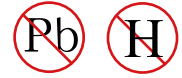




YEA SHIN TECHNOLOGY CO., LTD

2N7002SW

# N-Channel Enhancement MOSFET



VDS= 60V, ID= 320mA

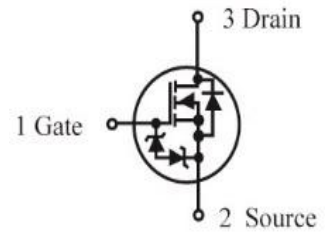
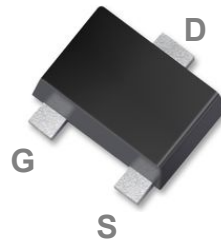
## Features

- ESD portected
- Low RDS(on)
- Marking : 701

## Application

- Low side load switch
- Level shift circuits
- DC-DC converter
- Portable applications i.e. DSC, PDA, Cell Phone, etc.

## SOT-323 Pin Configuration



## Ordering Information

Device	Qty per Reel	Reel Size
2N7002SW	3000	7Inch

## Absolute Maximum Rating $T_a=25^{\circ}\text{C}$ unless otherwise noted

Symbol	Parameter	Rating	Units
V <sub>DS</sub>	Drain-Source Voltage	60	V
V <sub>GS</sub>	Gate-Source Voltage	±20	V
I <sub>D</sub>	Drain Current – Steady State ( $T_a=25^{\circ}\text{C}$ )	320	mA
	Drain Current – Steady State ( $T_a=85^{\circ}\text{C}$ )	230	
	Drain Current – $t<5\text{s}$ ( $T_a=25^{\circ}\text{C}$ )	380	
	Drain Current – $t<5\text{s}$ ( $T_a=85^{\circ}\text{C}$ )	270	
I <sub>DM</sub>	Pulsed Drain Current ( $t_p=10\mu\text{s}$ )	1.5	A
I <sub>S</sub>	Source Current (Body Diode)	300	mA
P <sub>D</sub> (Note1)	Total Device Dissipation – Steady State	300	mW
	Total Device Dissipation – $t<5\text{s}$	420	
R <sub>θJA</sub> (Note1)	Junction to Ambient – Steady State	417	W/°C
	Junction to Ambient – $t<5\text{s}$	300	
T <sub>L</sub>	Lead Temperature for Soldering Purposes (1/8" from case for 10s)	260	°C
T <sub>J</sub>	Operating Junction Temperature Range	-55 to 150	°C
T <sub>STG</sub>	Storage Temperature Range	-55 to 150	°C
ESD	Gate-Source ESD Rating (HBM, Method 3015)	±2000	V

# DEVICE CHARACTERISTICS

## 2N7002SW

### Electrical Characteristics (T<sub>a</sub>=25°C, unless otherwise)

#### Off Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV <sub>DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>D</sub> =250μA	60	---	---	V
I <sub>DSS</sub>	Drain-Source Leakage Current	V <sub>DS</sub> =60V, V <sub>GS</sub> =0V, T <sub>J</sub> =25°C	---	---	1	μA
		V <sub>DS</sub> =60V, V <sub>GS</sub> =0V, T <sub>J</sub> =125°C	---	---	500	
		V <sub>DS</sub> =50V, V <sub>GS</sub> =0V, T <sub>J</sub> =25°C	---	---	100	nA
I <sub>GSS</sub>	Gate-Source Leakage Current	V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V	---	---	±10	μA

#### On Characteristics (Note 2)

R <sub>DS(ON)</sub>	Static Drain-source On-Resistance	V <sub>GS</sub> =10V, I <sub>D</sub> =500mA	---	---	2.8	Ω
		V <sub>GS</sub> =4.5V, I <sub>D</sub> =200mA	---	---	3.2	Ω
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>GS</sub> =V <sub>DS</sub> , I <sub>D</sub> =250μA	1	---	2	V
g <sub>fs</sub>	Forward Transconductance	V <sub>DS</sub> =5V, I <sub>D</sub> =200mA	80	---	---	mS

