MOSFET

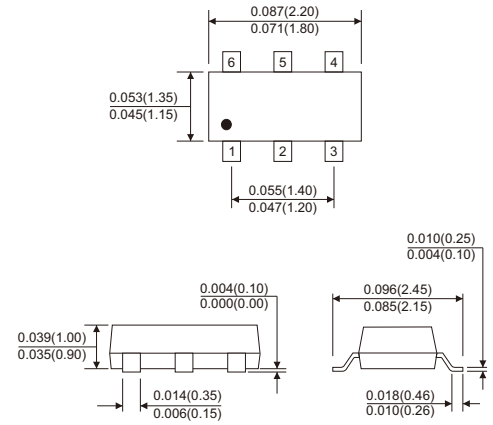
2N7002DW-HF

N-Channel
RoHS Device
Halogen Free

Features

- Voltage controlled small signal switch.
- Low input capacitance.
- Fast switching speed.
- Low input / output leakage.

SOT-363



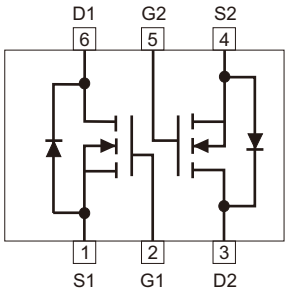
Dimensions in inches and (millimeter)

Mechanical data

- Case: SOT-363, molded plastic.
- Mounting position: Any.

Circuit Diagram

G : Gate
S : Source
D : Drain



Maximum Ratings (at Ta=25°C unless otherwise noted)

Parameter		Symbol	Value	Unit
Drain-source voltage		V_{DS}	60	V
Gate-source voltage		V_{GS}	±30	V
Drain current	T_A=25°C @ steady state	I_D	340	mA
	T_A=70°C @ steady state		272	
Pulsed drain current (Note 1)		I_{DM}	1.5	A
Total power dissipation @ T_A=25°C		P_D	150	mW
Thermal resistance junction to ambient @ steady state (Note 2)		$R_{\theta JA}$	833	°C/W
Junction and storage temperature range		T_J, T_{STG}	-55 to +150	°C

Notes: 1. Pulse width ≤ 300μs, duty cycle ≤ 2%.
2. Device mounted on FR-4 PCB, 1 inch x 0.85 inch x 0.062 inch.

Electrical Characteristics (at T_J=25°C unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Static Parameters						
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			1	μA
Gate-body leakage current	I_{GSS}	V_{GS} = ±30V, V_{DS} = 0V			±100	nA
		V_{GS} = ±20V, V_{DS} = 0V			±50	
Gate threshold voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250μA	1	1.6	2.5	V
Static drain-source on-resistance	$R_{DS(ON)}$	V_{GS} = 10V, I_D = 300mA		1.2	2.5	Ω
		V_{GS} = 4.5V, I_D = 200mA		1.3	3.0	
Forward transconductance	g_{FS}	V_{DS} = 10V, I_D = 200mA	80			ms
Diode forward voltage	V_{SD}	I_S = 300mA, V_{GS} = 0V			1.2	V
Max. body-diode continuous current	I_S				340	mA
Dynamic Parameters						
Input capacitance	C_{iss}	V_{DS} = 30V, V_{GS} = 0V, f = 1MHz		27.5		pF
Output capacitance	C_{oss}			2.75		
Reverse transfer capacitance	C_{rss}			1.9		
Switching Parameters						
Total gate charge	Q_g	V_{GS} = 10V, V_{DS} = 30V, I_D = 0.3A		1.6		nC
Gate-source charge	Q_{gs}			0.47		
Gate-drain charge	Q_{gd}			0.25		
Reverse recovery charge	Q_{rr}	I_F = 0.3A, di / dt = -100A/μs		2.5		
Reverse recovery time	t_{rr}			11.5		ns
Turn-on delay time	$t_{d(on)}$	V_{GS} = 10V, V_{DD} = 30V, I_D = 300mA, R_{GEN} = 6Ω		3.3		
Turn-on rise time	t_r			19		
Turn-off delay time	$t_{d(off)}$			9.6		
Turn-off fall time	t_f			49		

Typical Rating and Characteristic Curves (2N7002DW-HF)

