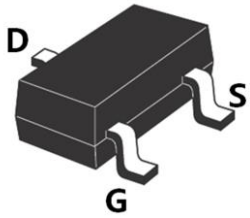
Silicon N-Channel Power MOSFET

General Description:

The HMZ8P03 uses advanced trench technology and design to provide excellent $R_{DS(ON)}$ with low gate charge. It can be used in a wide variety of applications. The package form is SOT-23, which accords with the RoHS standard.

V_{DSS}	-30	V
I_D	-8	A
P_D	1.2	W
$R_{DS(ON)MAX}$	30	mΩ

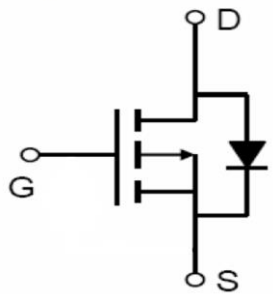
SOT-23



Features:

- $R_{DS(ON)}$ <30mΩ @ V_{GS}=10V
- High density cell design for ultra low R_{dson}
- Fully characterized avalanche voltage and current
- Excellent package for good heat dissipation

Inner Equivalent Principium Chart



Applications:

- Power switching application
- Hard switched and high frequency circuits
- Uninterruptible power supply

Absolute (Tc= 25℃ unless otherwise specified):

Symbol	Parameter	Rating	Units
V_{DSS}	Drain-to-Source Voltage	-30	V
I_D	Continuous Drain Current	-8	A
V_{GS}	Gate-to-Source Voltage	±12	V
P_D	Power Dissipation	1.2	W
T_J, T_{stg}	Operating Junction and Storage Temperature Range	150, −55 to 150	℃

Symbol	Parameter	Typ.	Units
$R_{\theta JA}$	Junction-to-Ambient[a2]	104.1	℃/W

Electrical Characteristics (Tc= 25℃ unless otherwise specified):

OFF Characteristics						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
V_{DSS}	Drain to Source Breakdown Voltage	V_{GS}=0V, I_D=-250μA	-30	--	--	V
I_{DSS}	Drain to Source Leakage Current	V_{DS}=-24V, V_{GS}= 0V,T_a=25℃	--	--	-1.0	μA
$I_{GSS(F)}$	Gate to Source Forward Leakage	V_{GS}=+12V	--	--	0.1	μA
$I_{GSS(R)}$	Gate to Source Reverse Leakage	V_{GS}=-12V	--	--	-0.1	μA

ON Characteristics						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
$R_{DS(ON)1}$	Drain-to-Source On-Resistance[a1]	V_{GS}=-10V,I_D=-4.2A	--	--	30	mΩ
$R_{DS(ON)2}$	Drain-to-Source On-Resistance[a1]	V_{GS}=-4.5V,I_D=-3.5A	--	--	35	mΩ
$R_{DS(ON)3}$	Drain-to-Source On-Resistance[a1]	V_{GS}=-2.5V,I_D=-1A	--	--	40	mΩ
$V_{GS(TH)}$	Gate Threshold Voltage	V_{DS}=V_{GS},I_D=250μA	-0.5	--	-1.3	V
Pulse width tp≤380μs,δ≤2%						

Dynamic Characteristics						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
g_{fs}	Forward Transconductance[a1]	V_{DS}=-5V,I_D=-5A	14	--	--	S
C_{iss}	Input Capacitance[a2]	V_{GS}=0V,V_{DS}=-15V f=1.0MHz	--	1950	--	pF
C_{oss}	Output Capacitance[a2]		--	210	--	
C_{rss}	Reverse Transfer Capacitance[a2]		--	150	--	

Resistive Switching Characteristics[a2]						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
$t_{d(ON)}$	Turn-on Delay Time	V_{DD}=-15V,R_L=-3.6Ω V_{GS}=-10V,R_G=6Ω	--	--	12	ns
t_r	Rise Time		--	--	6.4	
$t_{d(OFF)}$	Turn-Off Delay Time		--	--	75	
t_f	Fall Time		--	--	24	

Source-Drain Diode Characteristics						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
V_{SD}	Diode Forward Voltage[a1]	I_S=-4A,V_{GS}=0V	--	--	-1	V

[a1]: Pulse Test: Pulse Width≤300μs, Duty Cycle≤2%.
[a2]: These parameters have no way to verify

