

## Features

- Trench Power LV MOSFET technology
- AEC-Q101 Qualified
- ESD Protected up to 2KV (HBM)
- Moisture Sensitivity Level 1
- Halogen Free. "Green" Device <sup>(Note1)</sup>
- Lead Free Finish/RoHS Compliant ("P" Suffix Designates RoHS Compliant. See Ordering Information)

## Maximum Ratings

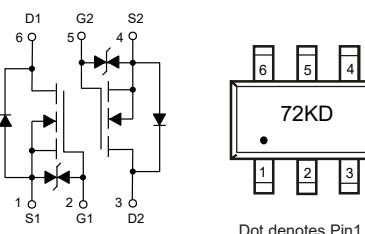
- Operating Junction Temperature Range : -55°C to +150°C
- Storage Temperature Range: -55°C to +150°C
- Thermal Resistance: 515°C/W Junction to Ambient(Steady-State) <sup>(Note2)</sup>

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	$V_{DS}$	60	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Continuous Drain Current	$I_D$	220	mA
		140	
Pulsed Drain Current <sup>(Note3)</sup>	$I_{DM}$	0.88	A
Total Power Dissipation <sup>(Note4)</sup>	$P_D$	0.24	W

Note:

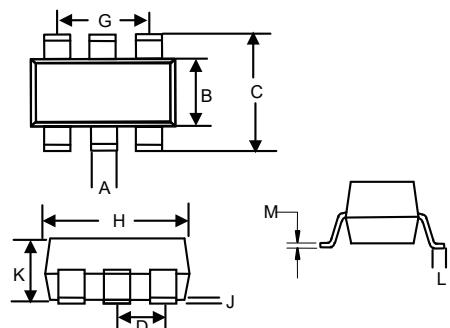
1. Halogen free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
2. The value of  $R_{\theta JA}$  is measured with the device mounted on 1in<sup>2</sup> FR-4 board with 2oz. Copper, in a still air environment with  $T_A = 25^\circ C$ . The Power dissipation  $P_{DSM}$  is based on  $R_{\theta JA} \leq 10$  s and the maximum allowed junction temperature of 150°C. The value in any given application depends on the user's specific board design.
3. Repetitive rating: pulse width limited by max. junction temperature.
4.  $P_D$  is based on max. junction temperature, using junction to Ambient thermal resistance.

## Internal Structure and Marking Code



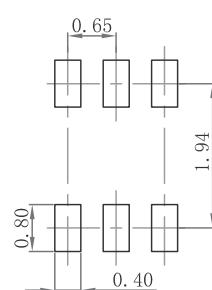
## DUAL N-CHANNEL MOSFET

### SOT-363



DIM	INCHES		MM		NOTE
	MIN	MAX	MIN	MAX	
A	0.006	0.014	0.15	0.35	
B	0.045	0.053	1.15	1.35	
C	0.079	0.096	2.00	2.45	
D	0.026		0.65		TYP.
G	0.047	0.055	1.20	1.40	
H	0.071	0.087	1.80	2.20	
J	-----	0.004	-----	0.10	
K	0.031	0.043	0.80	1.10	
L	0.010	0.018	0.26	0.46	
M	0.003	0.006	0.08	0.15	

### SUGGESTED SOLDER PAD LAYOUT



**Electrical Characteristics @ 25°C (Unless Otherwise Specified)**

Parameter	Symbol	Test Conditions	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
Gate-Source Leakage Current	$I_{GSS}$	$V_{DS}=0V, V_{GS}=\pm 20V$			$\pm 10$	$\mu A$
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=48V, V_{GS}=0V$			1	$\mu A$
Gate-Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	0.8	1.5	2.4	V
Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=300mA$		1.1	2.5	$\Omega$
		$V_{GS}=4.5V, I_D=200mA$		1.3	3	
<b>Diode Characteristics</b>						
Diode Forward Voltage	$V_{SD}$	$V_{GS}=0V, I_S=300mA$		0.9	1.2	V
Reverse Recovery Time	$t_{rr}$	$I_F=1A, dI_F/dt=100A/\mu s$		15		ns
Reverse Recovery Charge	$Q_{rr}$			3.9		nC
<b>Dynamic Characteristics</b>						
Input Capacitance	$C_{iss}$	$V_{DS}=25V, V_{GS}=0V, f=1MHz$		25		pF
Output Capacitance	$C_{oss}$			8		
Reverse Transfer Capacitance	$C_{rss}$			4		
Total Gate Charge	$Q_g$	$V_{DS}=30V, V_{GS}=10V, I_D=1A$		1.75		nC
Gate-Source Charge	$Q_{gs}$			1		
Gate-Drain Charge	$Q_{gd}$			0.25		
Turn-On Delay Time	$t_{d(on)}$	$V_{DD}=30V, V_{GS}=10V$ $R_{GEN}=3\Omega, I_{DS}=1A$		4.6		ns
Turn-On Rise Time	$t_r$			20		
Turn-Off Delay Time	$t_{d(off)}$			10.5		
Turn-Off Fall Time	$t_f$			25.5		

