

General Description

The QM6008K is the highest performance trench N-ch MOSFETs with extreme high cell density , which provide excellent RDSON and gate charge for most of the small power switching and load switch applications.

The QM6008K meet the RoHS and Green Product requirement with full function reliability approved.

Features

- Advanced high cell density Trench technology
- Super Low Gate Charge
- Excellent CdV/dt effect decline
- Green Device Available

Product Summery



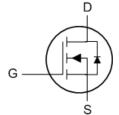
BVDSS	RDSON	ID
60V	100mΩ	2.3A

Applications

- High Frequency Point-of-Load Synchronous Buck Converter for MB/NB/UMPC/VGA
- Networking DC-DC Power System
- Load Switch

SOT23 Pin Configuration





Absolute Maximum Ratings

Symbol	Parameter	Rating	Units	
V_{DS}	Drain-Source Voltage	60	V	
V_{GS}	Gate-Source Voltage	±20	V	
I _D @T _A =25℃	Continuous Drain Current, V _{GS} @ 10V ¹	2.3	Α	
I _D @T _A =70°C	Continuous Drain Current, V _{GS} @ 10V ¹	1.8	Α	
I _{DM}	Pulsed Drain Current ²	9.2	Α	
P _D @T _A =25°C	Total Power Dissipation ³	1	W	
T _{STG}	Storage Temperature Range	-55 to 150	°C	
T _J	Operating Junction Temperature Range	-55 to 150	°C	

Thermal Data

Symbol	Parameter	Тур.	Max.	Unit
$R_{ heta JA}$	Thermal Resistance Junction-Ambient ¹		125	°C/W
$R_{ heta JC}$	Thermal Resistance Junction-Case ¹		80	°C/W



Electrical Characteristics (T_J=25 ℃, unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Тур.	Max.	Unit
BV _{DSS}	Drain-Source Breakdown Voltage	V_{GS} =0V , I_D =250uA	60			V
$\triangle BV_{DSS}/\triangle T_{J}$	BV _{DSS} Temperature Coefficient	Reference to 25℃ , I _D =1mA		0.054		V/℃
R _{DS(ON)}	Static Drain-Source On-Resistance ²	V _{GS} =10V , I _D =2A		80	100	mΩ
		V_{GS} =4.5V , I_D =1A		85	110	
$V_{GS(th)}$	Gate Threshold Voltage	V V I 050	1.2		2.5	V
$\triangle V_{GS(th)}$	V _{GS(th)} Temperature Coefficient	$V_{GS}=V_{DS}$, $I_D=250uA$		-4.96		mV/℃
	Drain Source Lookage Current	V _{DS} =48V , V _{GS} =0V , T _J =25℃			1	
I _{DSS}	Drain-Source Leakage Current	V_{DS} =48 V , V_{GS} =0 V , T_{J} =55 $^{\circ}$ C			5	uA
I _{GSS}	Gate-Source Leakage Current	V_{GS} = $\pm 20 V$, V_{DS} = $0 V$			±100	nA
gfs	Forward Transconductance	V_{DS} =5V , I_D =2A		13		S
Q_g	Total Gate Charge (4.5V)	V _{DS} =48V , V _{GS} =4.5V , I _D =2A		5	7.0	
Q_{gs}	Gate-Source Charge			1.68	2.4	nC
Q_{gd}	Gate-Drain Charge			1.9	2.7	
T _{d(on)}	Turn-On Delay Time	V_{DD} =30V , V_{GS} =10V , R_{G} =3.3 Ω , I_{D} =2A		1.6	3.2	
Tr	Rise Time			7.2	13	no
$T_{d(off)}$	Turn-Off Delay Time			25	50	ns
T _f	Fall Time			14.4	28.8	
C _{iss}	Input Capacitance	V _{DS} =15V , V _{GS} =0V , f=1MHz		511	715	
Coss	Output Capacitance			38	53	pF
C _{rss}	Reverse Transfer Capacitance			25	35	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Тур.	Max.	Unit
Is	Continuous Source Current ^{1,4}	V =V =0V Force Current			2.3	Α
I _{SM}	Pulsed Source Current ^{2,4}	V _G =V _D =0V , Force Current			9.2	Α
V_{SD}	Diode Forward Voltage ²	V _{GS} =0V , I _S =1A , T _J =25℃			1.2	V
t _{rr}	Reverse Recovery Time			9.7		nS
Q _{rr}	Reverse Recovery Charge	IF=2A , dI/dt=100A/ μ s , T $_{J}$ =25 $^{\circ}$ C		5.8		nC

Note

- 1. The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper.
- 2.The data tested by pulsed , pulse width $\,\leq\,300\text{us}$, duty cycle $\,\leq\,2\%$
- 4. The data is theoretically the same as I_D and I_{DM} , in real applications, should be limited by total power dissipation.