Characteristics Curve:

Typical Electrical and Thermal Characteristics

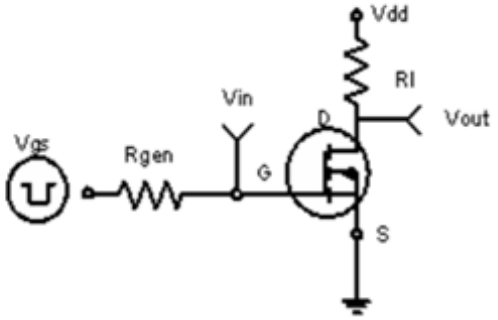


Figure 1:Switching Test Circuit

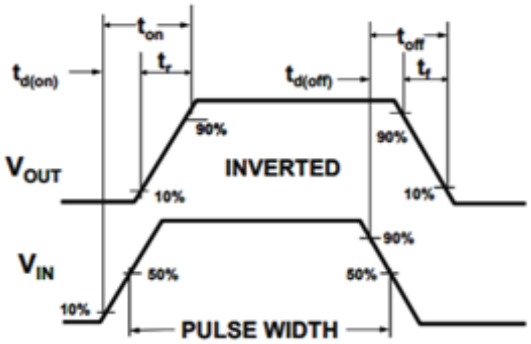
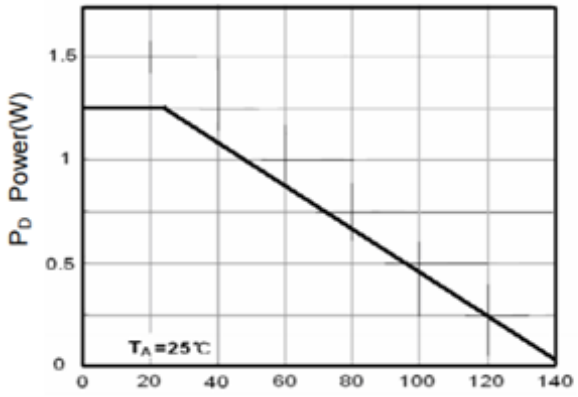
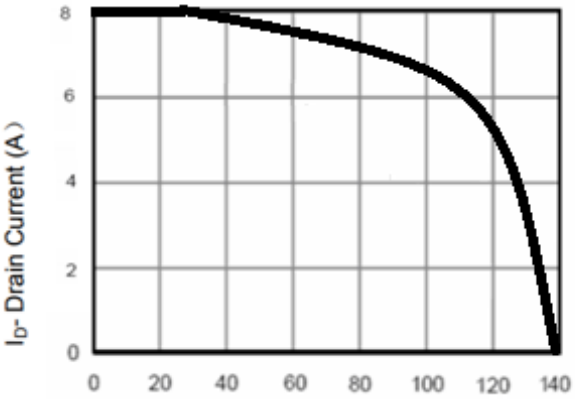


Figure 2:Switching Waveforms



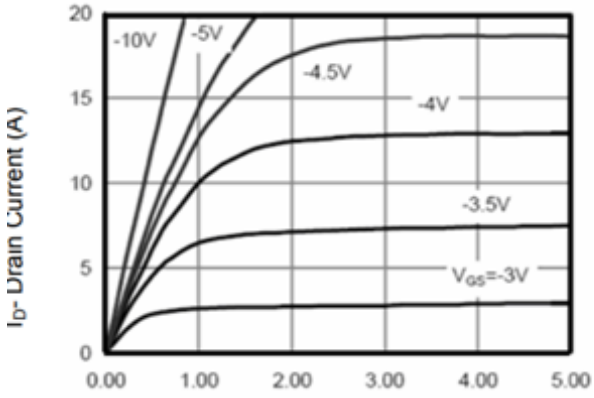
T_J-Junction Temperature(℃)