#### Dynamic and Switching Characteristics

Q <sub>g</sub>	Total Gate Charge	V <sub>DS</sub> =10V, V <sub>GS</sub> =4.5V, I <sub>D</sub> =500mA	---	0.44	---	nC
Q <sub>gs</sub>	Gate-Source Charge		---	0.2	---	
Q <sub>gd</sub>	Gate-Drain Charge		---	0.1	---	
T <sub>d(on)</sub>	Turn-On Delay Time	V <sub>DD</sub> =30V, V <sub>GS</sub> =10V, R <sub>G</sub> =25 Ω, I <sub>D</sub> =500mA, R <sub>L</sub> =60 Ω	---	2.7	---	ns
T <sub>r</sub>	Rise Time		---	2.5	---	
T <sub>d(off)</sub>	Turn-Off Delay Time		---	13	---	
T <sub>f</sub>	Fall Time		---	8	---	
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> =25V, V <sub>GS</sub> =0V, f=1MHz	---	---	35	pF
C <sub>oss</sub>	Output Capacitance		---	---	10	
C <sub>rss</sub>	Reverse Transfer Capacitance		---	---	5	

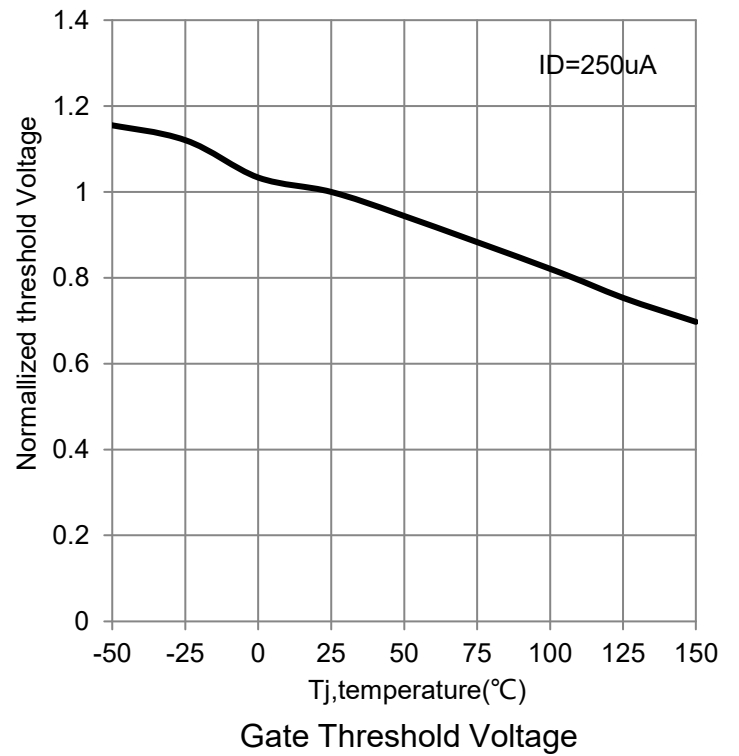
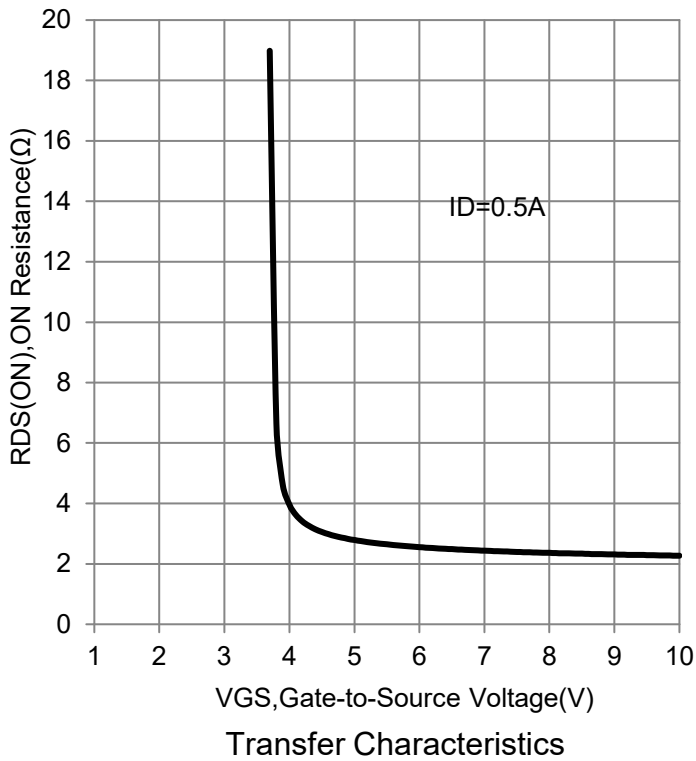
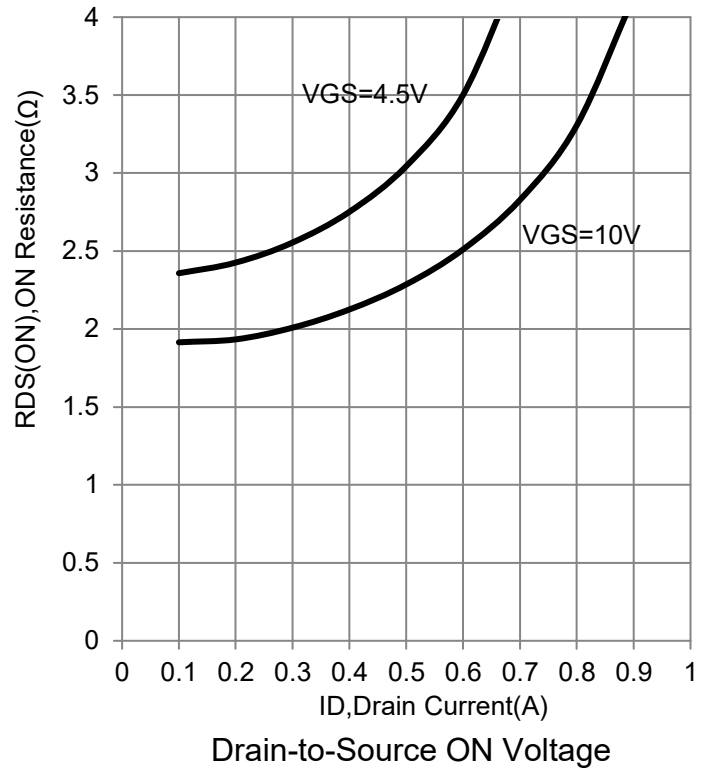
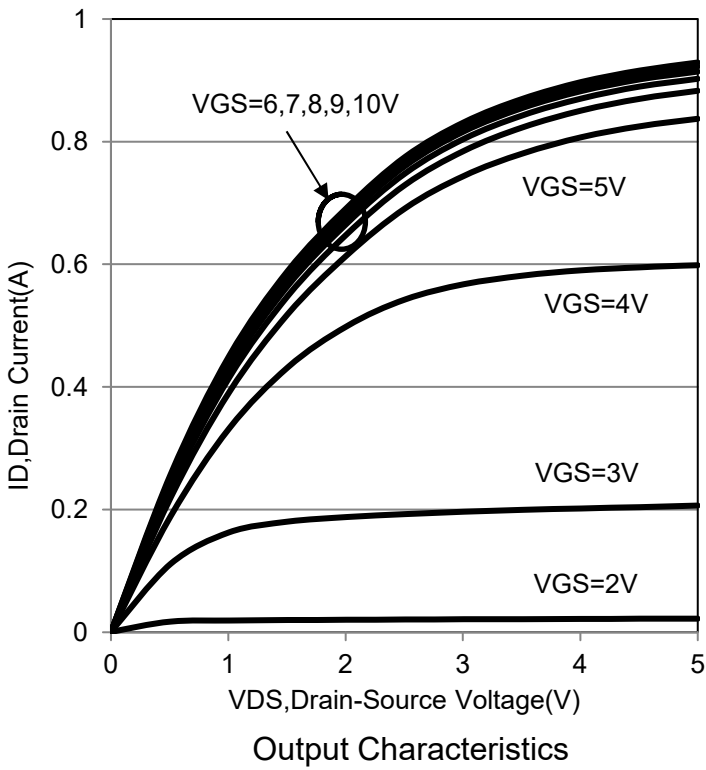
#### Drain-Source Diode Characteristics and Maximum Ratings