Fig.1 - Output Characteristics

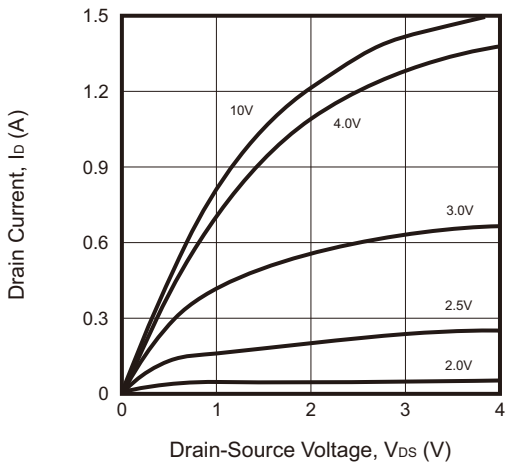


Fig.2 - Transfer Characteristics

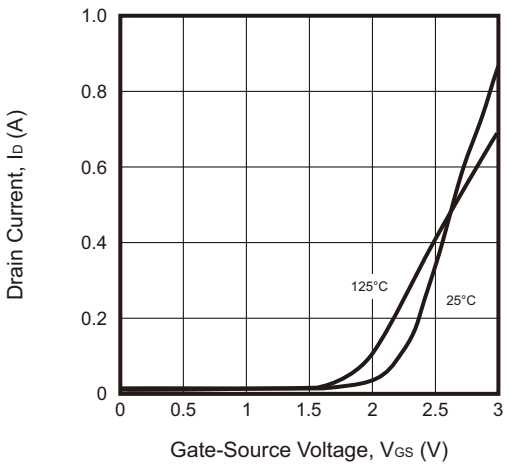


Fig.3 - Capacitance Characteristics

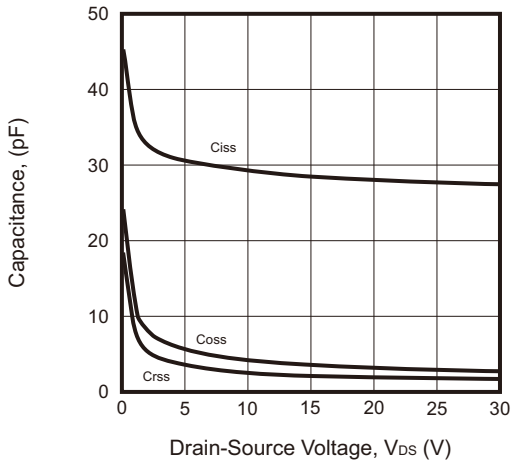


Fig.4 - Gate Charge

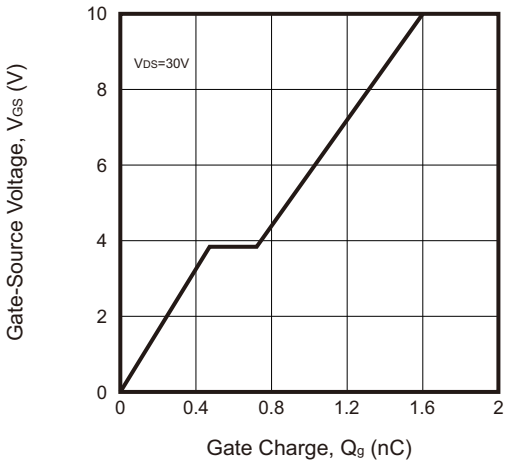


Fig.5 - Drain-Source on Resistance

