

## Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	$I_D$
30V	42mΩ@10V	4.2A
	48mΩ@4.5V	
	55mΩ@2.5V	

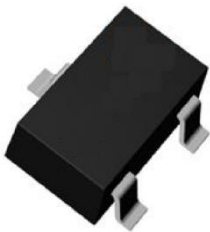
## Feature

- Advanced trench cell design
- ESD protected

## Application

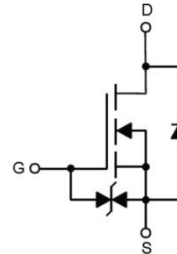
- Specially designed for switch load
- PWM application

## Package

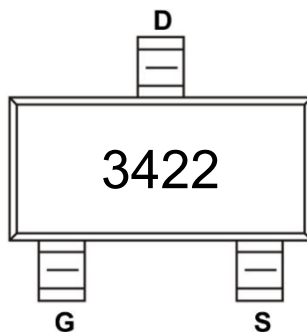


SOT-23

## Circuit diagram



## Marking



### Absolute maximum ratings ( $T_A=25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	$V_{DS}$	30	V
Gate-Source Voltage	$V_{GS}$	$\pm 12$	V
Continuous Drain Current	$I_D$	4.2	A
Pulsed Drain Current	$I_{DM}$	16.8	A
Single Pulse Avalanche Energy <sup>1)</sup>	$E_{AS}$	4.5	mJ
Power Dissipation <sup>2)</sup>	$P_D$	1.25	W
Thermal Resistance Junction to Ambient <sup>2)</sup>	$R_{\theta JA}$	100	$^{\circ}\text{C}/\text{W}$
Operating Junction Temperature	$T_J$	-55 ~ +150	$^{\circ}\text{C}$
Storage Temperature	$T_{STG}$	-55 ~ +150	$^{\circ}\text{C}$

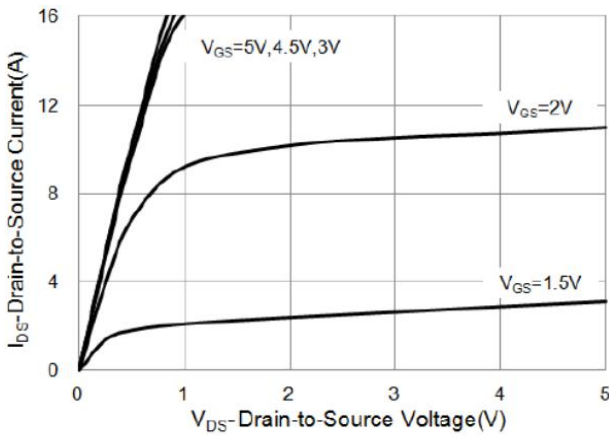
### Electrical characteristics ( $T_A=25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
<b>Static Characteristics</b>						
Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS} = 0\text{V}, I_D = 250\mu\text{A}$	30			V
Zero gate voltage drain current	$I_{DSS}$	$V_{DS} = 24\text{V}, V_{GS} = 0\text{V}$			1	$\mu\text{A}$
Gate-body leakage current	$I_{GSS}$	$V_{DS} = 0\text{V}, V_{GS} = \pm 10\text{V}$			$\pm 10$	$\mu\text{A}$
Gate threshold voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu\text{A}$	0.3	0.7	1.3	V
Drain-source on-resistance <sup>3)</sup>	$R_{DS(on)}$	$V_{GS} = 10\text{V}, I_D = 4.2\text{A}$			42	m $\Omega$
		$V_{GS} = 4.5\text{V}, I_D = 3.5\text{A}$			48	
		$V_{GS} = 2.5\text{V}, I_D = 2.8\text{A}$			55	
<b>Dynamic characteristics<sup>4)</sup></b>						
Input Capacitance	$C_{iss}$	$V_{DS} = 15\text{V}, V_{GS} = 0\text{V}, f = 1\text{MHz}$		421		pF
Output Capacitance	$C_{oss}$			43		
Reverse Transfer Capacitance	$C_{rss}$			35		
Total Gate Charge	$Q_g$	$V_{DS} = 15\text{V}, V_{GS} = 4.5\text{V}, I_D = 4.2\text{A}$		5.1		nC
Gate-Source Charge	$Q_{gs}$			0.8		
Gate-Drain Charge	$Q_{gd}$			1.4		
Turn-on delay time	$t_{d(on)}$	$V_{DS} = 15\text{V}, V_{GS} = 10\text{V}, I_D = 1\text{A}$ $R_G = 3\Omega$		11		nS
Turn-on rise time	$t_r$			7.4		
Turn-off delay time	$t_{d(off)}$			35		
Turn-off fall time	$t_f$			9.1		
<b>Source-Drain Diode characteristics</b>						
Diode Forward Current	$I_S$				4.2	A
Diode Forward voltage <sup>3)</sup>	$V_{SD}$	$V_{GS} = 0\text{V}, I_S = 1\text{A}$			1.2	V

