SEMICONDUCTOR

2N7002KDW

N-Channel Enhancement MOSFET

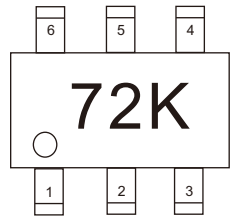
Features

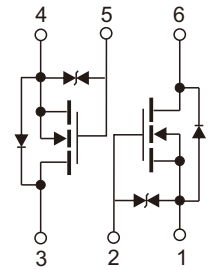
- High density cell design for low RDS(ON)
- Rugged and reliable
- High saturation current capability
- Voltage controlled small signal switch
- Low input Capacitance
- Fast Switching Speed

RoHS COMPLIANT

Product Summary		
V_{DS}	$R_{DS(on)}$ (Ω) Typ	I_D (mA)
60V	1.1@ 4.5V 0. 2A	340
	0.9@ 10V 0. 5A	

SOT-363





N-channel MOSFET

Mechanical Data

- Case:SOT-363
- Terminals:Plated solderable per MIL-STD-750,method 2026
- Mounting Position: Any
- Marking:72K

Absolute Maximum Ratings (T_A=25℃ unless otherwise noted)

Parameters	Symbol	Value	Unit
Drain-Source voltage	V_{DS}	60	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current .	I_D	340	mA
Pulsed Drain Current [1]	I_{DM}	1.5	A
Maximum Power Dissipation @T_A=25℃	P_D	150	mW
Junction and Storge Temperature Range	T_J,T_{STG}	-55 to +150	℃

Thermal Resistance Ratings

Parameters	Symbol	Typ	Max	Unit
Junction to Ambient，Steady State [2]	$R_{\theta JA}$	-	833	℃/W

Electrical Characteristics (T_J=25℃ unless otherwise noted)

Parameters	Symbol	Conditions	Min	Typ	Max	Unit
Static						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}= 0V, I_D=250μA	60	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=60V,V_{GS}=0V,T_C=25℃	-	-	1	μA
Gate-Source Leakage Current	I_{GSS}	V_{GS}= ±20V, V_{DS}=0V	-	-	±10	μA
Gate-Source Threshold Voltage	$V_{GS(th)}$	V_{DS}= V_{GS}, I_D=250μA	1.0	1.3	2.5	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}= 10V, I_D=500mA	-	0.9	5.0	Ω
		V_{GS}= 4.5V, I_D=200mA	-	1.1	5.3	
Dynamic						
Input Capacitance	C_{iss}	V_{DS}=10V,V_{GS}=0V,f=1MHz	-	-	40	pF
Output Capacitance	C_{oss}		-	-	30	
Reverse Transfer Capacitance	C_{rss}		-	-	10	
Total Gate Charge	Q_g	V_{DS}=30V,V_{GS}=10V,I_D=0.3A	-	1.65	-	nc
Gate-Source Charge	Q_{GS}		-	10.4	-	
Gate-Drain Charge	Q_{GD}		-	0.24	-	
Turn-on Delay Time	$t_{D(on)}$	V_{GS}=10V,V_{DD}=50V, R_{GEN}=50Ω,I_D=0.34A	-	-	10	ns
Turn-off Delay Time	$t_{D(off)}$		-	-	15	
Drain-Source Body Diode Characteristics						
Maximum Body-Diode Continuous Current	I_S		-	-	300	mA
Diode Forward Voltage	V_{SD}	I_S=0.3mA,V_{GS}=0V			1.2	V
Reverse recovery Time	t_{rr}	V_{GS}=0V,V_R=25V, di/dt=100A/μs,I_S=0.3A	-	30	-	ns

Notes: 1. Pulse Test: Pulse Width≤300us,Duty cycle ≤2%.
2.Device mounted on FR-4 PCB, 1 inch x 0.85 inch x 0.062 inch.

