

Description

The DMG6968U uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 2.5V. This device is suitable for use as a

Battery protection or in other Switching application.



SOT-23

General Features

 $V_{DS} = 20V I_D = 6 A$

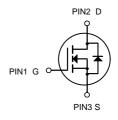
 $R_{DS(ON)}$ < 27m Ω @ V_{GS} =4.5V

Application

Battery protection

Load switch

Uninterruptible power supply



N-Channel MOSFET

Package Marking and Ordering Information

Product ID	Pack	Brand	Qty(PCS)
DMG6968U	SOT-23	HXY MOSFET	3000

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

Symbol	Paramete	Limit	Unit		
V _{DS}	Drain-Source Voltage		20	V	
V _{GS}	Gate-Source Voltage		±12	V	
I _D	Continuous Drain Current	T _A =25°C	6	_	
		T _A =70°C	3.6	A	
Ірм	Drain Current-Pulsed (Note 1)		15	Α	
P _D	Maximum Power Dissipation		1.25	W	
Т,,Тѕтс	Operating Junction and Storage Temperature Range		-55 To 150	$^{\circ}$	
Reja	Thermal Resistance,Junction-to-Ambient (Note 2)		100	°C/W	



Electrical Characteristics (T_A=25°C unless otherwise noted)

Parameter	Symbol	Condition	Min	Тур	Max	Unit
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V I _D =250μA	20	22.5	-	V
Zero Gate Voltage Drain Current	IDSS	V _{DS} =20V,V _{GS} =0V	-	-	1	μA
Gate-Body Leakage Current	Igss	V _{GS} =±12V,V _{DS} =0V	-	-	±100	nA
Gate Threshold Voltage	V _{GS} (th)	V _{DS} =V _{GS} ,I _D =250μA	0.5	0.65	1.0	V
		V _{GS} =4.5V, I _D =4.0 A	-	22	27	mΩ
Drain-Source On-State Resistance	RDS(ON)	V _{GS} =2.5V, I _D =4.5A	-	28	40	mΩ
Forward Transconductance	g FS	V _{DS} =10V,I _D =4A	-	10	-	S
Input Capacitance	Clss		-	500	-	PF
Output Capacitance	Coss	V _{DS} =8V,V _{GS} =0V,	-	295	-	PF
Reverse Transfer Capacitance	C _{rss}	F=1.0MHz	-	96	-	PF
Turn-on Delay Time	t d(on)		-	11	-	nS
Turn-on Rise Time	t _r	V _{DD} =10V,I _D =1A	-	30	-	nS
Turn-Off Delay Time	td(off)	V_{GS} =4.5V,R _{GEN} =6 Ω	-	35	-	nS
Turn-Off Fall Time	t _f		-	10	-	nS
Total Gate Charge	Qg		-	10	15	nC
Gate-Source Charge	Q _{gs}	V _{DS} =10V,I _D =3A,V _{GS} =4.5V	-	2.3	-	nC
Gate-Drain Charge	Q _{gd}		-	2.9	-	nC
Diode Forward Voltage (Note 3)	VsD	V _{GS} =0V,I _S =1A	-	-	1.2	V
Diode Forward Current (Note 2)	Is		-	-	4.5	Α

Notes:

- 1. Repetitive rating: pulse width limited by maximum junction temperature.
- **2.** Surface mounted on FR4 Board, $t \le 10$ sec.
- **3.** Pulse test: pulse width \leq 300 μ s, duty cycle \leq 2%.
- 4. Guaranteed by design, not subject to production



Typical Electrical and Thermal Characteristics

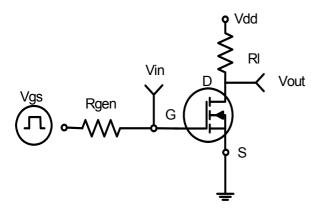
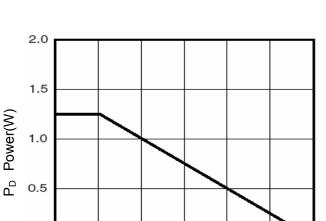


Figure 1:Switching Test Circuit



T_J-Junction Temperature(°C)

50

0.0

0

25

Figure 3 Power Dissipation

75

100

125

150

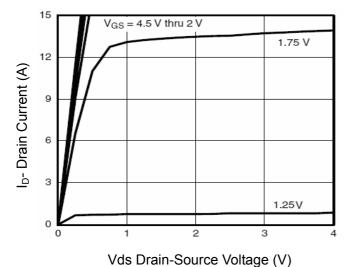


Figure 5 Output Characteristics

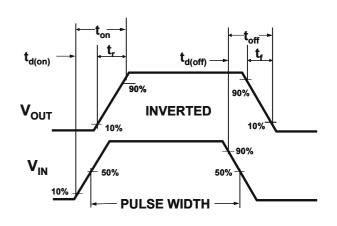
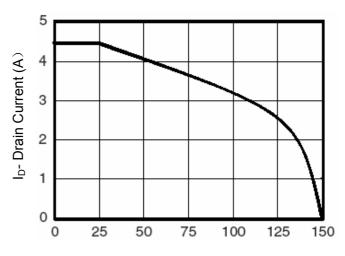


