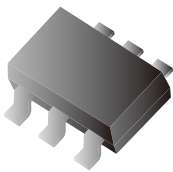


2N7002KDW-HF

N-Channel
RoHS Device
Halogen Free



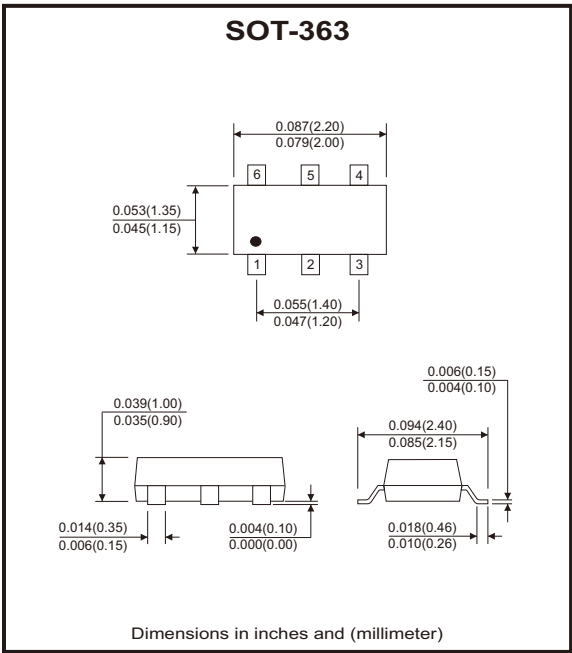
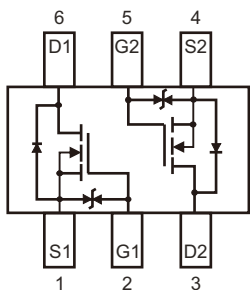
Features

- High density cell design for low $R_{DS(ON)}$.
- Voltage controlled small signal switch.
- High saturation current capability.
- ESD protected.

Mechanical data

- Case: SOT-363, molded plastic.
- Epoxy: UL 94V-0 flammability rating.

Circuit Diagram



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

Parameter	Symbol	Value	Unit
Drain-Source voltage	V_{DS}	60	V
Gate-Source voltage	V_{GS}	± 20	V
Drain current	I_D	340	mA
Total power dissipation	P_D	150	mW
Thermal resistance from junction to ambient	$R_{\theta JA}$	820	$^{\circ}\text{C/W}$
Junction temperature	T_J	150	$^{\circ}\text{C}$
Storage temperature range	T_{STG}	-55 to +150	$^{\circ}\text{C}$

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

Parameter	Conditions	Symbol	Min	Typ	Max	Unit
Static Characteristics						
Drain-Source breakdown voltage	$V_{GS} = 0V, I_D = 250\mu A$	$V_{(BR)DSS}$	60			V
Gate-Threshold voltage (Note 1)	$V_{DS} = V_{GS}, I_D = 1mA$	$V_{GS(th)}$	1		2.5	V
Gate-body leakage	$V_{DS} = 0V, V_{GS} = \pm 20V$	I_{GSS}			± 10	μA
Zero gate voltage drain current	$V_{DS} = 48V, V_{GS} = 0V$	I_{DSS}			1	μA
Drain-Source on-resistance (Note 1)	$V_{GS} = 4.5V, I_D = 200mA$	$R_{DS(ON)}$			5.3	Ω
	$V_{GS} = 10V, I_D = 500mA$				5	
Diode forward voltage (Note 1)	$V_{GS} = 0V, I_S = 300mA$	V_{SD}			1.5	V
Recovered charge	$V_{GS} = 0V, I_S = 300mA, V_R = 25V$ $dI_S/dt = -100A/\mu s$	Q_r		30		nC
Dynamic Characteristics						
Input capacitance	$V_{DS} = 10V, V_{GS} = 0V, f = 1MHz$	C_{iss}			40	pF
Output capacitance		C_{oss}			30	pF
Reverse transfer capacitance		C_{rss}			10	pF
Switching Characteristics						
Turn-on delay time	$V_{DD} = 50V, V_{GS} = 10V, R_L = 250\Omega$	$t_{d(on)}$			10	ns
Turn-off delay time	$R_{GS} = 50\Omega, R_{GEN} = 50\Omega$	$t_{d(off)}$			15	ns
Reverse recovery time	$V_{GS} = 0V, I_S = 300mA, V_R = 25V$ $dI_S/dt = -100A/\mu s$	t_{rr}		30		ns
Gate-Source Zener Diode						
Gate-Source breakdown voltage	$I_{GS} = \pm 1mA$ (open drain)	BV_{GSO}	± 21.5		± 30	V