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
V <sub>SD</sub>	Diode Forward Voltage	V <sub>GS</sub> =0V, I <sub>S</sub> =0.5A	---	0.85	---	V

- FR-4 = 1\*0.75\*0.062 inch.
- Pulse Test : Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.

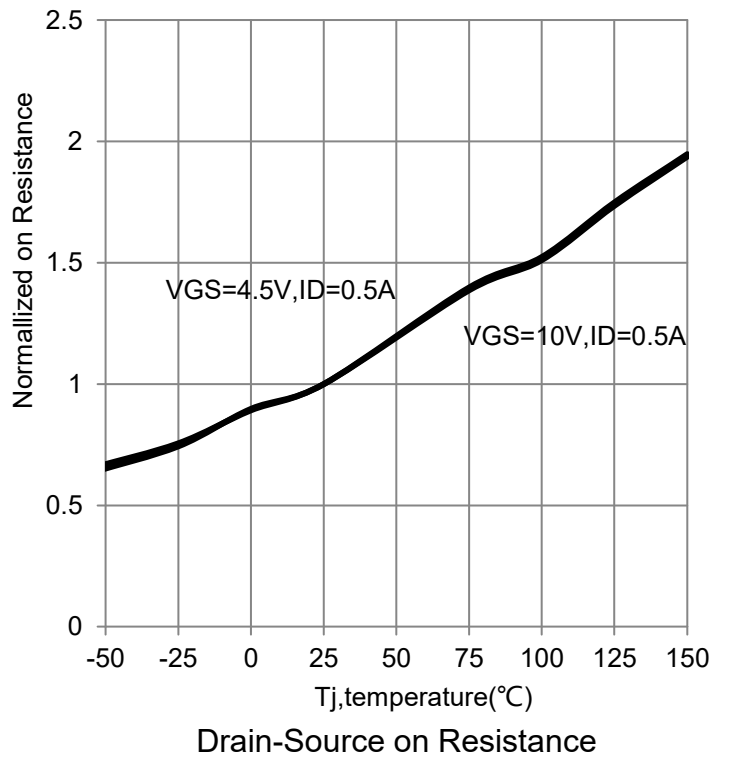
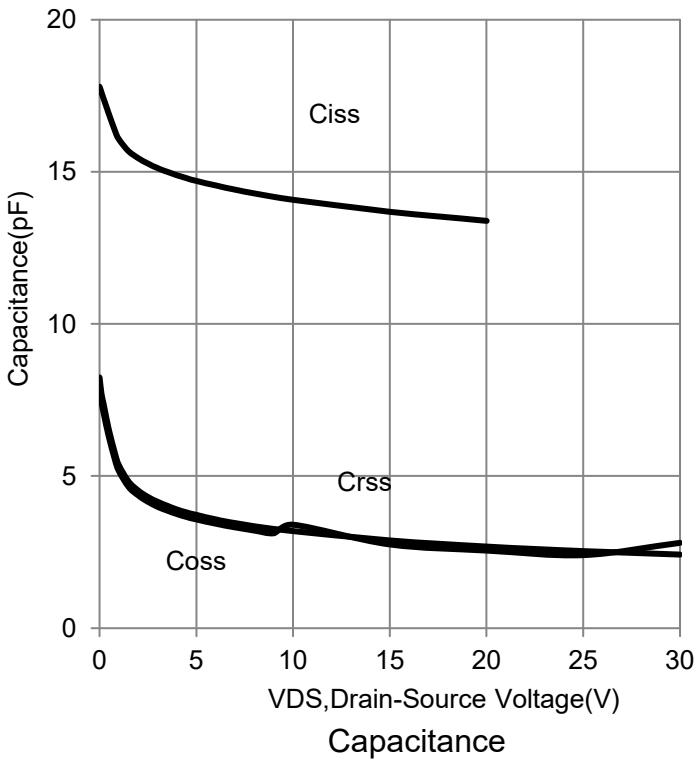
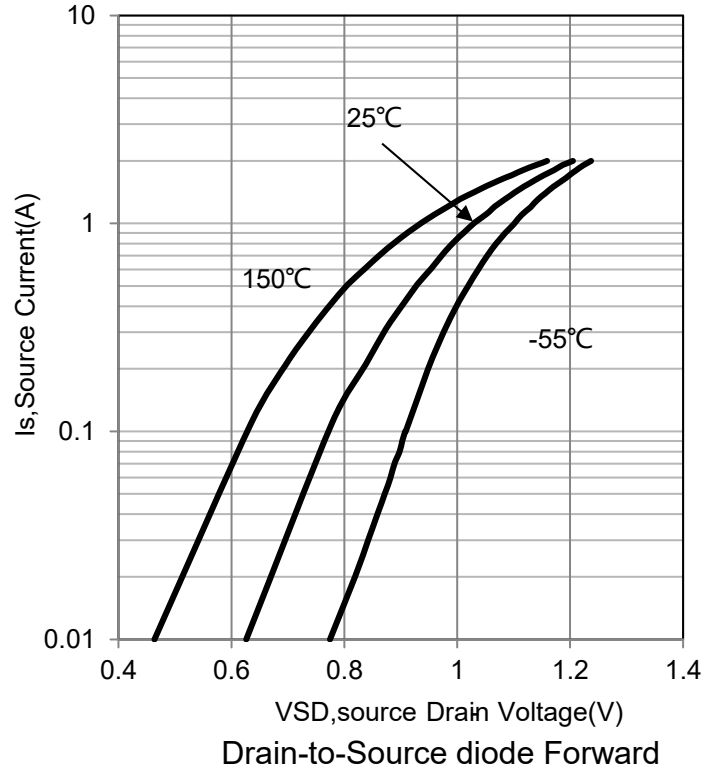
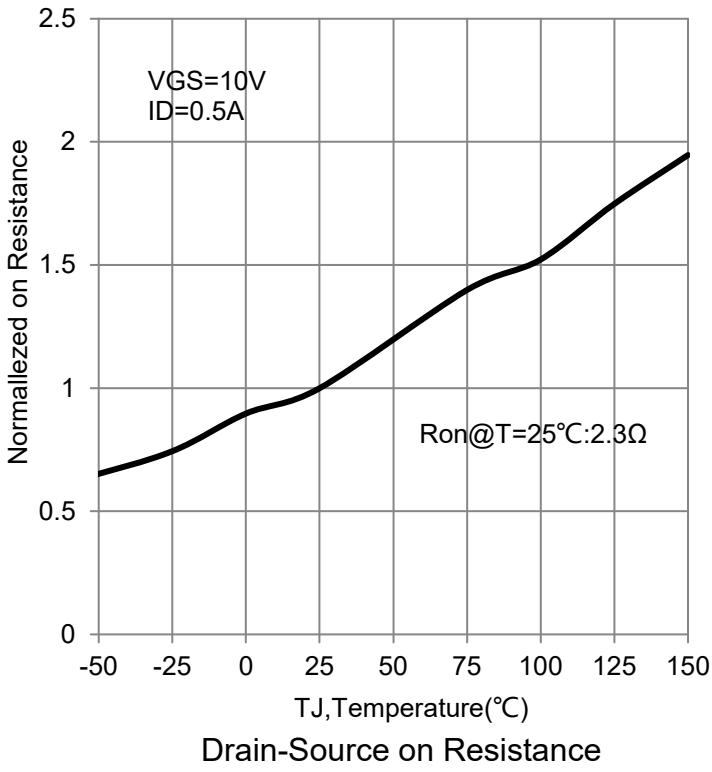
# DEVICE CHARACTERISTICS