Typical Characteristics

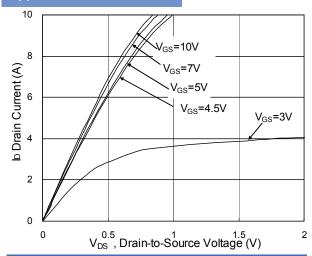


Fig.1 Typical Output Characteristics

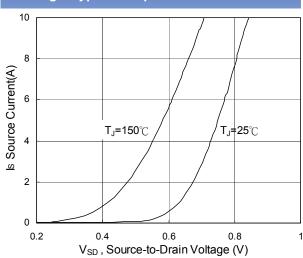


Fig.3 Forward Characteristics of Reverse

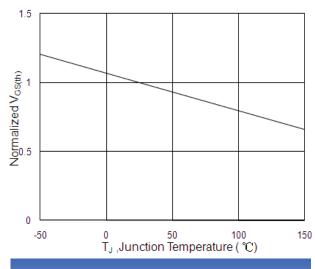


Fig.5 Normalized V_{GS(th)} v.s T_J

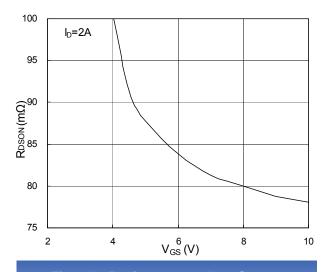


Fig.2 On-Resistance v.s Gate-Source

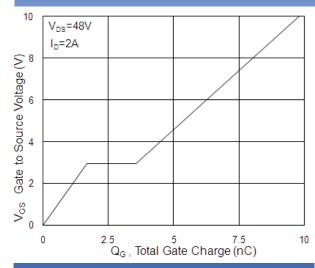


Fig.4 Gate-Charge Characteristics

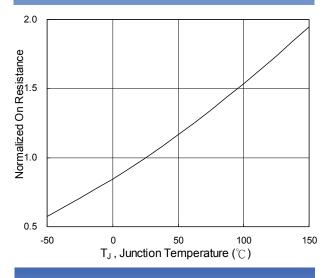
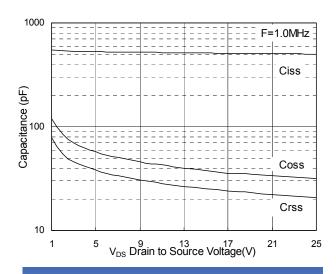


Fig.6 Normalized R_{DSON} v.s T_J





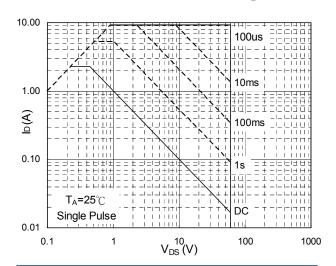


Fig.7 Capacitance

Fig.8 Safe Operating Area

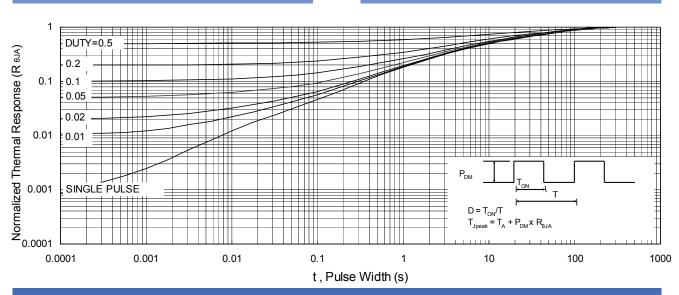
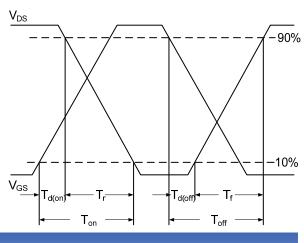


Fig.9 Normalized Maximum Transient Thermal Impedance



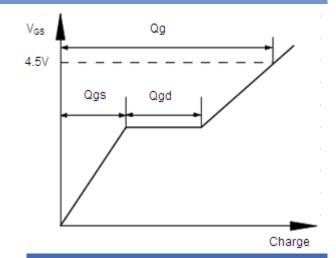


Fig.10 Switching Time Waveform

Fig.11 Gate Charge Waveform