Figure 2:Switching Waveforms



 $T_{J}\text{-Junction Temperature}({}^{\circ}\!\mathbb{C}\,)$

Figure 4 Drain Current

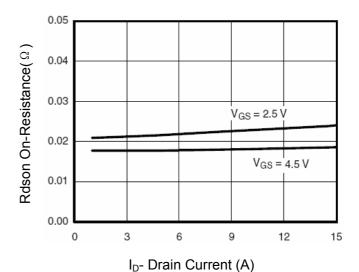


Figure 6 Drain-Source On-Resistance



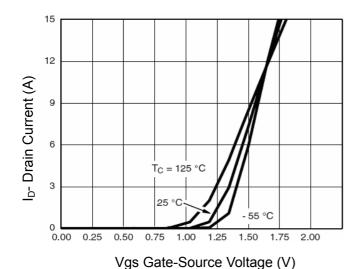
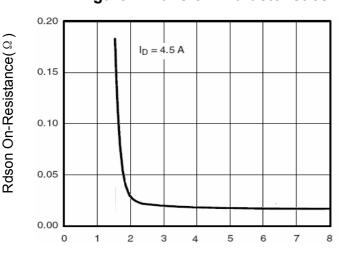


Figure 7 Transfer Characteristics



Vgs Gate-Source Voltage (V)
Figure 9 Rdson vs. Vgs

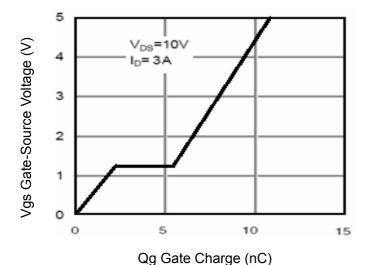


Figure 11 Gate Charge

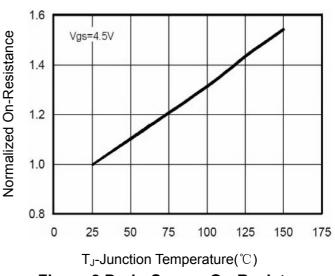


Figure 8 Drain-Source On-Resistance

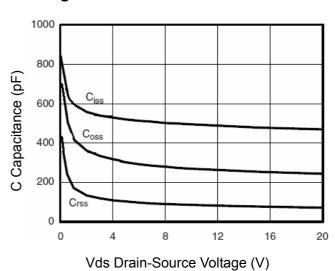


Figure 10 Capacitance vs Vds

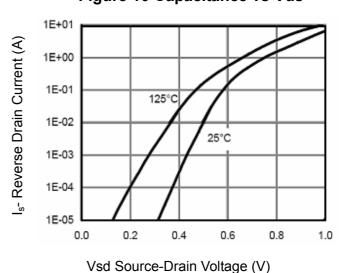
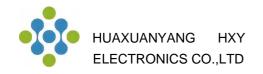
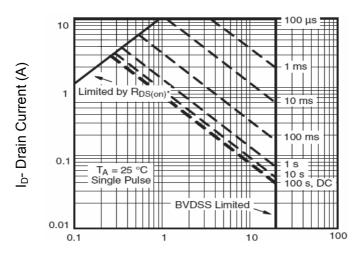


Figure 12 Source- Drain Diode Forward





Vds Drain-Source Voltage (V)

Figure 13 Safe Operation Area

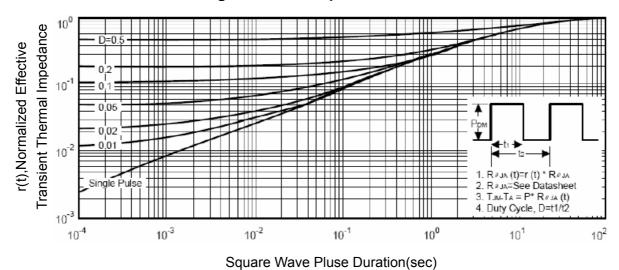
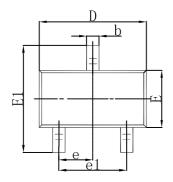
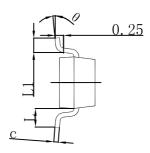


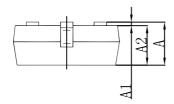
Figure 14 Normalized Maximum Transient Thermal Impedance



SOT-23 Package Outline Dimensions

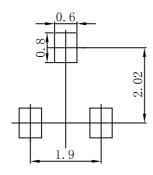






Symbol	Dimensions In Millimeters		Dimensions In Inches		
	Min	Max	Min	Max	
A	0.900	1.150	0.035	0.045	
A1	0.000	0.100	0.000	0.004	
A2	0.900	1.050	0.035	0.041	
b	0.300	0.500	0.012	0.020	
С	0.080	0.150	0.003	0.006	
D	2.800	3.000	0.110	0.118	
E	1.200	1.400	0.047	0.055	
E1	2.250	2.550	0.089	0.100	
е	0.950	0.037 TYP		7 TYP	
e1	1.800	2.000	0.071	0.079	
Ĺ	0.550 REF		0.022 REF		
L1	0.300	0.500	0.012	0.020	
θ	0°	8°	0°	8°	

SOT-23 Suggested Pad Layout



- Note:
 1.Controlling dimension:in millimeters.
- 2.General tolerance:± 0.05mm.
 3.The pad layout is for reference purposes only.

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