

### Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	$I_D$
60V	3Ω@10V	0.22A
	4Ω@4.5V	

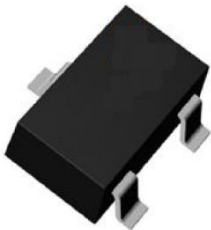
### Feature

- High density cell design for extremely low RDS(on)
- Rugged and Reliable

### Application

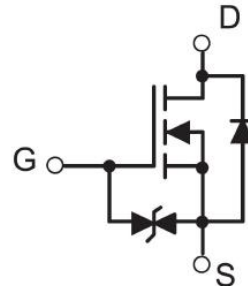
- Direct Logic-Level Interface: TTL/CMOS
- Drivers: Relays, Solenoids, Lamps, Hammers, Display, Memories, Transistors, etc
- Battery Operated Systems
- Solid-State Relays

### Package

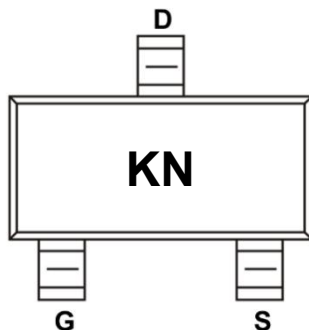


SOT-23

### Circuit diagram



### Marking



### Absolute maximum ratings (Ta=25°C unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	$V_{DS}$	60	V
Gate-Source Voltage	$V_{GS}$	±20	V
Continuous Drain Current	$I_D$	0.22	A
Power Dissipation	$P_D$	0.35	W
Thermal Resistance from Junction to Ambient	$R_{\theta JA}$	357	°C/W
Junction Temperature	$T_J$	150	°C
Storage Temperature	$T_{STG}$	-55 ~ +150	°C

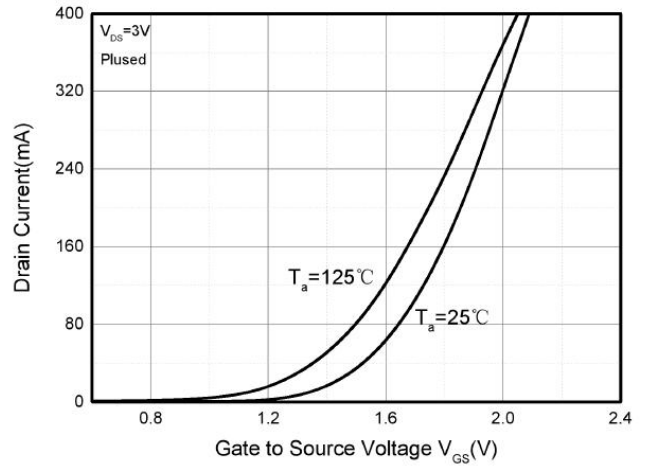
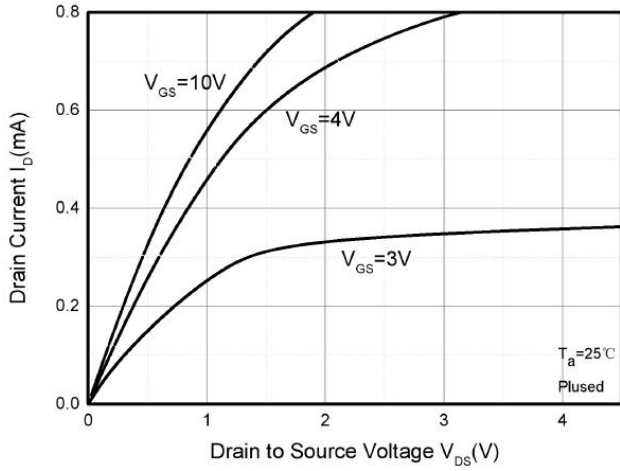
### Electrical characteristics (Ta=25 °C, unless otherwise noted)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
<b>Static Characteristics</b>						
Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 250\mu A$	60			V
Zero gate voltage drain current	$I_{DSS}$	$V_{DS} = 48V, V_{GS} = 0V$			1	μA
Gate-body leakage current	$I_{GSS}$	$V_{GS} = \pm 20V, V_{DS} = 0V$			±5	μA
Gate threshold voltage <sup>1)</sup>	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	0.8	1	1.45	V
Drain-source on-resistance <sup>1)</sup>	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 500mA$		1.5	3	Ω
		$V_{GS} = 4.5V, I_D = 200mA$		1.8	4	
<b>Dynamic characteristics<sup>2)</sup></b>						
Input Capacitance	$C_{iss}$	$V_{DS} = 25V, V_{GS} = 0V, f = 1MHz$		27		pF
Output Capacitance	$C_{oss}$			13		
Reverse Transfer Capacitance	$C_{rss}$			6		
Turn-on delay time <sup>1)</sup>	$t_{d(on)}$	$V_{DD} = 30V, V_{GS} = 10V$ $I_D = 0.22 A, R_G = 6\Omega$			5	nS
Turn-on rise time <sup>1)</sup>	$t_r$				18	
Turn-off delay time <sup>1)</sup>	$t_{d(off)}$				36	
Turn-off fall time <sup>1)</sup>	$t_f$				14	
<b>Source-Drain Diode characteristics</b>						
Diode Forward voltage	$V_{SD}$	$V_{GS} = 0V, I_S = 500mA$			1.4	V