Typical Characteristics Diagrams

Figure 1.Output Characteristics

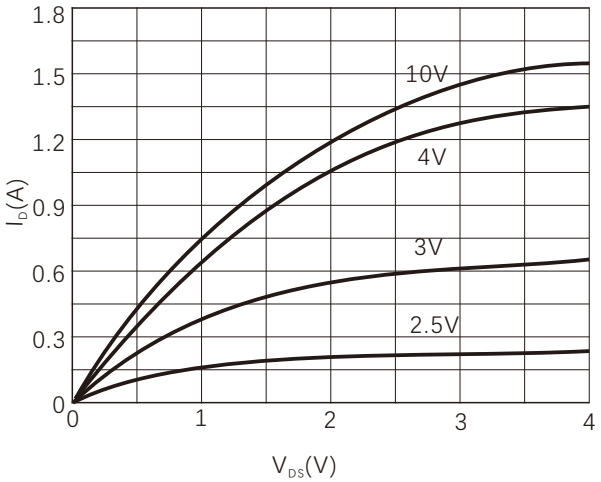


Figure 2. Transfer Characteristics

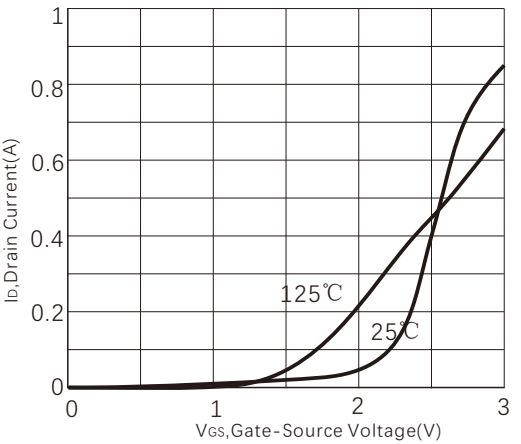


Figure 3.On-Resistance vs.Drain Current

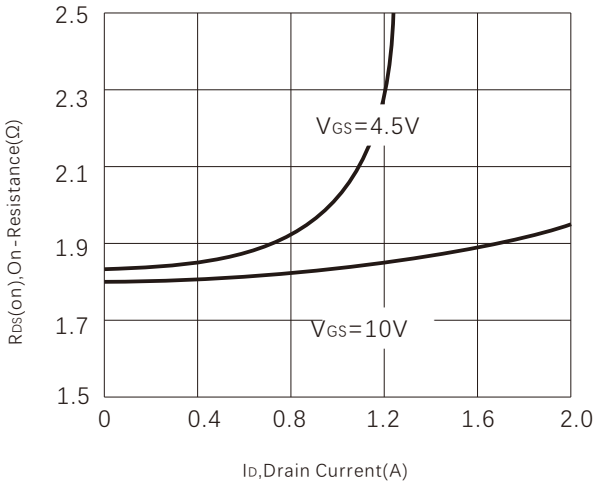
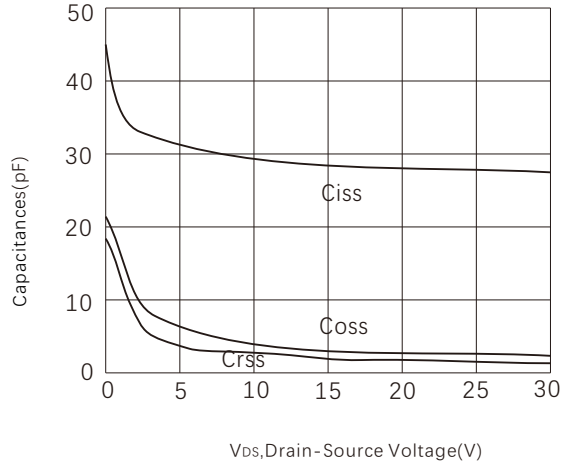