Notes: 1. Pulse test: Pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.

Rating and Characteristic Curves (2N7002KDW-HF)

Fig.1 - Output Characteristics

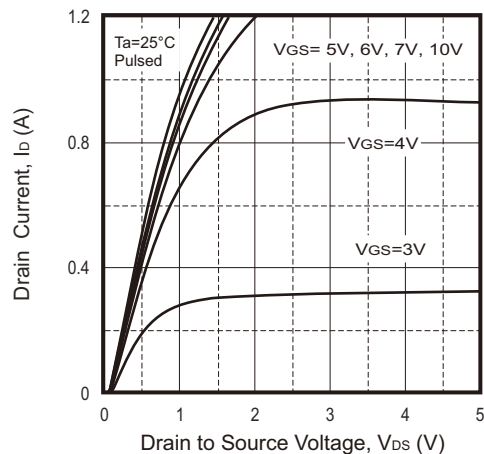


Fig.2 - Transfer Characteristics

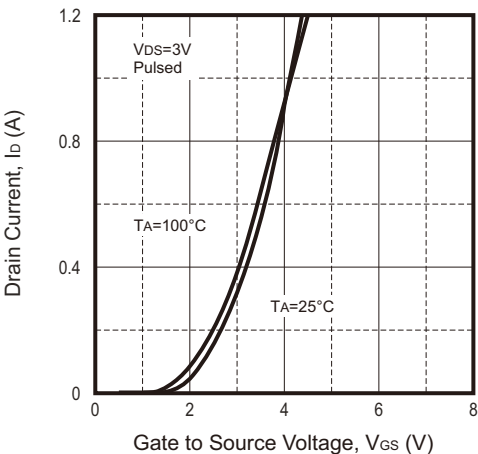


Fig.3 - $R_{DS(ON)}$ — I_D

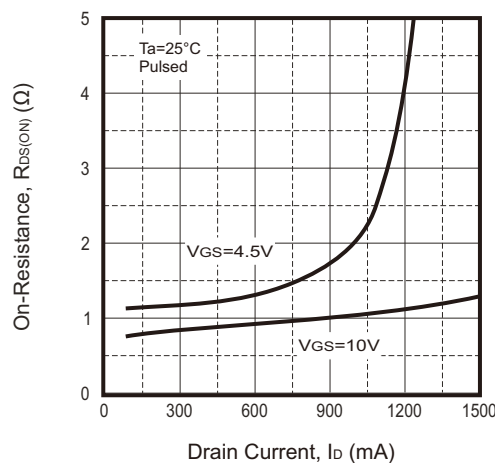