## Curve Characteristics

Fig. 1 - Typical Output Characteristics

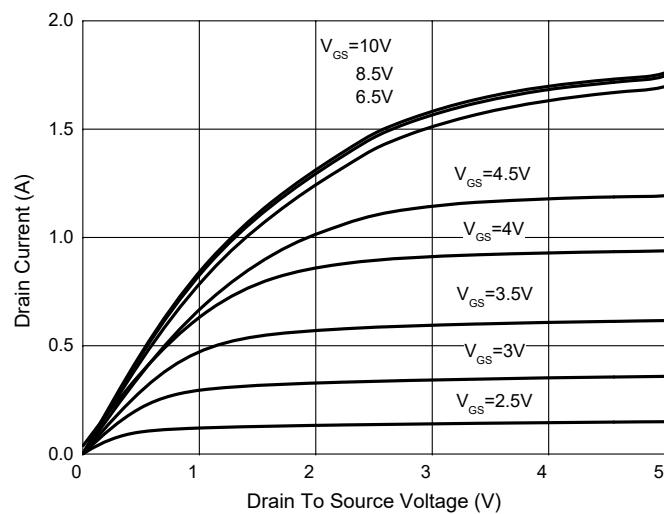


Fig. 2 - Transfer Characteristics

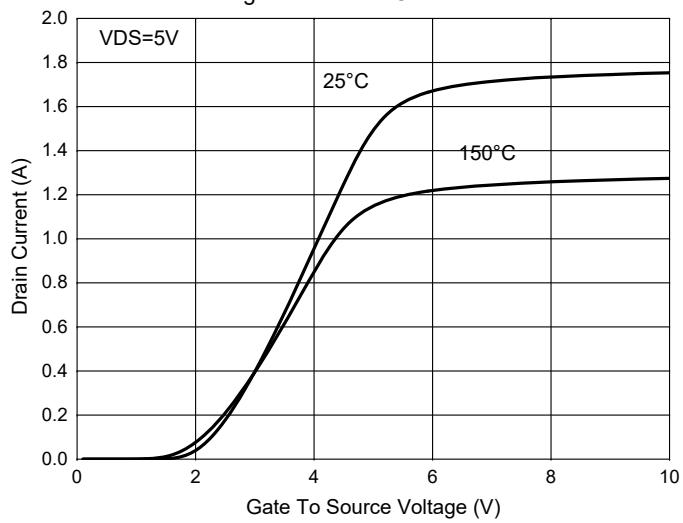


Fig. 3- Capacitance Characteristics