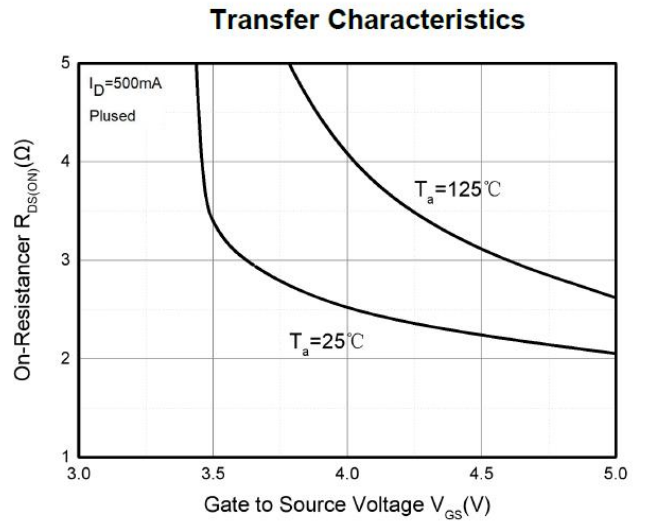
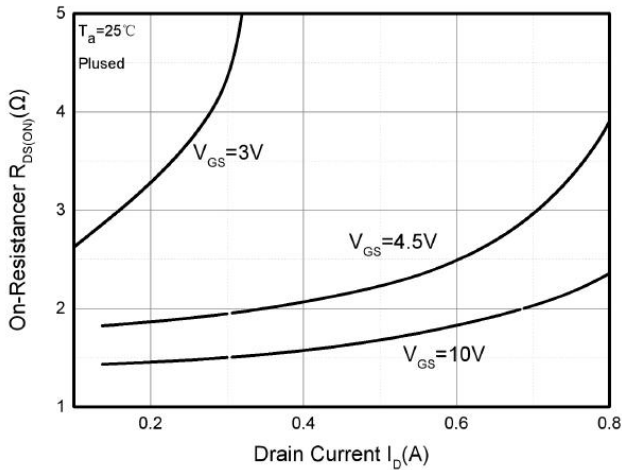
Notes:

- 1) Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
- 2) Guaranteed by design, not subject to production testing.