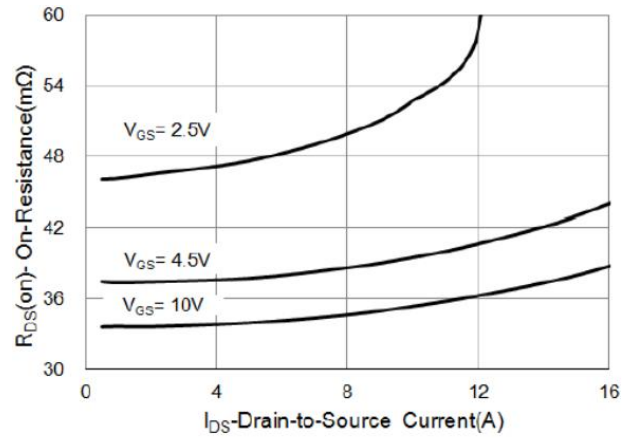
Notes:

- 1) The EAS test condition is  $V_{DD} = 20\text{V}, L = 0.5\text{mH}, V_{GS} = 6\text{V}$ , Starting  $T_J = 25^{\circ}\text{C}$
- 2) The data tested by surface mounted on a 1 inch<sup>2</sup> FR-4 board with 2OZ copper.
- 3) The data tested by pulsed, pulse width  $\leq 300\mu\text{s}$ , duty cycle  $\leq 2\%$ .
- 4) Guaranteed by design, not subject to production testing.