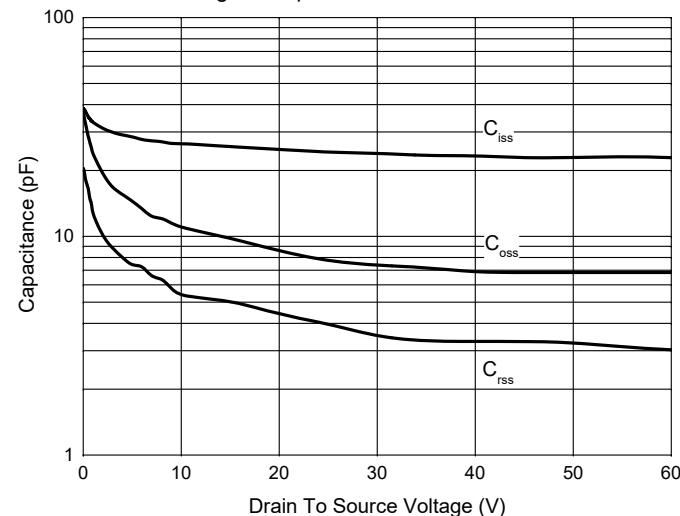


Fig. 4 - GateCharge

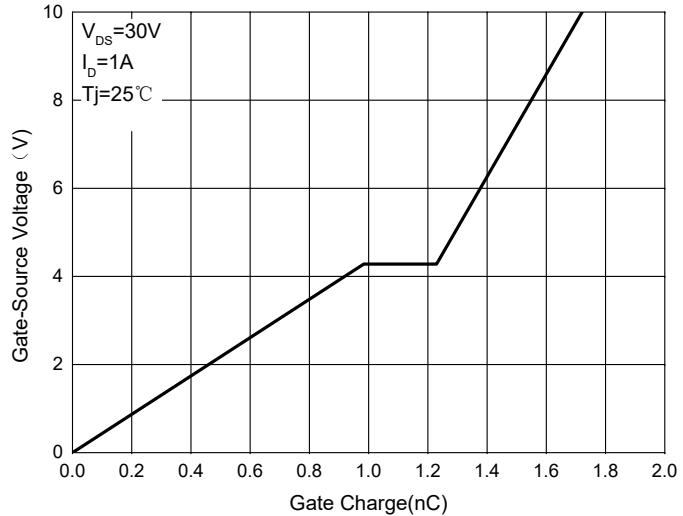


Fig. 5 -  $R_{DS(ON)}$ — $V_{GS}$

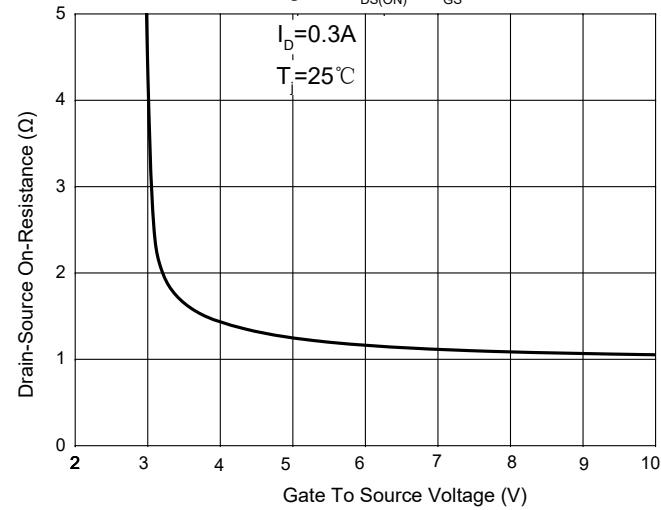
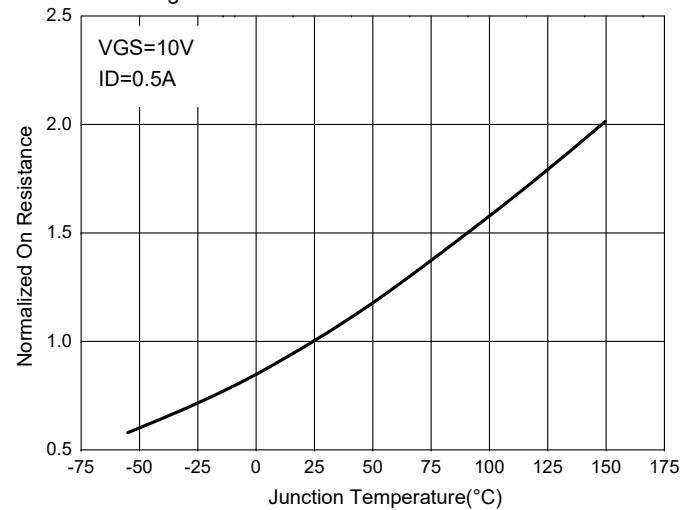
