



Description

The 2N7002KDW 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

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

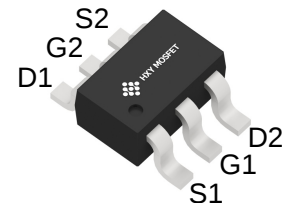
$R_{DS(ON)} < 3\Omega @ V_{GS} = 10V$

Application

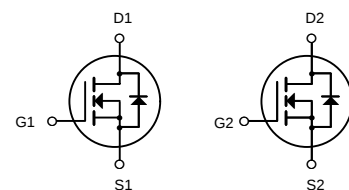
Wireless charging

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	SOT-363(SC-70-6)	72K	3000

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

Symbol	Parameter	Limit	Unit
V_{DS}	Drain-Source Voltage	60	V
V_{GS}	Gate-Source Voltage	± 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	$^\circ\text{C}$
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient (Note 2)	833	$^\circ\text{C/W}$



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}	$V_{DS}=0\text{ V}$, $V_{GS}=\pm 20\text{ V}$			± 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	Ω
		$V_{GS}=4.5\text{ V}$, $I_D=50\text{ mA}$		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

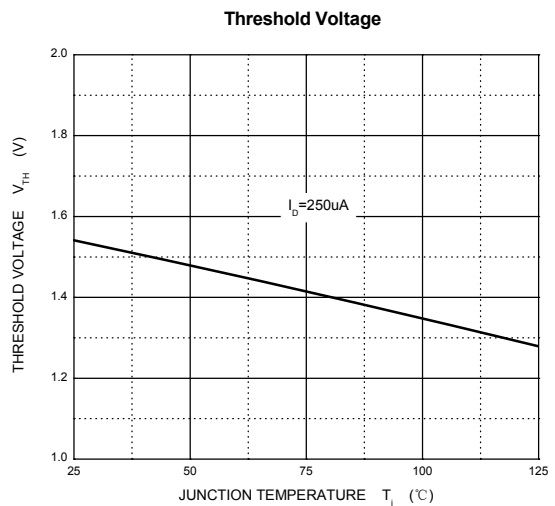
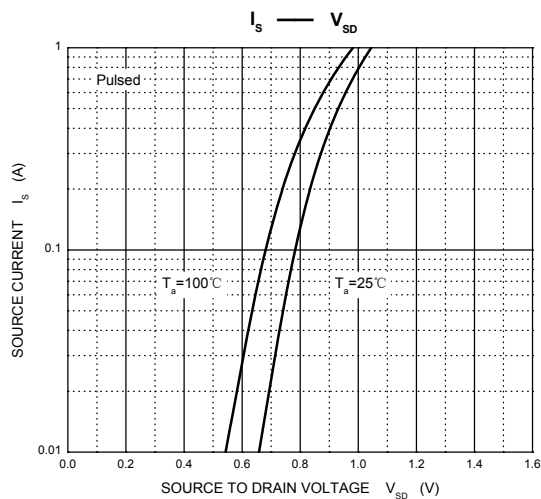
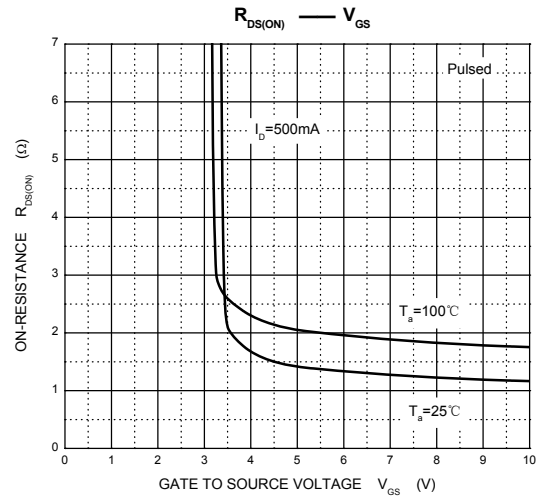
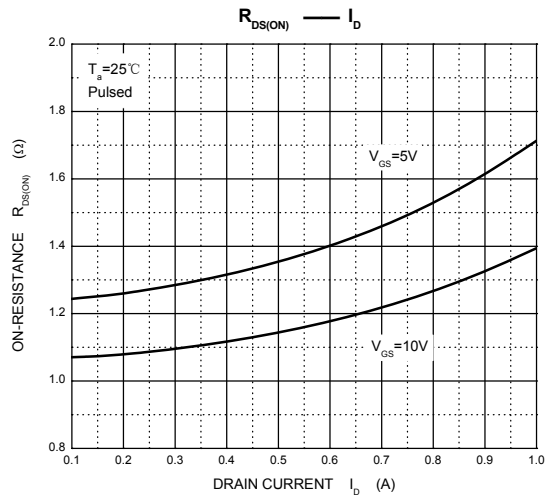
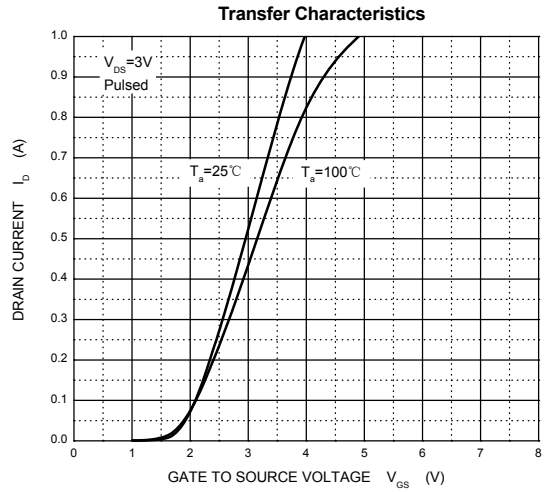
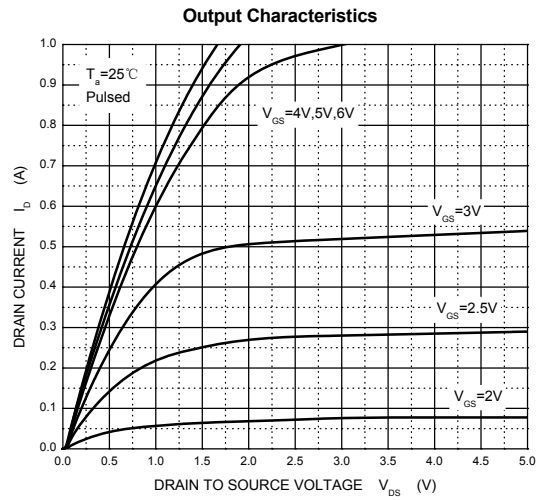
Turn-on time **	$t_{d(on)}$	$V_{DD}=25\text{ V}$, $R_L=50\Omega$			20	ns
Turn-off time **	$t_{d(off)}$	$I_D=500\text{ mA}$, $V_{GEN}=10\text{ V}$, $V_G=25\text{ V}$			40	

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

** These parameters have no way to verify.

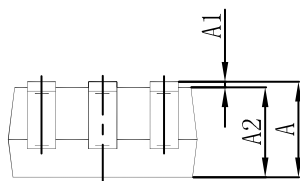


Typical Characteristics



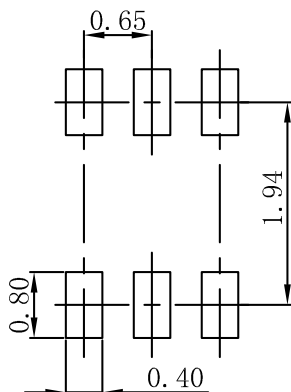


SOT-363(SC-70-6) Package Outline Dimensions



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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