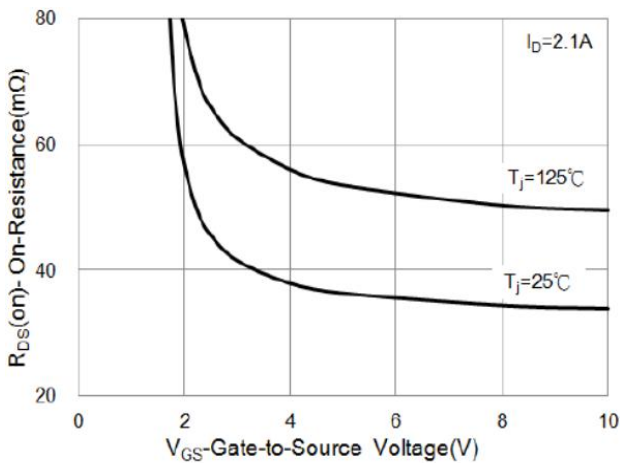
## Typical Characteristics



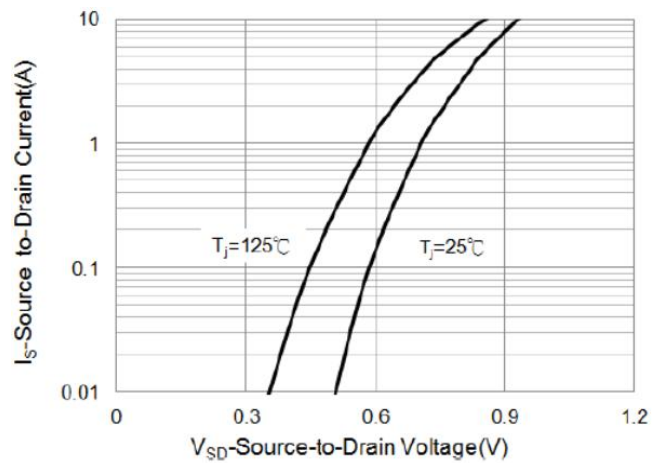
**Fig 1 On-Region Characteristics**



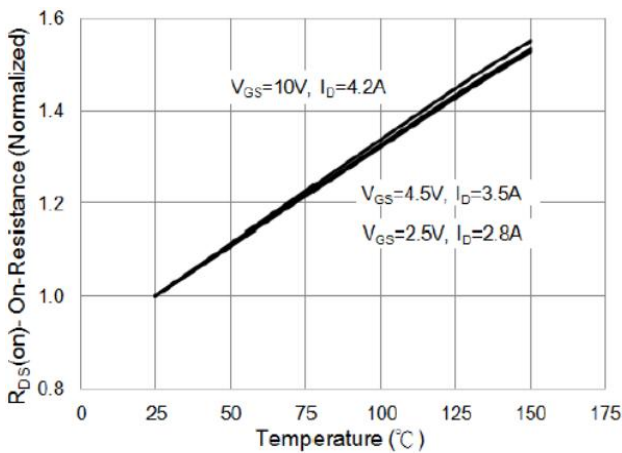
**Fig 2 On-Resistance vs. Drain Current and Gate Voltage**



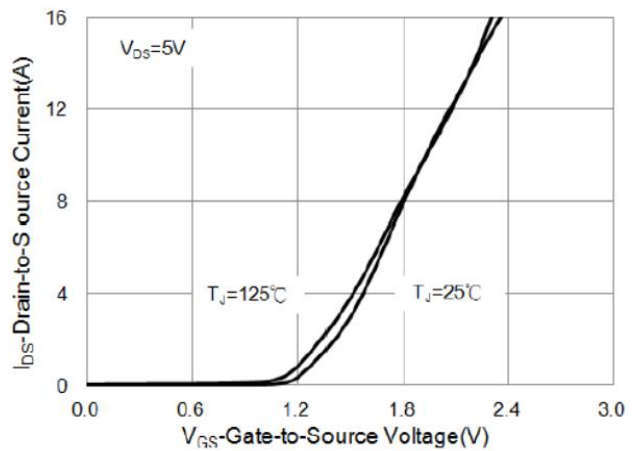
**Fig 3 On-Resistance vs. Gate-Source Voltage**



