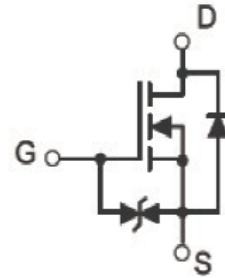


»Features

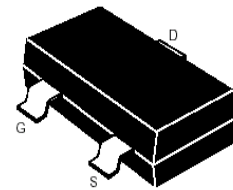
$V_{DS} = 60V$
 $I_D = 0.3A$
 $R_{DS(ON)} @ V_{GS} = 10V, \text{Max} = 2.3\Omega$
 $R_{DS(ON)} @ V_{GS} = 4.5V, \text{Max} = 3\Omega$

»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}	± 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 ^{b,c}	
	$T_A=70^\circ C$		0.27 ^{b,c}	
Continuous Source-Drain Diode Current	$T_C=25^\circ C$	I_S	0.43	A
	$T_A=25^\circ C$		0.25 ^{b,c}	
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 ^{b,c}	
	$T_A=70^\circ C$		0.20 ^{b,c}	
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 ^{b, d}	$t \leq 5$ 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
OFF Characteristics						
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	μA
Gate-body leakage	I_{GSS}	$V_{DS}=0V, V_{GS}=\pm 20V$	-	-	± 10	μA
ON Characteristics						
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 ^a	$R_{DS(ON)}$	$V_{GS}=10V, I_D=0.30A$	-	1.8	2.3	Ω
		$V_{GS}=4.5V, I_D=0.20A$	-	2.3	3	
Forward transconductance ^a	g_{fs}	$V_{DS}=30V, I_D=0.2A$	-	159	-	ms
Dynamic Characteristics^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	-	
Switching Characteristics						
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	-	
DRAIN-SOURCE DIODE CHARACTERISTICS						
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

