



## Description

The 2N7002KDW\_R1\_00001 uses advanced trench technology to provide excellent  $R_{DS(ON)}$ , low gate charge and operation with gate voltages as low as 4.5V. This device is suitable for use as a Battery protection or in other Switching application.

## General Features

$V_{DS} = 60V$   $I_D = 0.115A$

$R_{DS(ON)} < 3\Omega @ V_{GS}=10V$

## Application

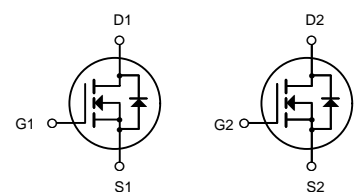
Wireless charging

Boost driver

Brushless motor



SOT-363  
(SC-70-6)



Dual N-Channel MOSFET

## Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
2N7002KDW_R1_00001	SOT-363(SC-70-6)	72K	3000

## Absolute Maximum Ratings ( $T_C=25^{\circ}C$ unless otherwise noted)

Symbol	Parameter	Limit	Unit
$V_{DS}$	Drain-Source Voltage	60	V
$V_{GS}$	Gate-Source Voltage	$\pm 20$	V
$I_D$	CDrain Current-Continuous	0.115	A
$P_D$	Maximum Power Dissipation	0.15	W
$T_J, T_{STG}$	Operating Junction and Storage Temperature Range	-55 To 150	$^{\circ}C$
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient (Note 2)	833	$^{\circ}C/W$



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

Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS}=0\text{ V}$ , $I_D=250\text{ }\mu\text{A}$	60			V
Gate-threshold voltage *	$V_{th(GS)}$	$V_{DS}=V_{GS}$ , $I_D=250\text{ }\mu\text{A}$	1	1.6	2.5	
Gate-body leakage	$I_{GSS}$	$V_{DS}=0\text{ V}$ , $V_{GS}=\pm 20\text{ V}$			$\pm 80$	nA
Zero gate voltage drain current	$I_{DSS}$	$V_{DS}=60\text{ V}$ , $V_{GS}=0\text{ V}$			80	nA
Drain-source on-resistance *	$R_{DS(on)}$	$V_{GS}=10\text{ V}$ , $I_D=115\text{ mA}$		1.3	3	$\Omega$
		$V_{GS}=4.5\text{ V}$ , $I_D=50\text{ mA}$		2	5	
Forward transconductance *	$g_{fs}$	$V_{DS}=10\text{ V}$ , $I_D=200\text{ mA}$	80			ms
Drain-source on-voltage *	$V_{DS(on)}$	$V_{GS}=10\text{ V}$ , $I_D=500\text{ mA}$			3.75	V
		$V_{GS}=5\text{ V}$ , $I_D=50\text{ mA}$			0.375	V
Diode forward voltage	$V_{SD}$	$I_S=115\text{ mA}$ , $V_{GS}=0\text{ V}$	0.55		1.2	V
Input capacitance **	$C_{iss}$	$V_{DS}=25\text{ V}$ , $V_{GS}=0\text{ V}$ , $f=1\text{ MHz}$			50	pF
Output capacitance **	$C_{oss}$				25	
Reverse transfer capacitance **	$C_{rss}$				5	