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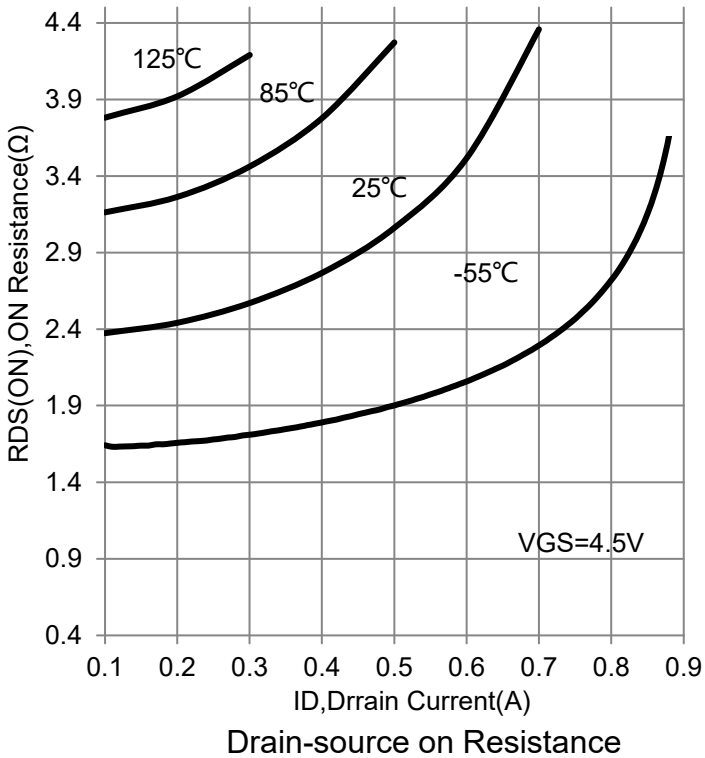
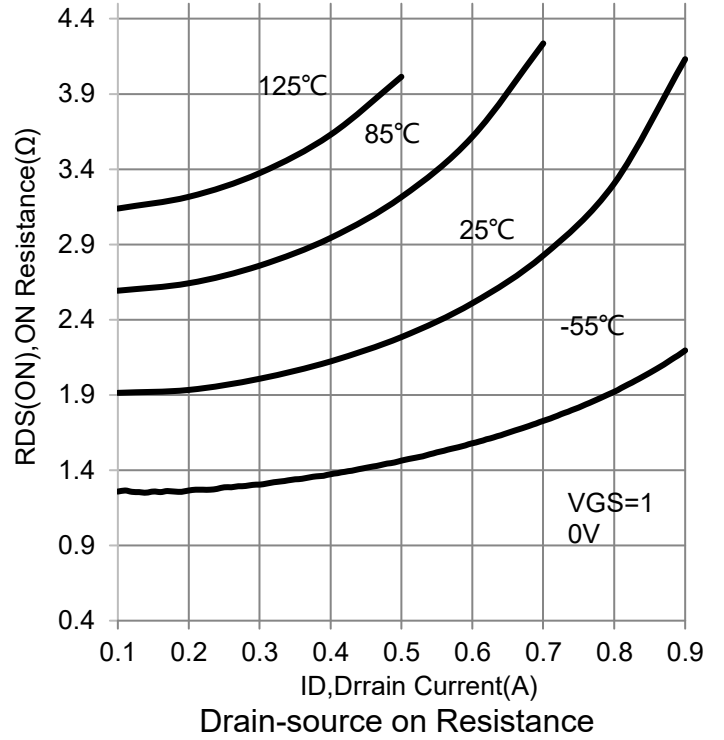
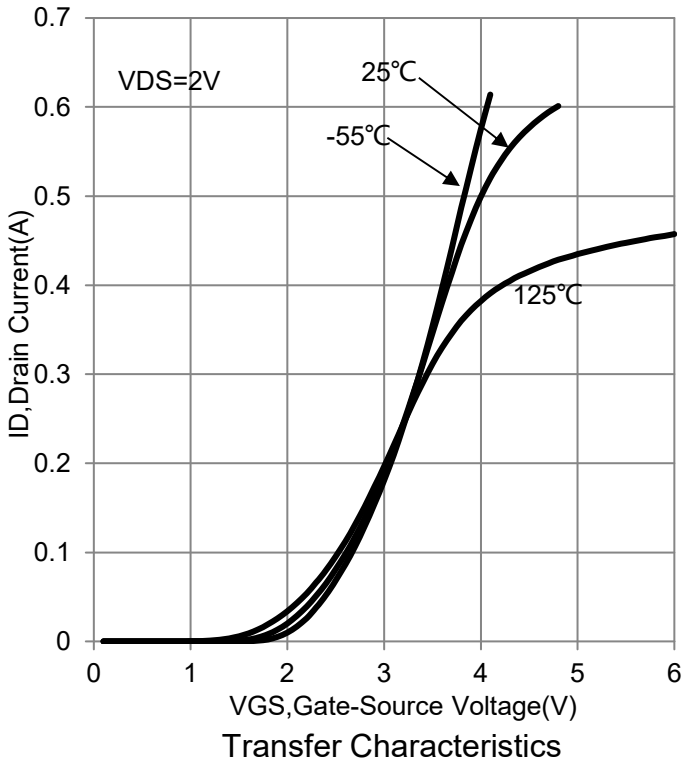
# DEVICE CHARACTERISTICS

