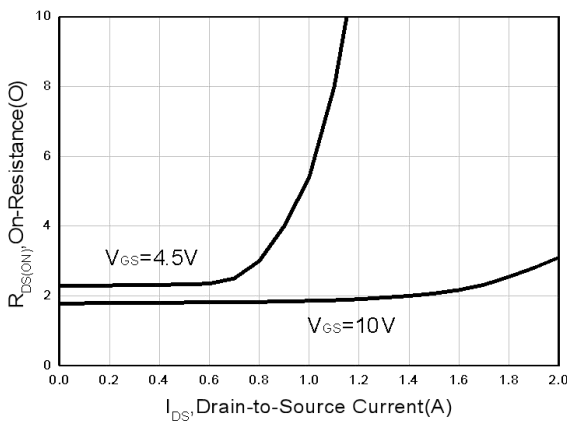


Figure5. Drain-Source on Resistance

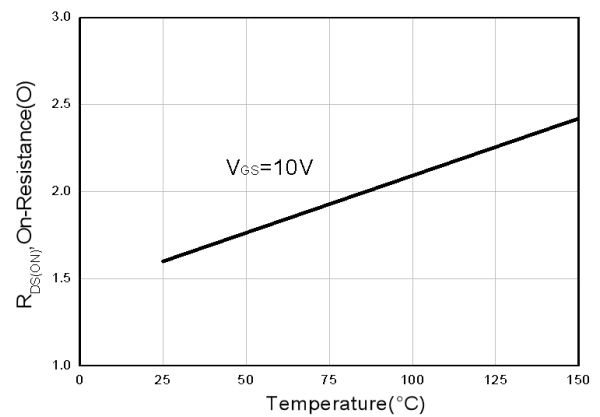
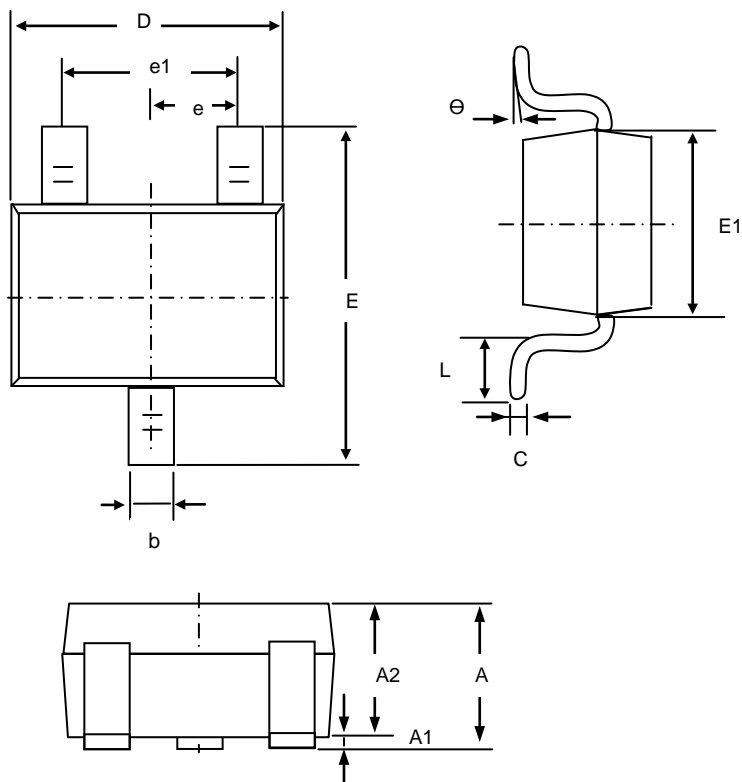


Figure6. Drain-Source on Resistance

»Package Information

SOT-323



Symbol	Dim in mm		
	Min	Nor	Max
A	0.90	1.00	1.10
A1	0.00	0.05	0.10
A2	0.90	0.95	1.00
b	0.20	0.30	0.40
c	0.08	0.12	0.15
D	2.00	2.10	2.20
E	2.15	2.30	2.45
E1	1.15	1.25	1.35
e	0.650TPY.		
e1	1.2	1.3	1.4
L	0.26	0.36	0.46
$\theta$	0°	4°	8°

»Ordering information

Order code	Package	Marking	Base qty	Delivery mode
2N7002KW	SOT-323	K72	3K	Tape and reel

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