

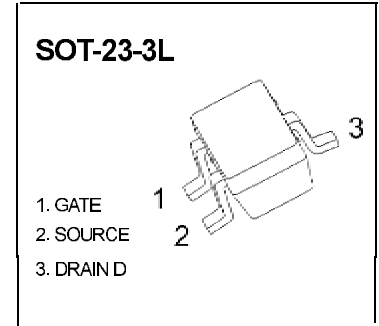


DONGGUAN NANJING ELECTRONICS LTD.,

## SOT-23-3L Plastic-Encapsulate MOSFETS

**K2305** P-Channel 8-V(D-S) MOSFET

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	$I_D$
-12V	45m $\Omega$ @-4.5V	-4.1A
	60m $\Omega$ @-2.5V	
	90m $\Omega$ @-1.8V	



### FEATURE

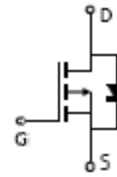
TrenchFET Power MOSFET

### APPLICATIONS

- Load Switch for Portable Devices
- DC/DC Converter

**MARKING:** A50TF

### Equivalent Circuit



Solid dot = Green molding compound device,  
if none, the normal device.

### Maximum ratings ( $T_a=25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	$V_{DS}$	-12	V
Gate-Source Voltage	$V_{GS}$	$\pm 8$	
Continuous Drain Current	$I_D$	-4.1	A
Continuous Source-Drain Diode Current	$I_S$	-0.8	
Maximum Power Dissipation	$P_D$	0.4	W
Thermal Resistance from Junction to Ambient( $t \leq 10s$ )	$R_{\theta JA}$	312.5	$^\circ\text{C/W}$
Junction Temperature	$T_J$	150	$^\circ\text{C}$
Storage Temperature	$T_{STG}$	-50 ~ +150	

## MOSFET ELECTRICAL CHARACTERISTICS

$T_a=25^\circ\text{C}$  unless otherwise specified

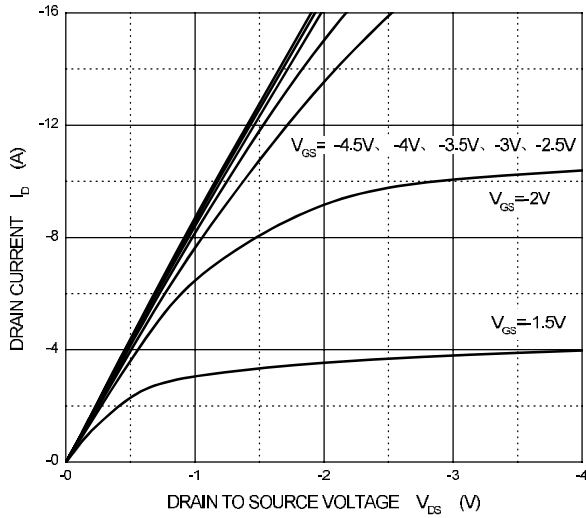
Parameter	Symbol	Test Condition	Min	Typ	Max	Units
<b>Static</b>						
Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = -250\mu A$	-12			V
Gate-source threshold voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250\mu A$	-0.5		-0.9	
Gate-source leakage	$I_{GSS}$	$V_{DS} = 0V, V_{GS} = \pm 8V$			$\pm 100$	nA
Zero gate voltage drain current	$I_{DSS}$	$V_{DS} = -8V, V_{GS} = 0V$			-1	$\mu A$
Drain-source on-state resistance <sup>a</sup>	$R_{DS(on)}$	$V_{GS} = -4.5V, I_D = -3.5A$		30	45	m $\Omega$
		$V_{GS} = -2.5V, I_D = -3A$		40	60	
		$V_{GS} = -1.8V, I_D = -2.0A$		60	90	
Forward transconductance <sup>a</sup>	$g_{fs}$	$V_{DS} = -5V, I_D = -4.1A$	6			S
<b>Dynamic</b>						
Input capacitance <sup>b,c</sup>	$C_{iss}$	$V_{DS} = -4V, V_{GS} = 0V, f = 1MHz$		740		pF
Output capacitance <sup>b,c</sup>	$C_{oss}$			290		
Reverse transfer capacitance <sup>b,c</sup>	$C_{rss}$			190		
Total gate charge <sup>b</sup>	$Q_g$	$V_{DS} = -4V, V_{GS} = -4.5V, I_D = -4.1A$		7.8	15	nC
		$V_{DS} = -4V, V_{GS} = -2.5V, I_D = -4.1A$		4.5	9	
Gate-source charge <sup>b</sup>	$Q_{gs}$	$V_{DS} = -4V, V_{GS} = -2.5V, I_D = -4.1A$		1.2		
Gate-drain charge <sup>b</sup>	$Q_{gd}$			1.6		
Gate resistance <sup>b,c</sup>	$R_g$	$f = 1MHz$	1.4	7	14	$\Omega$
Turn-on delay time <sup>b,c</sup>	$t_{d(on)}$	$V_{DD} = -4V, R_L = 1.2\Omega, I_D \approx -3.3A, V_{GEN} = -4.5V, R_g = 1\Omega$		13	20	ns
Rise time <sup>b,c</sup>	$t_r$			35	53	
Turn-off Delay time <sup>b,c</sup>	$t_{d(off)}$			32	48	
Fall time <sup>b,c</sup>	$t_f$			10	20	
Turn-on delay time <sup>b,c</sup>	$t_{d(on)}$	$V_{DD} = -4V, R_L = 1.2\Omega, I_D \approx -3.3A, V_{GEN} = -8V, R_g = 1\Omega$		5	10	
Rise time <sup>b,c</sup>	$t_r$			11	17	
Turn-off delay time <sup>b,c</sup>	$t_{d(off)}$			22	33	
Fall time <sup>b,c</sup>	$t_f$			16	24	
<b>Drain-source body diode characteristics</b>						
Continuous source-drain diode current	$I_S$	$T_C = 25^\circ C$			-1.4	A
Pulse diode forward current <sup>a</sup>	$I_{SM}$				-10	
Body diode voltage	$V_{SD}$	$I_F = -3.3A$			-1.2	V