## 2N7002SW



# DEVICE CHARACTERISTICS

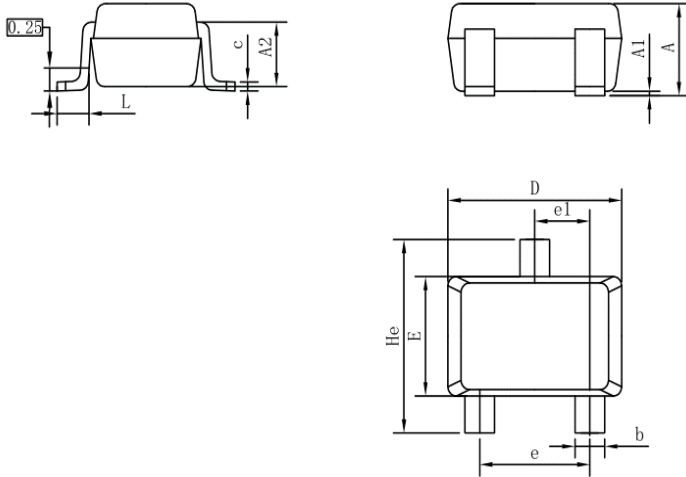
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# PACKAGE OUTLINE & DIMENSIONS

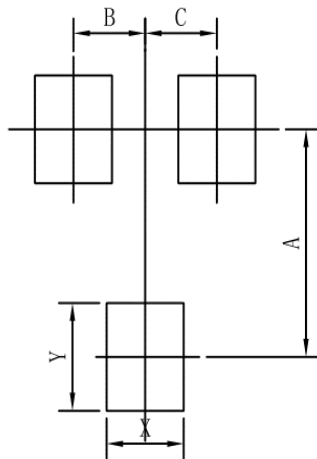
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## Outline and dimensions



SOT-323			
DIM	MIN	NOR	MAX
A	0.80	0.95	1.00
A1	0.00	0.05	0.10
A2	0.7 REF		
b	0.30	0.35	0.40
c	0.10	0.15	0.25
D	1.80	2.05	2.20
E	1.15	1.30	1.35
e	1.20	1.30	1.40
e1	0.65 BSC		
L	0.20	0.35	0.56
He	2.00	2.10	2.40
ALL Dimension in mm			

## Soldering footprint



SOT-323	
DIM	MIN
A	1.90
B	0.65
C	0.65
X	0.70
Y	0.90