

October 2007

2N7002DW

N-Channel Enhancement Mode Field Effect Transistor

Features

- Dual N-Channel MOSFET
- · Low On-Resistance
- · Low Gate Threshold Voltage
- Low Input Capacitance
- · Fast Switching Speed
- Low Input/Output Leakage
- Ultra-Small Surface Mount Package
- · Lead Free/RoHS Compliant

SC70-6 (SOT363)





Marking: 2N

Absolute Maximum Ratings * T_a = 25°C unless otherwise noted

Symbol	Parameter		Value	Units	
V _{DSS}	Drain-Source Voltage		60	V	
V _{DGR}	Drain-Gate Voltage $R_{GS} \le 1.0 M\Omega$		60	V	
V_{GSS}	Gate-Source Voltage	Continuous Pulsed	±20 ±40	V	
I _D	Drain Current	Continuous Continuous @ 100°C Pulsed	115 73 800	mA	
T_{J} , T_{STG}	Junction and Storage Temperature Range		-55 to +150	°C	

^{*} These ratings are limiting values above which the serviceability of any semiconductor device may by impaired.

Thermal Characteristics

Symbol	Parameter	Value	Units	
P _D	Total Device Dissipation Derating above TA = 25°C	200 1.6	mW mW/°C	
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient *	625	°C/W	

^{*} Device mounted on FR-4 PCB, 1 inch x 0.85 inch x 0.062 inch, Minimun land pad size,

Electrical Characteristics $T_C = 25$ °C unless otherwise noted

Symbol	Parameter	Test Condition	MIN	TYP	MAX	Units
Off Charac	teristics (Note1)					
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} = 0V, I _D =10uA	60	78	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} = 60V, V _{GS} = 0V V _{DS} = 60V, V _{GS} = 0V, @T _C = 125°C	-	0.001 7	1.0 500	uA
I _{GSS}	Gate-Body Leakage	V _{GS} = ±20V, V _{DS} = 0V	-	0.2	±10	nA
On Charac	teristics (Note1)					
V _{GS(th)}	Gate Threshold Voltage	$V_{DS} = V_{GS}, I_{D} = 250uA$	1.0	1.76	2.0	V
R _{DS(ON)}	Satic Drain-Source On-Resistance	$V_{GS} = 5V, I_D = 0.05A,$ $V_{GS} = 10V, I_D = 0.5A, @T_j = 125°C$	-	1.6 2.53	7.5 13.5	Ω
I _{D(ON)}	On-State Drain Current	V _{GS} = 10V, V _{DS} = 7.5V	0.5	1.43	-	А
9 _{FS}	Forward Transconductance	V _{DS} = 10V, I _D = 0.2A	80	356.5	-	mS
Dynamic (Characteristics					
C _{iss}	Input Capacitance		-	37.8	50	pF
C _{oss}	Output Capacitance	V _{DS} = 25V, V _{GS} = 0V, f = 1.0MHz	-	12.4	25	pF
C _{rss}	Reverse Transfer Capacitance		-	6.5	7.0	pF
Switching	Characteristics					
t _{D(ON)}	Turn-On Delay Time	$V_{DD} = 30V, I_{D} = 0.2A, V_{GEN} = 10V$	-	5.85	20	no
t _{D(OFF)}	Turn-Off Delay Time	$R_L = 150\Omega$, $R_{GEN} = 25\Omega$	-	12.5	20	ns

Note1 : Short duration test pulse used to minimize self-heating effect.

Typical Performance Characteristics

Figure 1. On-Region Characteristics

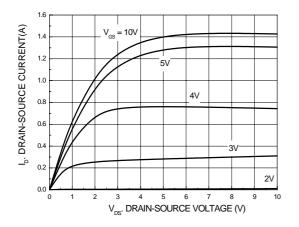


Figure 3. On-Resistance Variation with Temperature

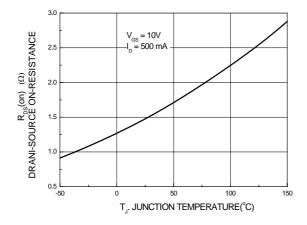


Figure 5. Transfer Characteristics

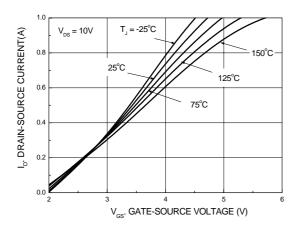


Figure 2. On-Resistance Variation with Gate Voltage and Drain Current

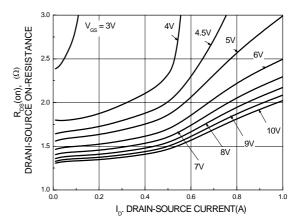


Figure 4. On-Resistance Variation with Gate-Source Voltage

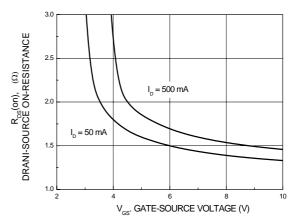
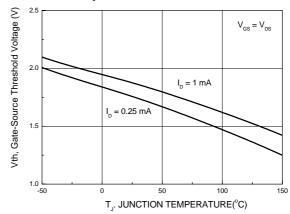


Figure 6. Gate Threshold Variation with Temperature



Typical Performance Characteristics

Figure 7. Reverse Drain Current Variation with Diode Forward Voltage and Temperature

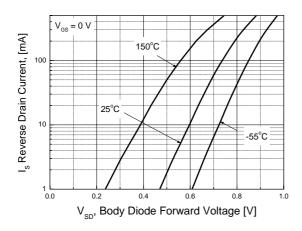
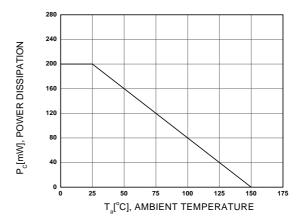
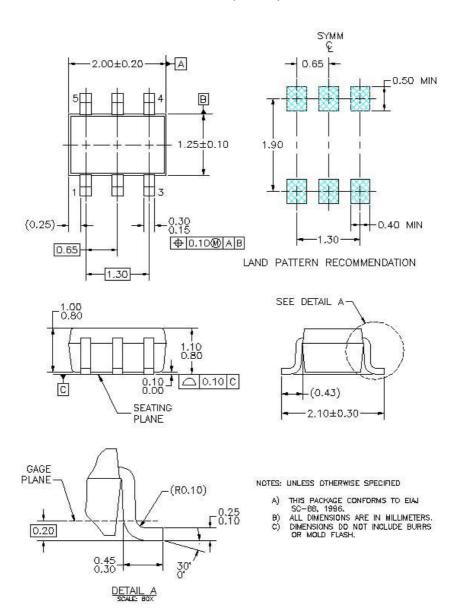


Figure 8. Power Derating



Package Dimensions

SC70-6 (SOT-363)







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