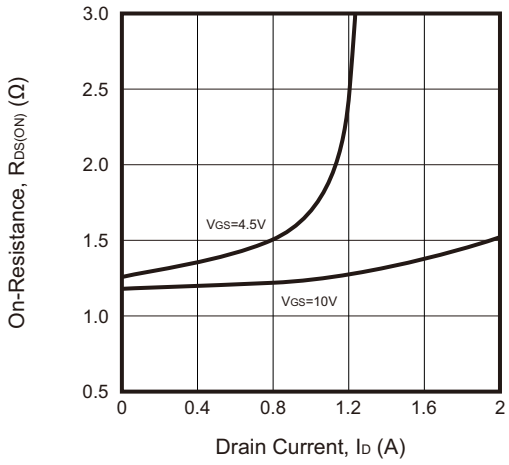
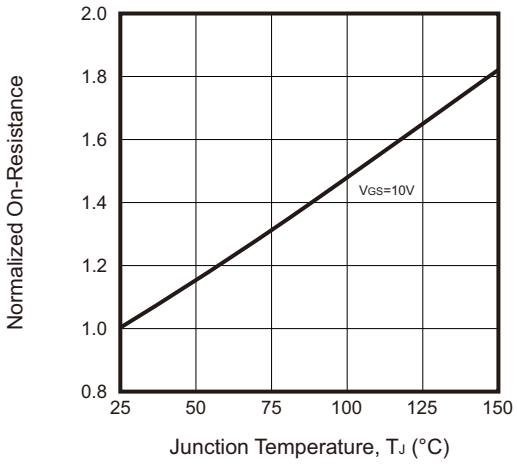
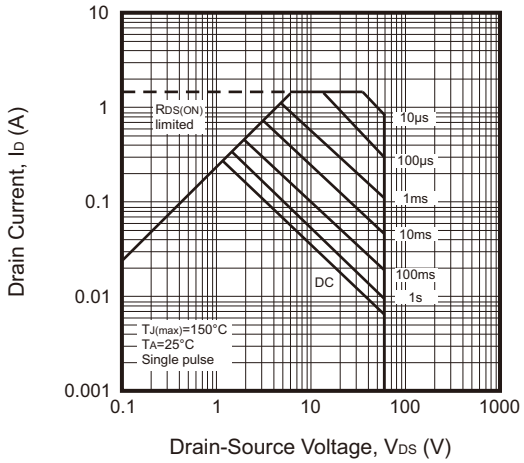


Fig.6 - Drain-Source on Resistance

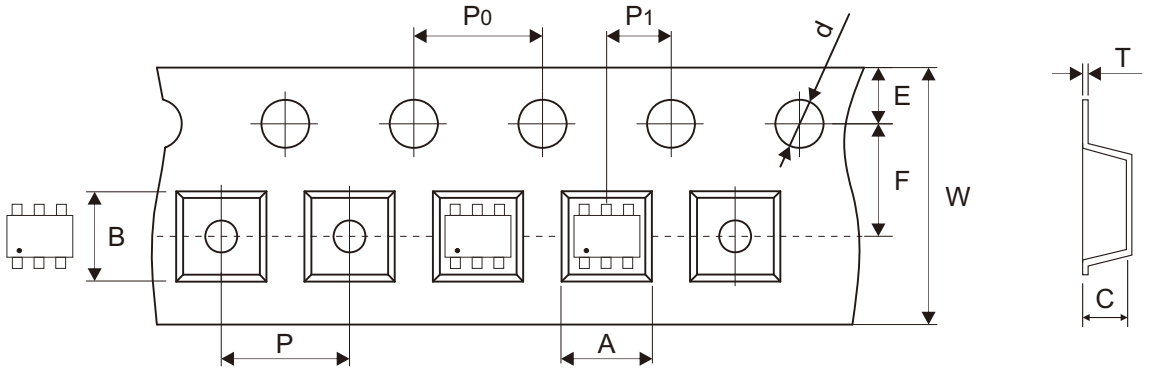


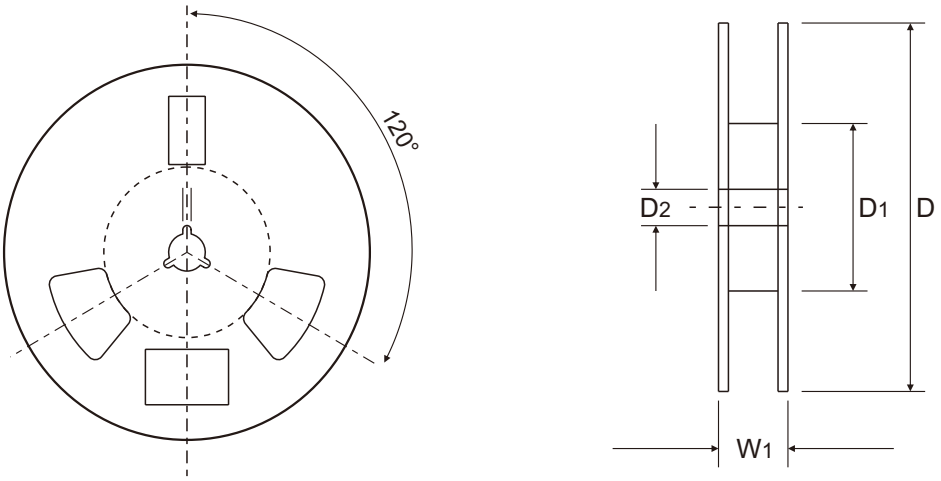
Typical Rating and Characteristic Curves (2N7002DW-HF)