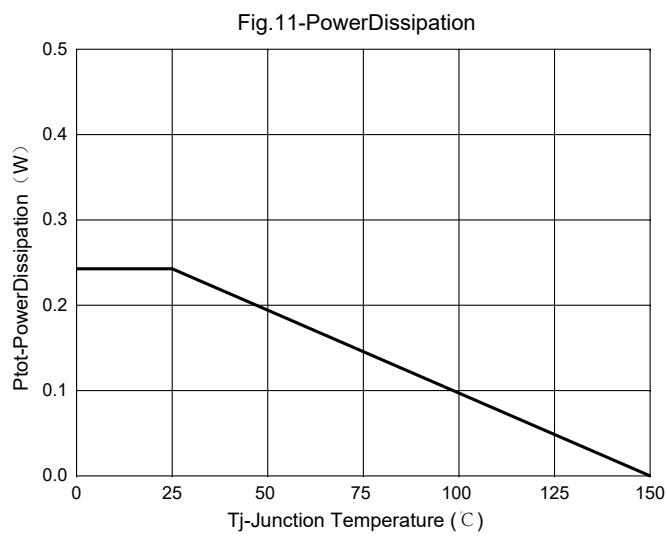
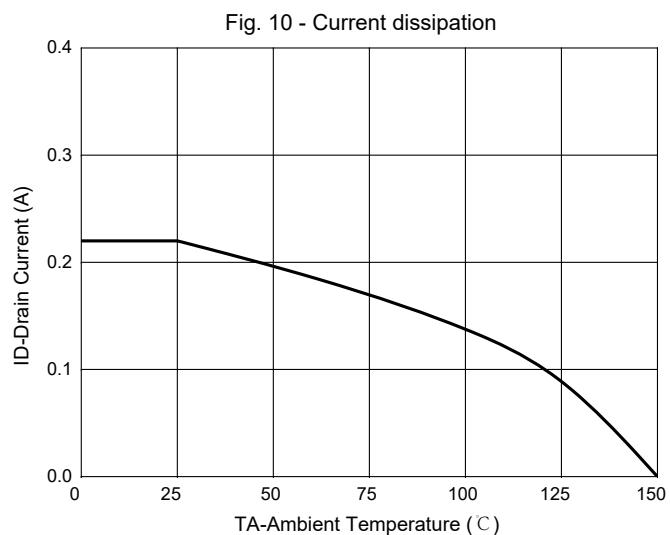
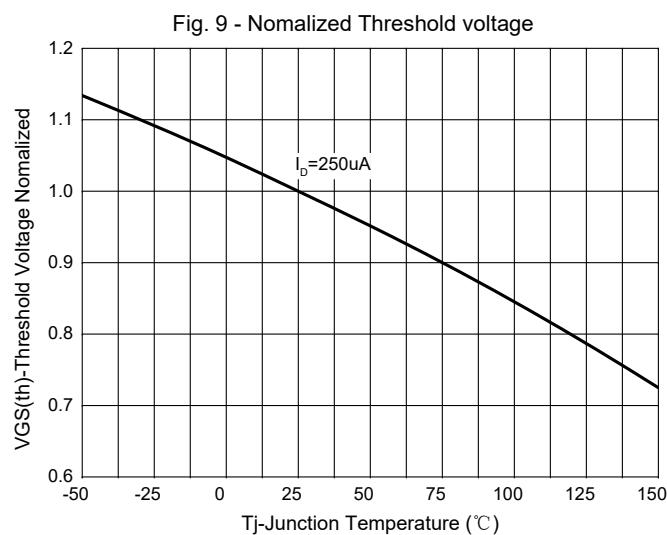
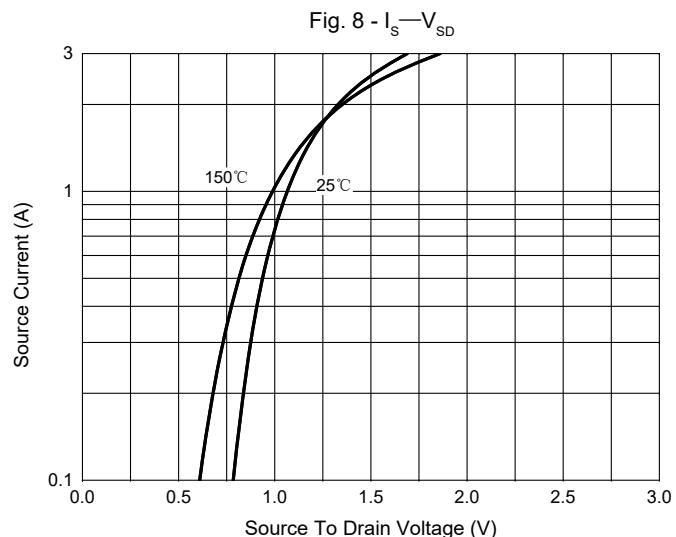
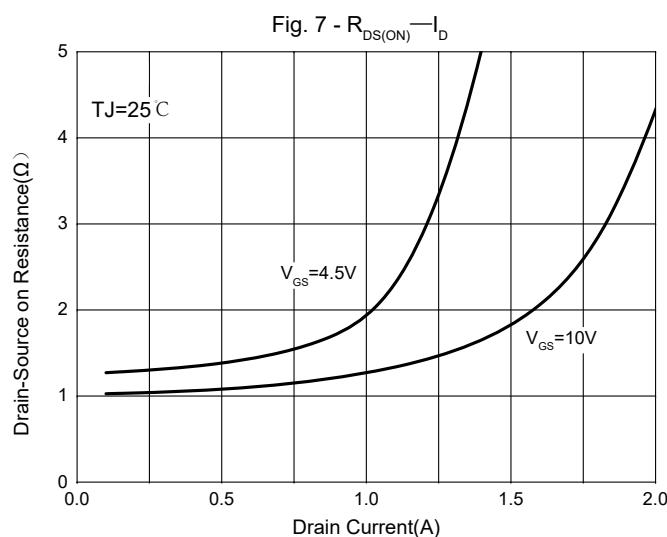