**Fig 4 Body-Diode Characteristics**

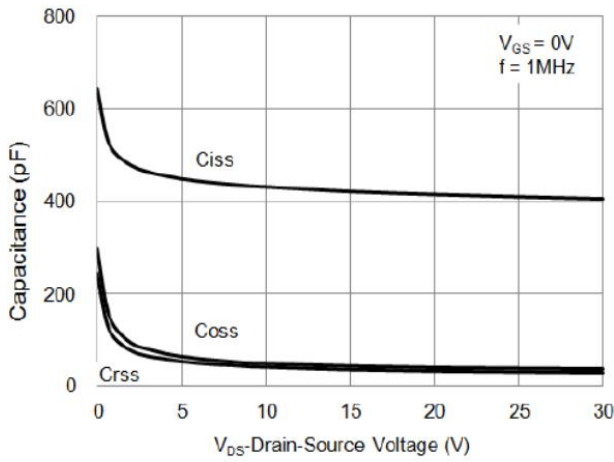


**Fig 5 On-Resistance vs. Junction Temperature**

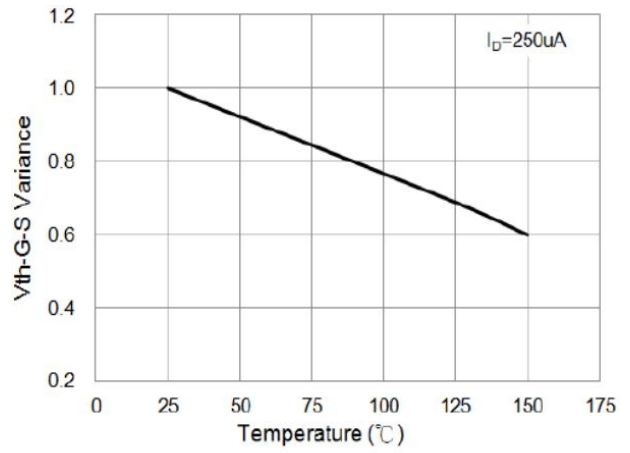


**Fig 6 Transfer Characteristics**

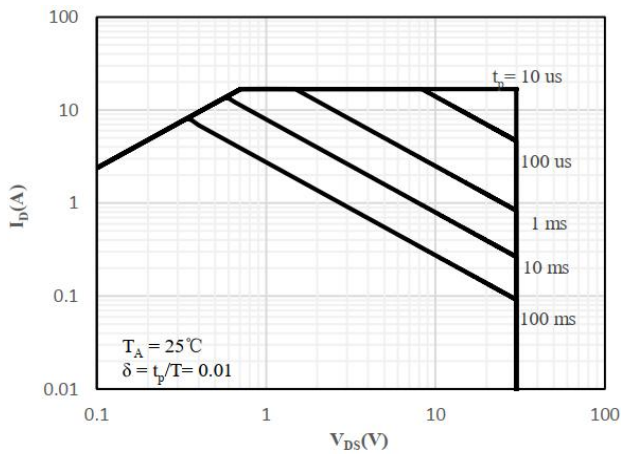
## Typical Characteristics



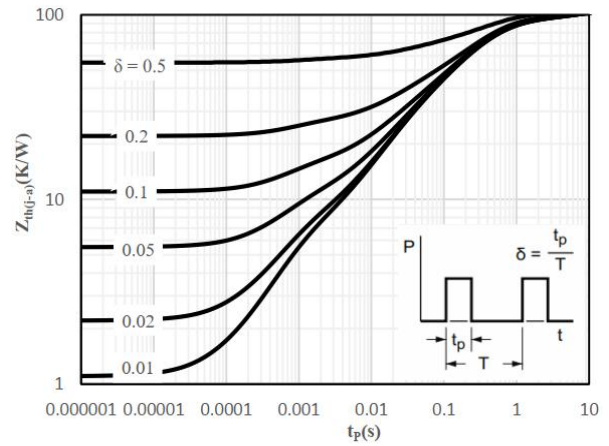
**Fig 7 Capacitance Characteristics**



**Fig 8 Gate Voltage vs. Junction Temperature**

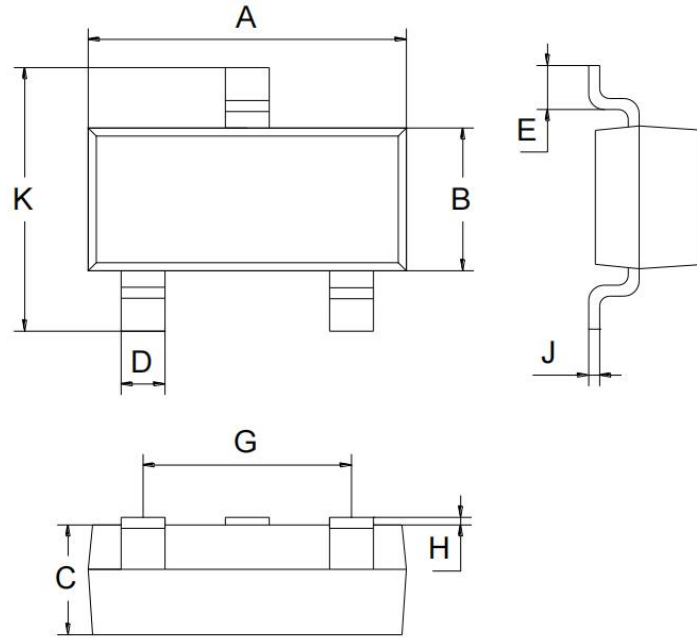


**Fig 9 Safe Operation Area**



**Fig 10 Maximum transient thermal impedance**

## SOT-23 Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.700	3.100	0.106	0.122
B	1.100	1.500	0.043	0.059
C	0.900	1.100	0.035	0.043
D	0.300	0.500	0.012	0.020
E	0.350	0.480	0.014	0.019
G	1.800	2.000	0.071	0.079
H	0.020	0.100	0.001	0.004
J	0.050	0.150	0.002	0.006
K	2.200	2.600	0.087	0.102