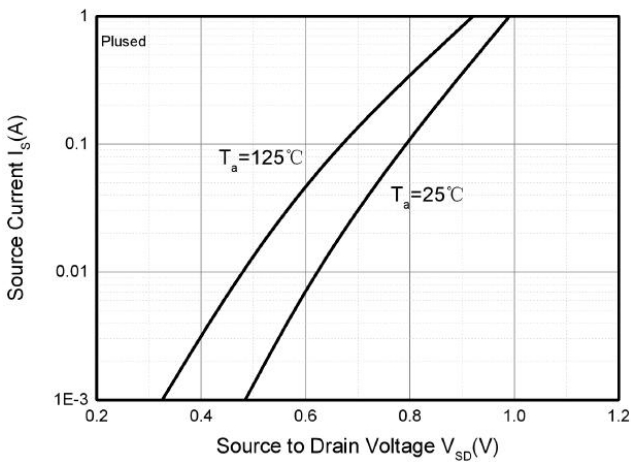
## Typical Characteristics



## Output Characteristics



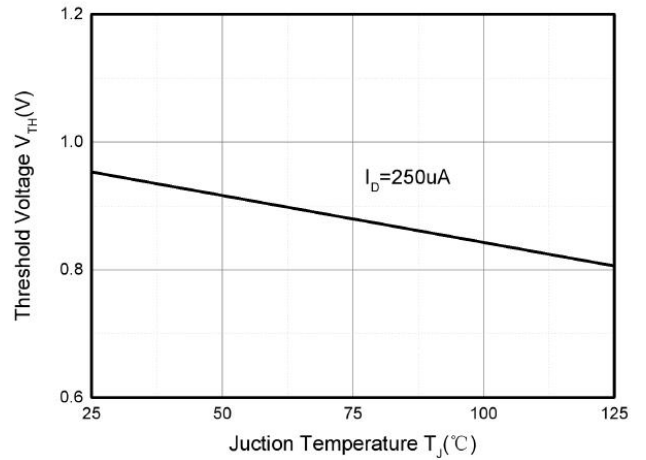
## RDS(ON)—ID



## IS—VSD

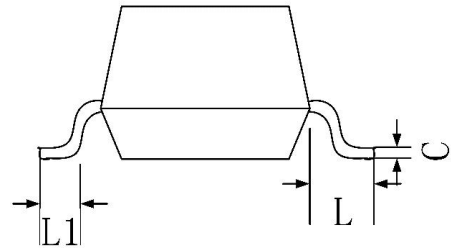
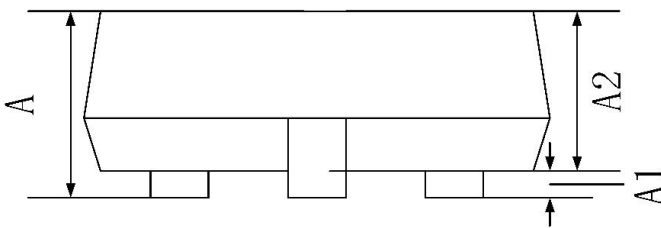
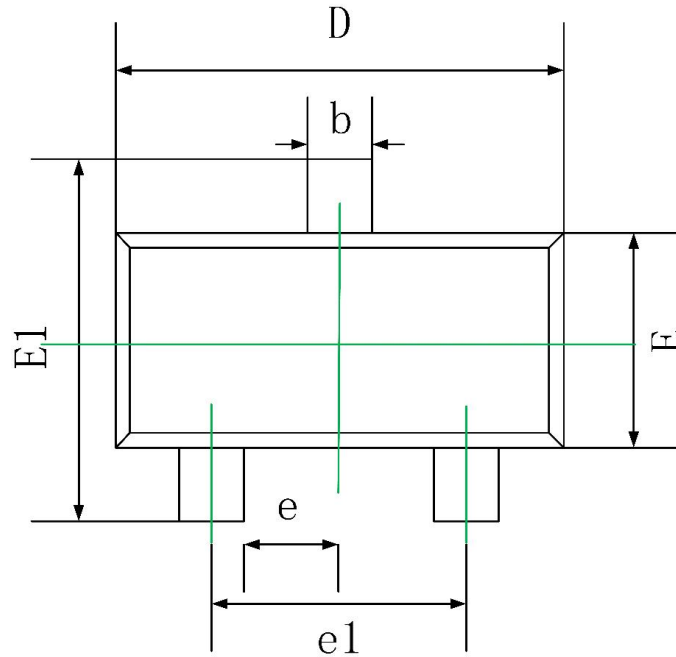
## Transfer Characteristics

## RDS(ON)—VGS



## Threshold Voltage

## SOT-23 Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.200	0.003	0.008
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 REF.		0.037 REF.	
e1	1.800	2.000	0.071	0.079
L	0.550 REF.		0.022 REF.	
L1	0.300	0.500	0.012	0.020