**Note :**

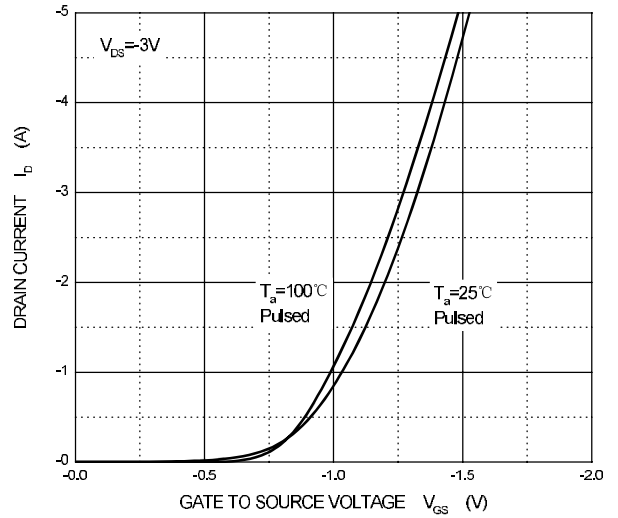
- a. Pulse Test ; Pulse Width  $\leq 300\mu s$ , Duty Cycle  $\leq 2\%$ .
- b. Guaranteed by design, not subject to production testing.
- c. These parameters have no way to verify.

# Typical Characteristics

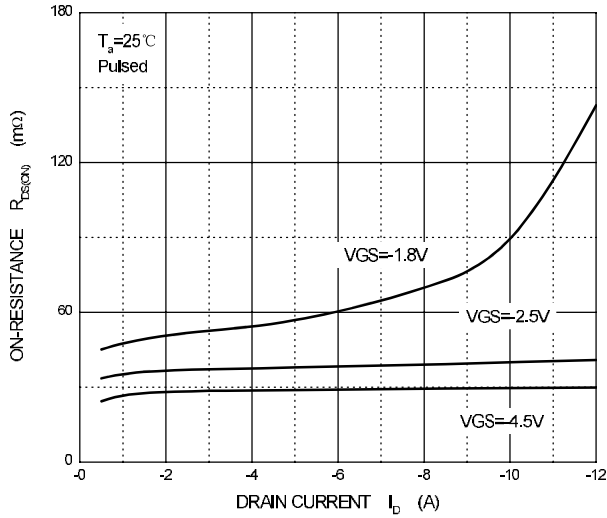
Output Characteristics



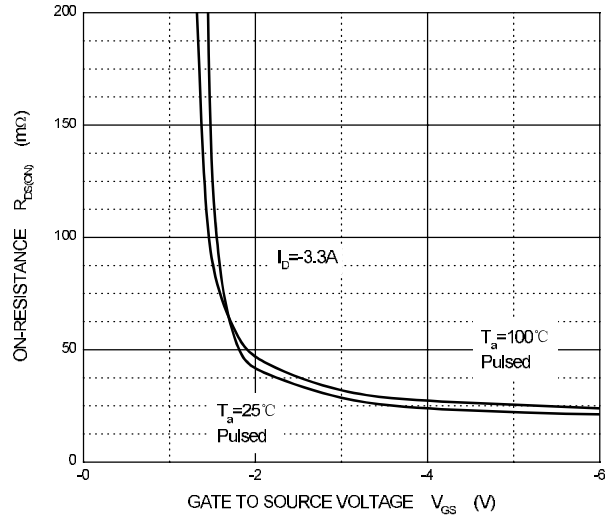
Transfer Characteristics



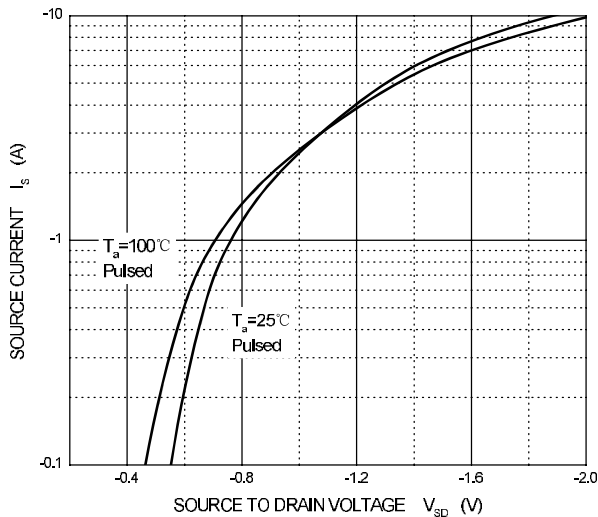
$R_{DS(on)}$  —  $I_D$



$R_{DS(on)}$  —  $V_{GS}$



$I_S$  —  $V_{SD}$



Threshold Voltage