Figure 3 Power Dissipation



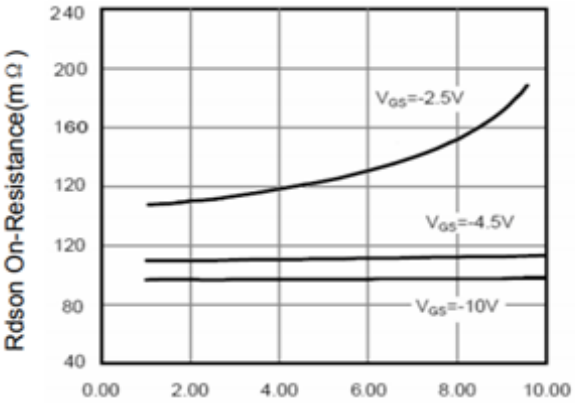
T_J-Junction Temperature(℃)

Figure 4 Drain Current



Vds Drain-Source Voltage (V)

Figure 5 Output Characteristics



I_D- Drain Current (A)

Figure 6 Drain-Source On-Resistance

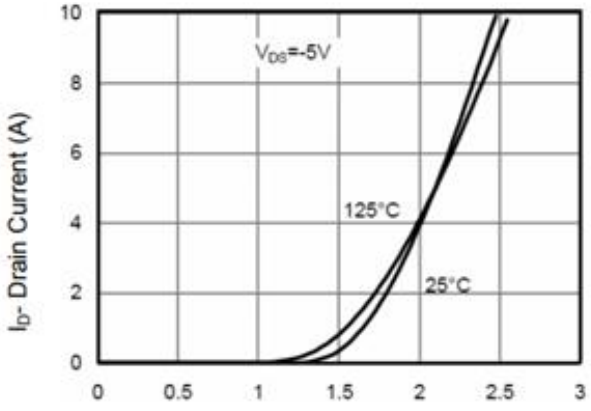


Figure 7 Transfer Characteristics

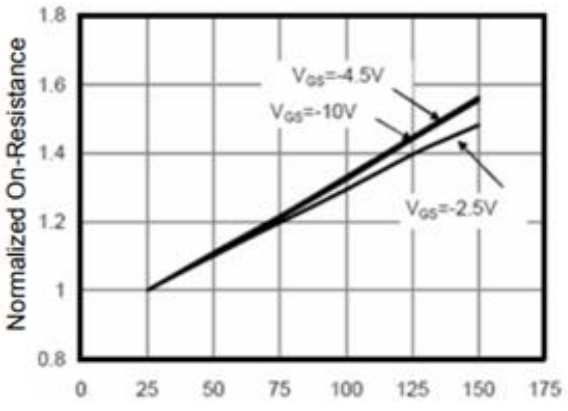


Figure 8 Drain-Source On-Resistance

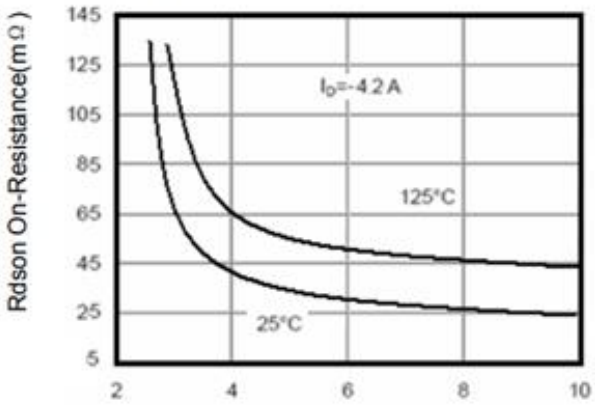