Figure 4. Capacitance



Typical Characteristics Diagrams

Figure 5.Gate charge

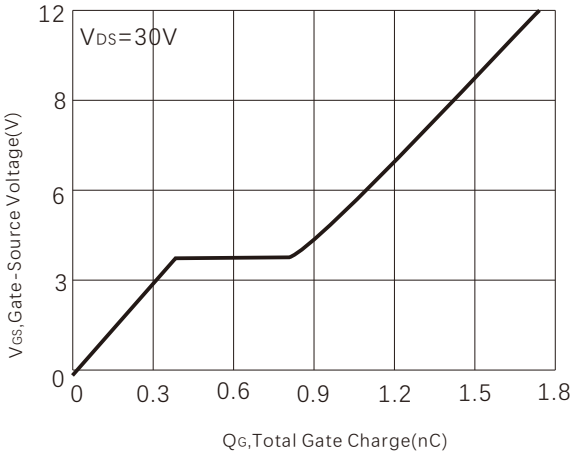


Figure6.Normalized $R_{DS(ON)}$ vs Junction Temperature

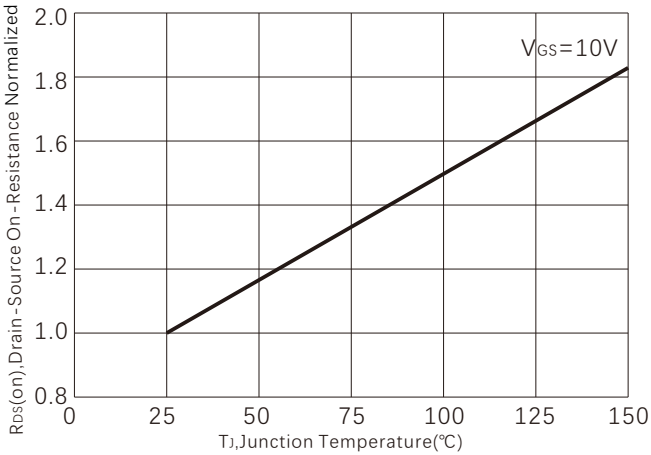


Figure 7. Safe operating area

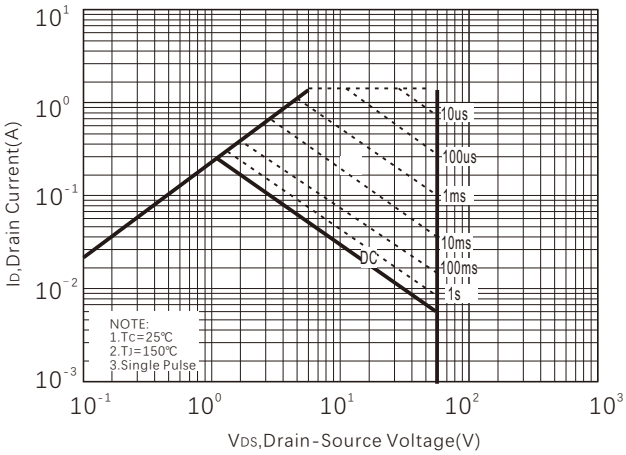
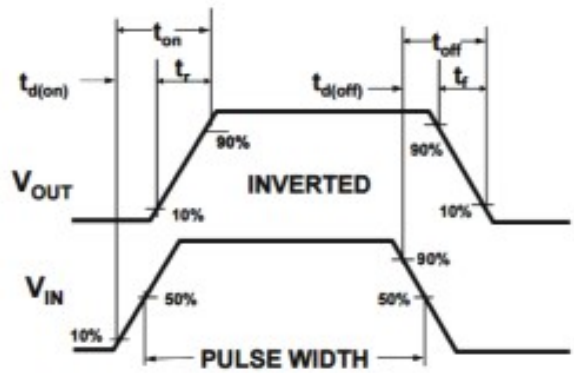
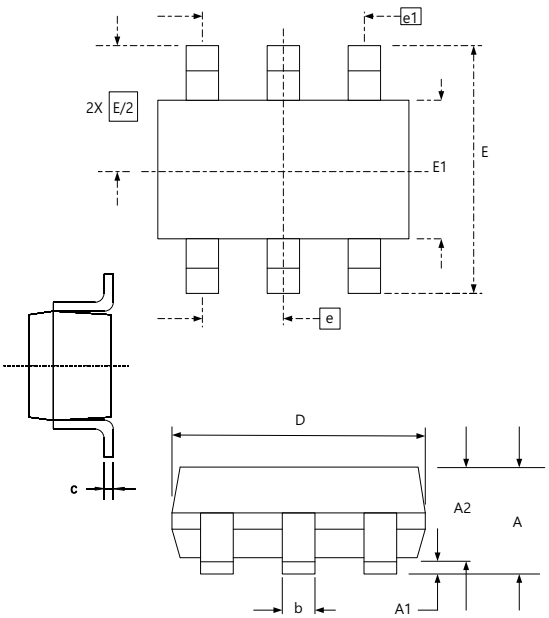


Figure8.Switching wave



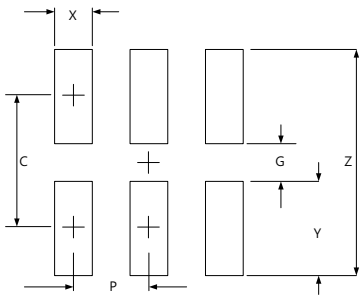
PACKAGE OUTLINE DIMENSIONS

SOT-363



SYM	DIMENSIONS					
	MILLIMETERS			INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.90		1.10	0.035		0.043
A1	0.00		0.10	0.000		0.004
A2	0.70	0.90	1.00	0.028	0.035	0.039
b	0.15		0.35	0.006		0.014
c	0.08		0.25	0.003		0.010
D	1.80	2.00	2.20	0.071	0.079	0.087
E1	1.15	1.25	1.35	0.045	0.049	0.053
E	2.15	2.30	2.45	0.085	0.091	0.096
e	0.65 BSC			0.026 BSC		
e1	1.30 BSC			0.051 BSC		

Suggested pad layout



SYM	DIMENSIONS	
	MILLIMETERS	INCHES
C	1.85	0.073
G	1.00	0.039
P	0.65	0.026
X	0.40	0.016
Y	0.85	0.033
Z	2.70	0.106

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