Fig.4 - $R_{DS(ON)}$ — V_{GS}

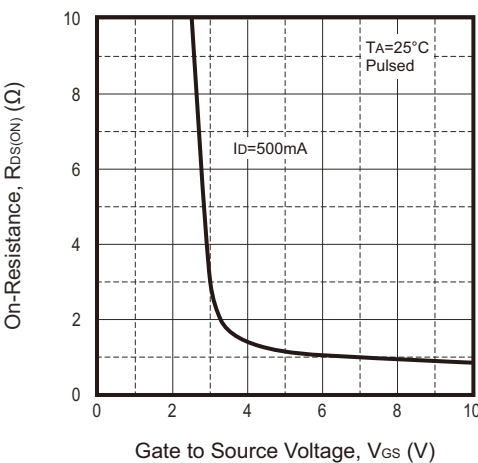


Fig.5 - I_S — V_{SD}

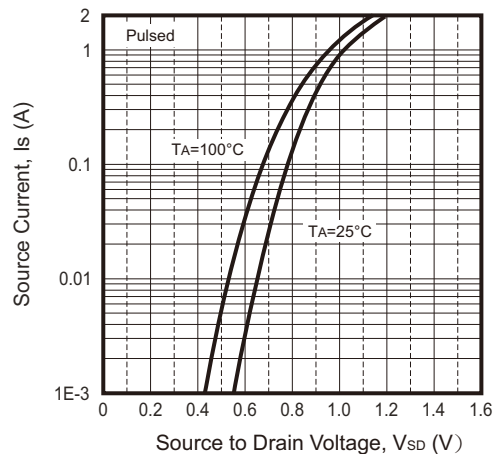
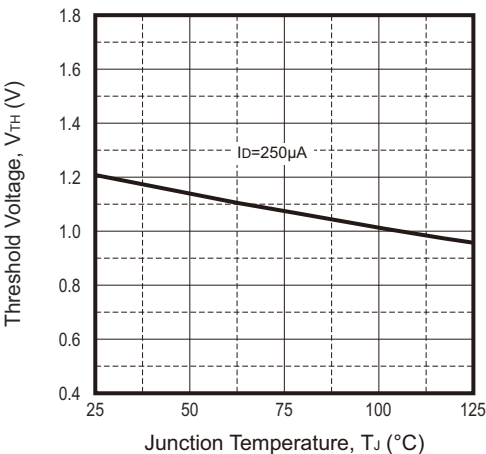
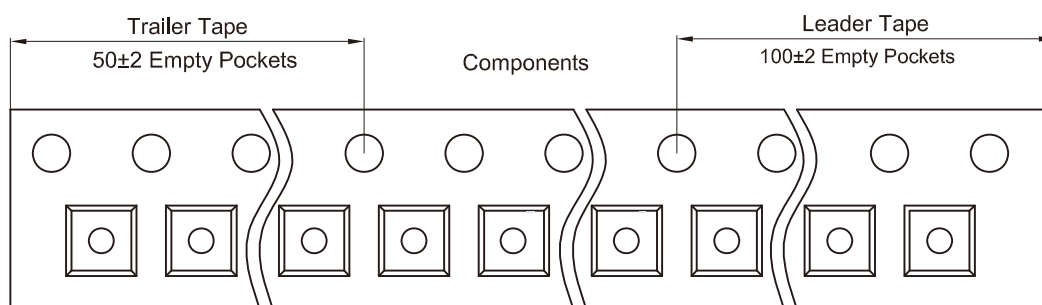
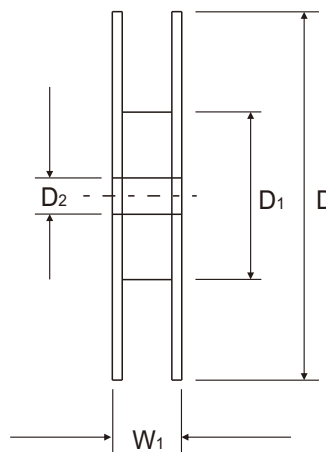
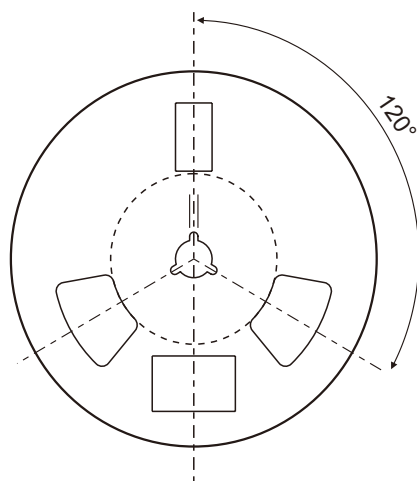
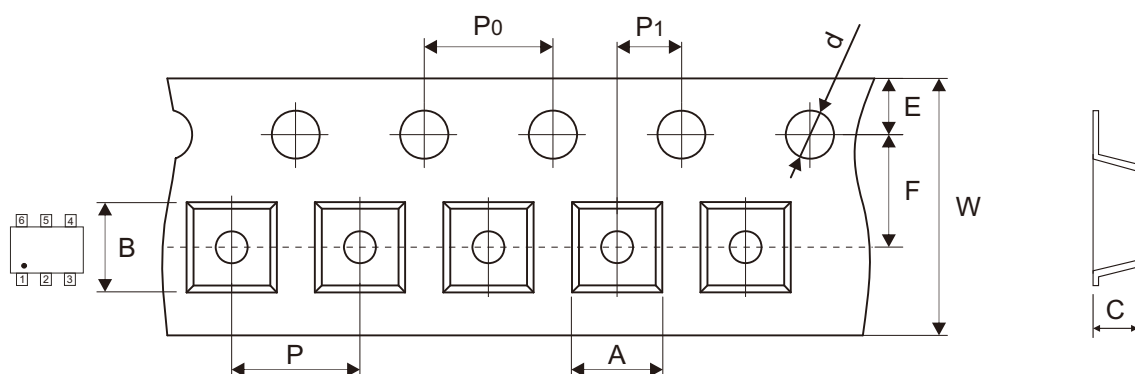