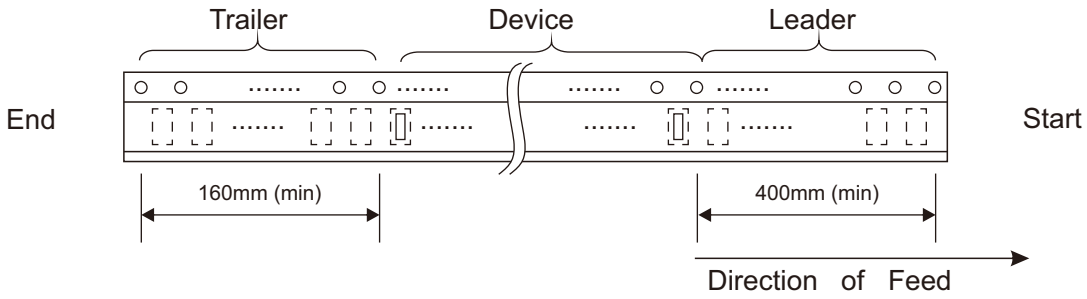
Fig.7 - Safe Operation Area



Reel Taping Specification





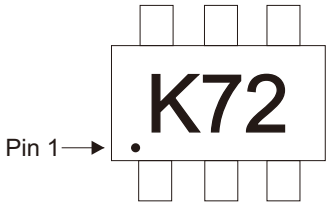


	SYMBOL	A	B	C	d	D	D1	D2
SOT-363	(mm)	2.30 ± 0.10	2.55 ± 0.10	1.15 ± 0.10	1.55 ± 0.05	178.00 ± 2.00	54.40 ± 1.00	13.00 ± 1.00
	(inch)	0.091 ± 0.004	0.100 ± 0.004	0.045 ± 0.004	0.061 ± 0.002	7.008 ± 0.079	2.142 ± 0.039	0.512 ± 0.039

	SYMBOL	E	F	P	P0	P1	T	W	W1
SOT-363	(mm)	1.75 ± 0.10	3.50 ± 0.10	4.00 ± 0.10	4.00 ± 0.10	2.00 ± 0.05	0.20 ± 0.03	8.00 + 0.20 − 0.10	12.30 ± 1.00
	(inch)	0.069 ± 0.004	0.138 ± 0.004	0.157 ± 0.004	0.157 ± 0.004	0.079 ± 0.002	0.008 ± 0.001	0.315 + 0.008 − 0.004	0.484 ± 0.039

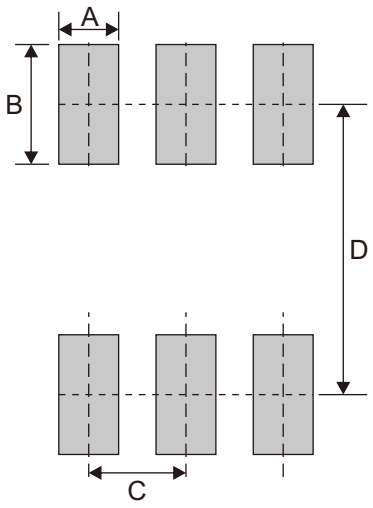
Marking Code

Part Number	Marking Code
2N7002DW-HF	K72



Suggested P.C.B. PAD Layout

SIZE	SOT-363	
	(mm)	(inch)
A	0.40	0.016
B	0.80	0.031
C	0.65	0.026
D	1.94	0.076



Standard Packaging

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