Fig.6-NormalizedOnResistanceCharacteristics



## Curve Characteristics



## Curve Characteristics

Fig. 12 - Safe Operation Area

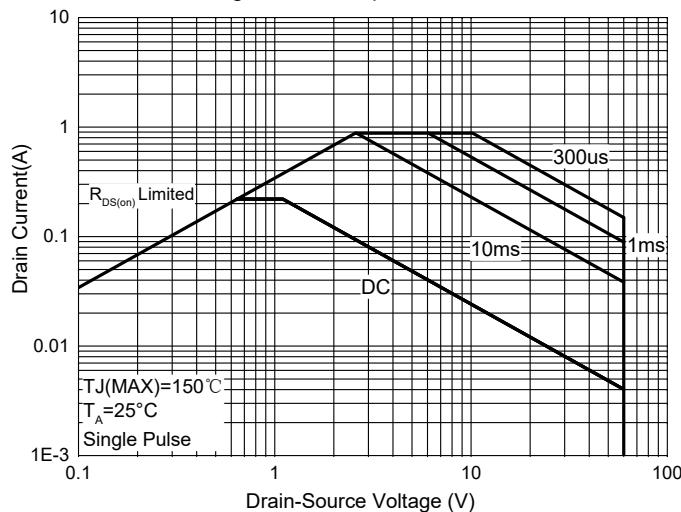
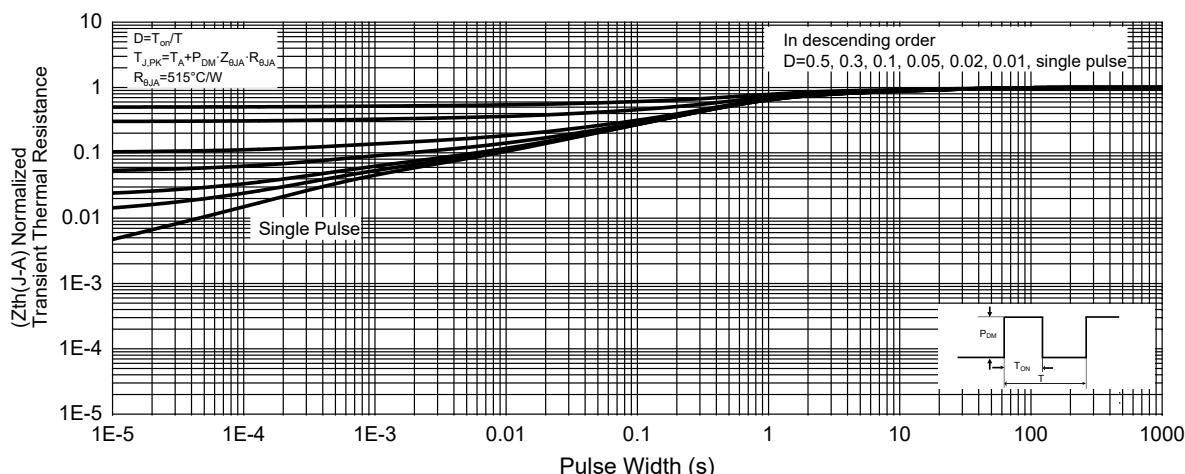


Fig. 13 -Normalized Transient Thermal Impedance



## Ordering Information

Device	Packing
2N7002KDWBQ-TP	Tape&Reel: 3Kpcs/Reel

## Revision History

Datasheet status	Version No	Release date	Update content
New product datasheet	Rev4-1	20221220	

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