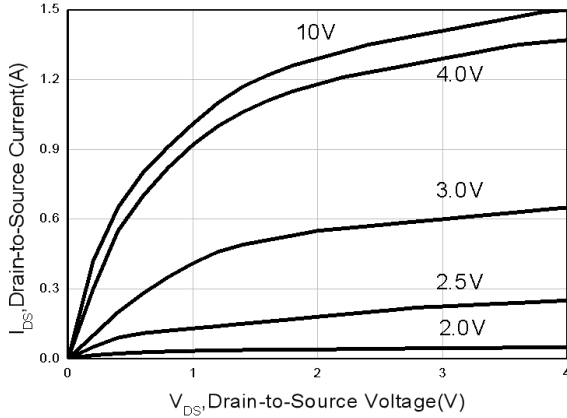


Figure1. Output Characteristics

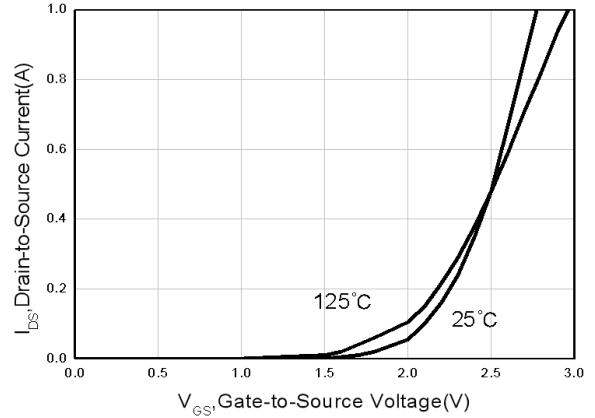


Figure2. Transfer Characteristics

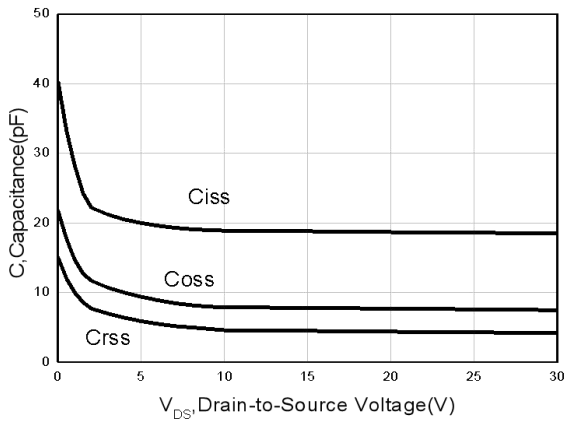


Figure3. Capacitance Characteristics

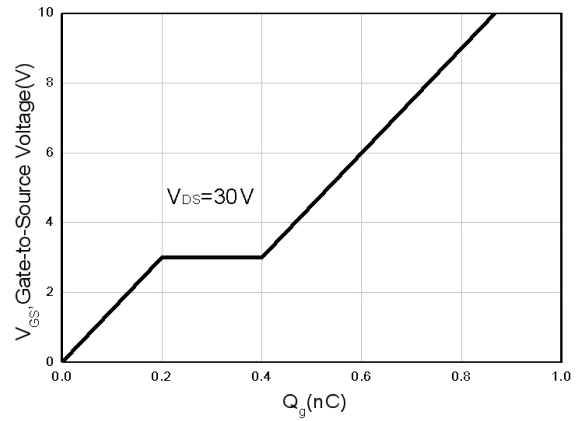


Figure4. Gate Charge

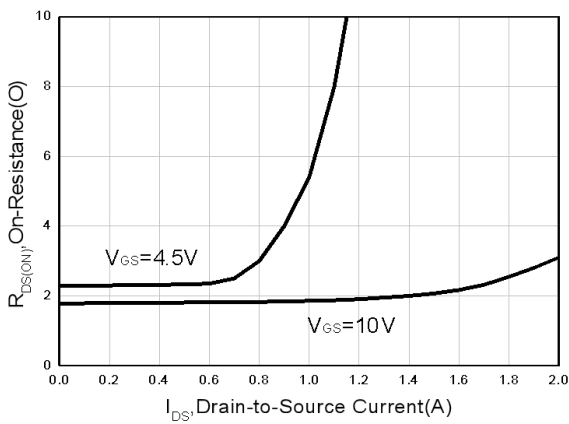


Figure5. Drain-Source on Resistance

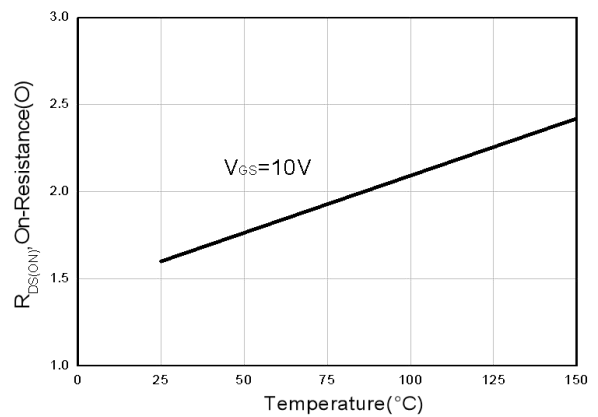
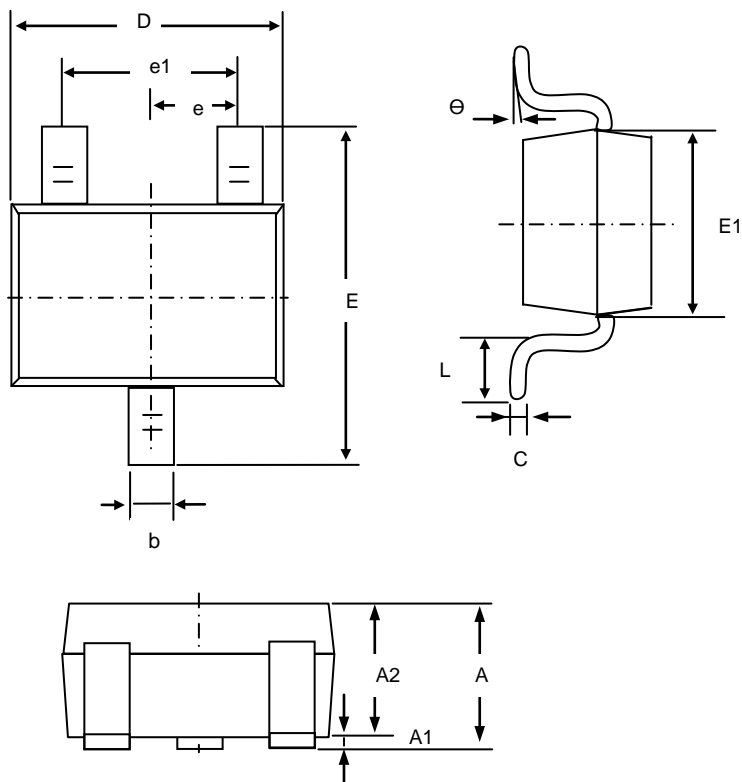


Figure6. Drain-Source on Resistance

»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
θ	0°	4°	8°

»Ordering information

Order code	Package	Marking	Base qty	Delivery mode
2N7002KW	SOT-323	72K	3K	Tape and reel