Figure 9 Rdson vs Vgs

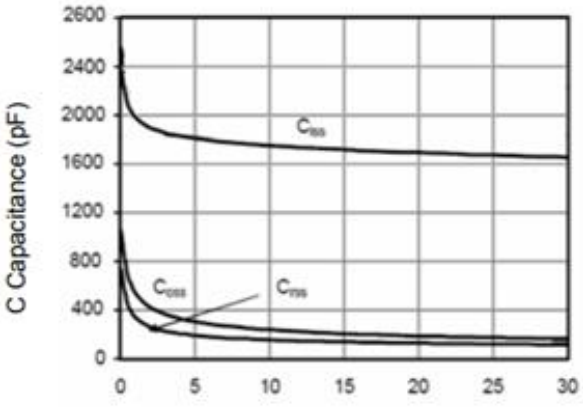


Figure 10 Capacitance vs Vds

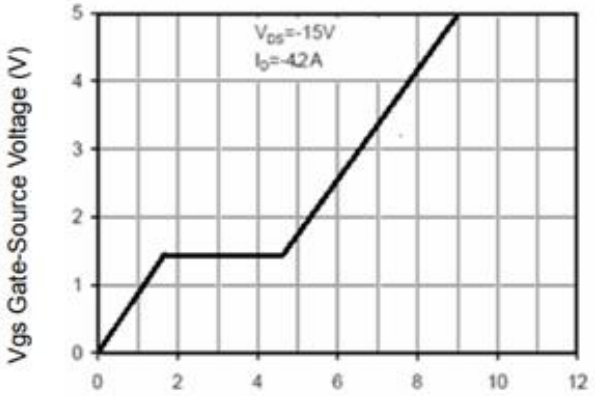


Figure 11 Gate Charge

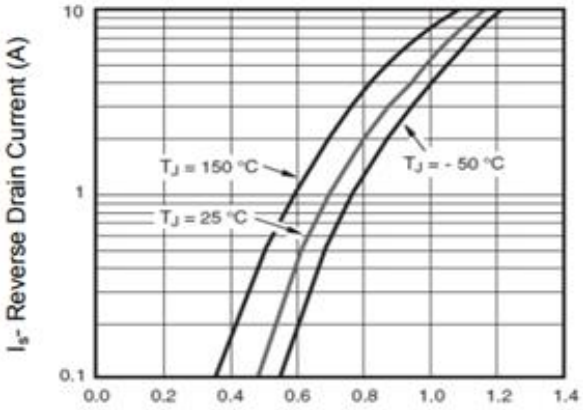


Figure 12 Source- Drain Diode Forward

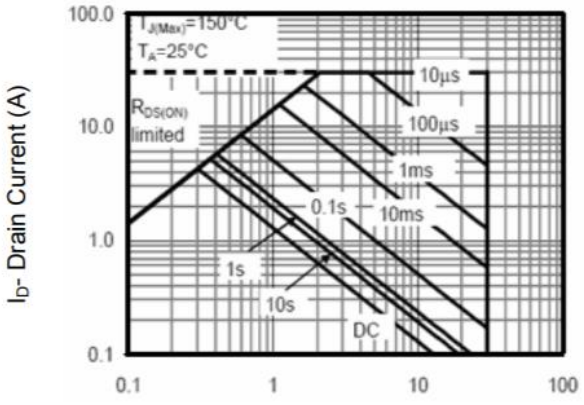


Figure 13 Safe Operation Area

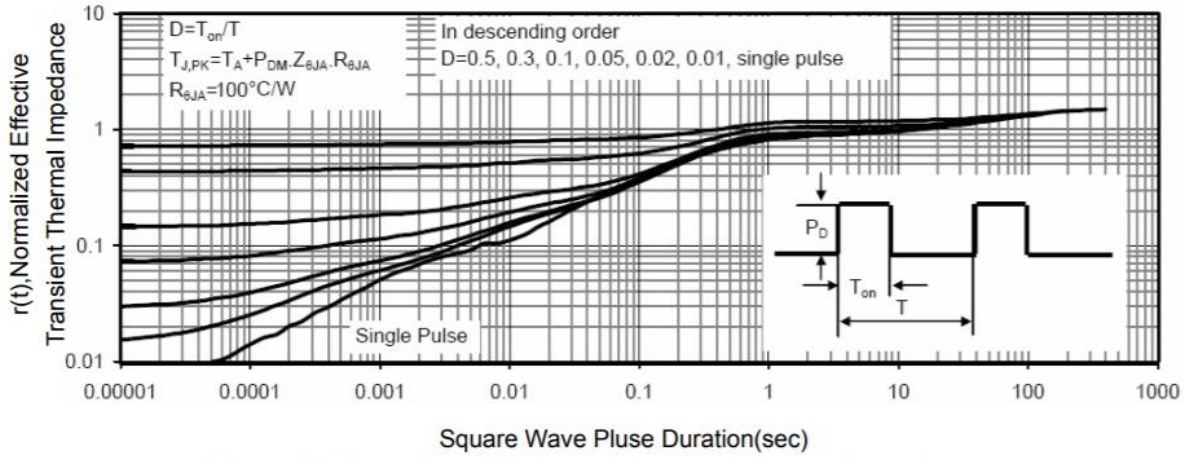


Figure 14 Normalized Maximum Transient Thermal Impedance