**Switching Time**

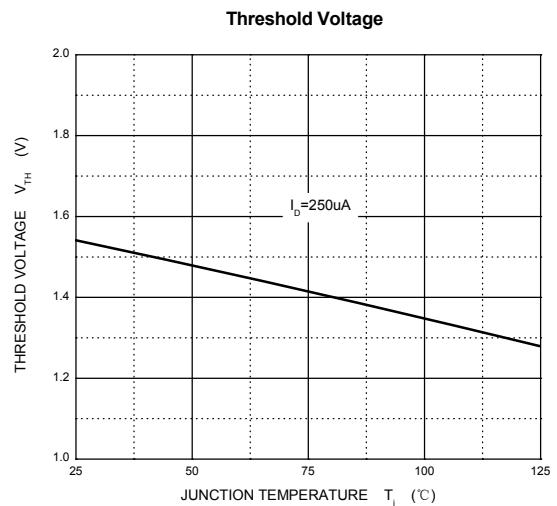
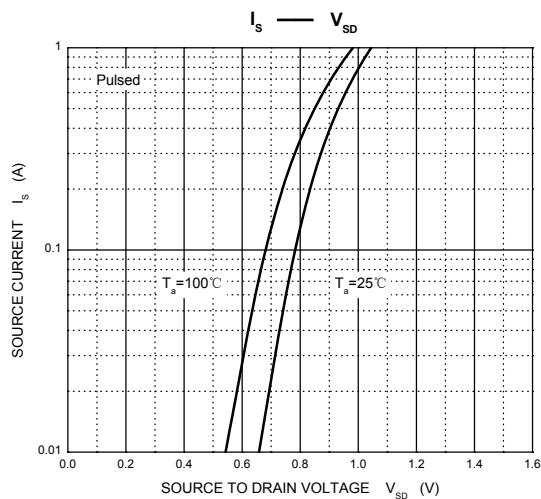
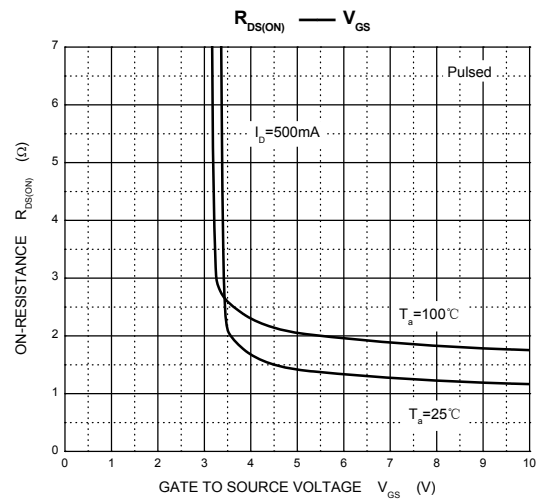
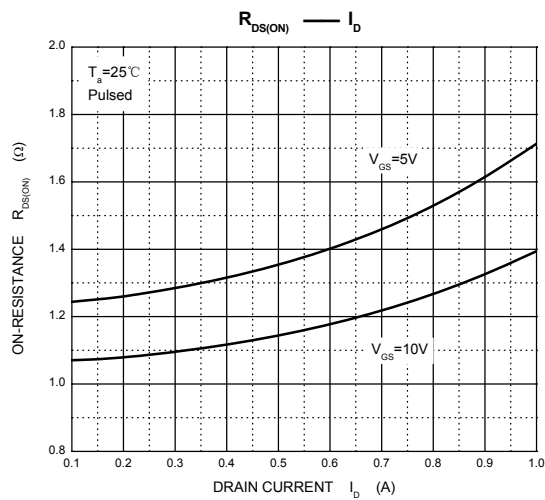
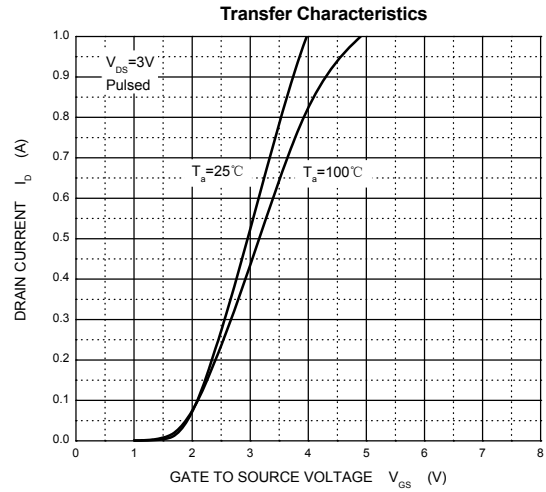
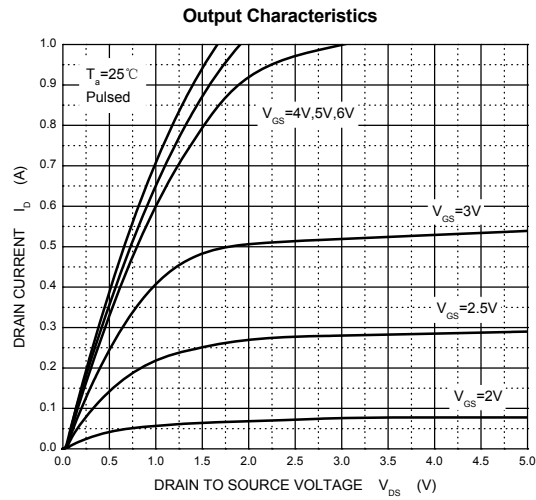
Turn-on time **	$t_{d(on)}$	$V_{DD}=25\text{ V}$ , $R_L=50\Omega$			20	ns
Turn-off time **	$t_{d(off)}$	$I_D=500\text{ mA}$ , $V_{GEN}=10\text{ V}$ , $G=25\text{ }\Omega$			40	

\* Pulse Test: Pulse width  $\leq 300\mu\text{s}$ , duty cycle  $\leq 2\%$ .

\*\* These parameters have no way to verify.

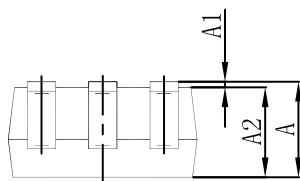
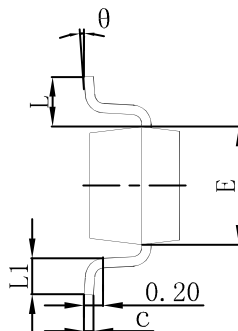
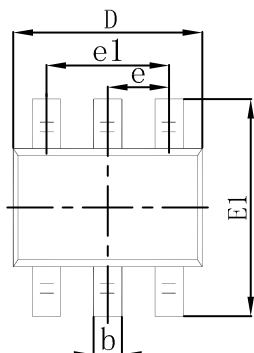


## Typical Characteristics



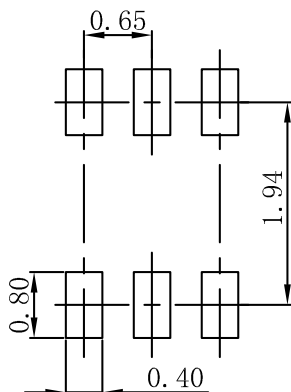


## SOT-363(SC-70-6) Package Outline Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.100	0.035	0.043
A1	0.000	0.100	0.000	0.004
A2	0.900	1.000	0.035	0.039
b	0.150	0.350	0.006	0.014
c	0.100	0.150	0.004	0.006
D	2.000	2.200	0.079	0.087
E	1.150	1.350	0.045	0.053
E1	2.150	2.400	0.085	0.094
e	0.650 TYP		0.026 TYP	
e1	1.200	1.400	0.047	0.055
L	0.525 REF		0.021 REF	
L1	0.260	0.460	0.010	0.018
θ	0°	8°	0°	8°

## SOT-363(SC-70-6) Suggested Pad Layout



### Note:

1. Controlling dimension: in millimeters.
2. General tolerance:  $\pm 0.05\text{mm}$ .
3. The pad layout is for reference purposes only.



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