Fig.6 - Threshold Voltage



Reel Taping Specification

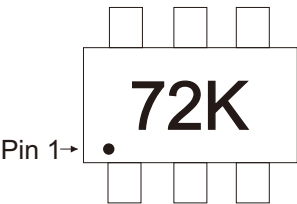


SOT-363	SYMBOL	A	B	C	d	D	D1	D2
	(mm)	2.40 ± 0.10	2.55 ± 0.10	1.20 ± 0.10	1.50 ± 0.10	178.00 ± 1.00	54.40 ± 0.50	13.00 ± 0.20
	(inch)	0.094 ± 0.004	0.100 ± 0.004	0.047 ± 0.004	0.059 ± 0.004	7.008 ± 0.039	2.142 ± 0.020	0.512 ± 0.008

SOT-363	SYMBOL	E	F	P	P0	P1	W	W1
	(mm)	1.75 ± 0.10	3.50 ± 0.05	4.00 ± 0.10	4.00 ± 0.10	2.00 ± 0.05	8.00 + 0.30 - 0.10	13.10 ± 1.30
	(inch)	0.069 ± 0.004	0.138 ± 0.002	0.157 ± 0.004	0.157 ± 0.004	0.079 ± 0.002	0.315 + 0.012 - 0.004	0.516 ± 0.051

Marking Code

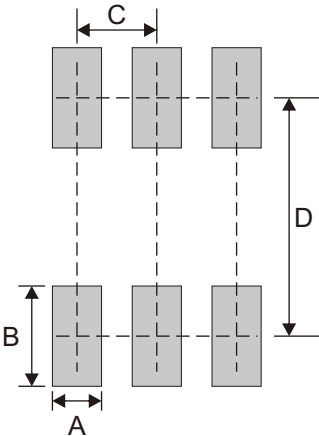
Part Number	Marking Code
2N7002KDW-HF	72K



Suggested P.C.B. PAD Layout

SIZE	SOT-363	
	(mm)	(inch)
A	0.40	0.016
B	0.816	0.032
C	0.65	0.026
D	1.94	0.076

Note: 1.The pad layout is for reference purposes only.



Standard Packaging

Case Type	REEL PACK	
	REEL (pcs)	Reel Size (inch)
SOT-363	3,000	7