P-Ch 30V Fast Switching MOSFETs

General Description

The QM3403K is the highest performance trench P-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 QM3403K meet the RoHS and Green Product requirement with full function reliability approved.

Product Summery

Green

BVDSS	RDSON	ID
-30V	95mΩ	-2.6A

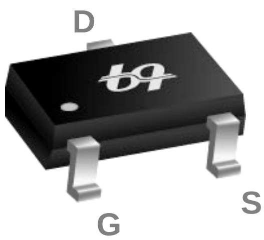
Applications

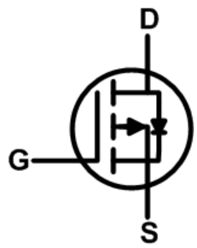
- High Frequency Point-of-Load Synchronous Small power switching for MB/NB/UMPC/VGA
- Networking DC-DC Power System
- Load Switch

Features

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

SOT 23 Pin Configuration





Absolute Maximum Ratings

Symbol	Parameter	Rating 10s	Rating Steady State	Units
V_{DS}	Drain-Source Voltage	-30		V
V_{GS}	Gate-Source Voltage	±12		V
I_D@T_A=25℃	Continuous Drain Current, V_{GS} @ -4.5V[1]	-3	-2.6	A
I_D@T_A=70℃	Continuous Drain Current, V_{GS} @ -4.5V[1]	-2.4	-2.1	A
I_{DM}	Pulsed Drain Current[2]	-11		A
P_D@T_A=25℃	Total Power Dissipation[3]	1.32	1	W
P_D@T_A=70℃	Total Power Dissipation[3]	0.84	0.64	W
T_{STG}	Storage Temperature Range	-55 to 150		℃
T_J	Operating Junction Temperature Range	-55 to 150		℃

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-Ambient [1]	---	125	℃/W
$R_{\theta JA}$	Thermal Resistance Junction-Ambient [1] (t ≤10s)	---	95	℃/W
$R_{\theta JC}$	Thermal Resistance Junction-Case[1]	---	80	℃/W

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

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V , I_D=-250uA	-30	---	---	V
$\triangle BV_{DSS}/\triangle T_J$	BV_{DSS} Temperature Coefficient	Reference to 25℃ , I_D=-1mA	---	-0.011	---	V/℃
$R_{DS(ON)}$	Static Drain-Source On-Resistance[2]	V_{GS}=-4.5V , I_D=-2A	---	80	95	mΩ
		V_{GS}=-2.5V , I_D=-1A	---	115	140	
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D =-250uA	-0.5	-0.7	-1.2	V
$\triangle V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient		---	3.95	---	mV/℃
I_{DSS}	Drain-Source Leakage Current	V_{DS}=-24V , V_{GS}=0V , T_J=25℃	---	---	-1	uA
		V_{DS}=-24V , V_{GS}=0V , T_J=55℃	---	---	-5	
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±12V , V_{DS}=0V	---	---	±100	nA
gfs	Forward Transconductance	V_{DS}=-5V , I_D=-2A	---	8.5	---	S
Q_g	Total Gate Charge (-4.5V)	V_{DS}=-15V , V_{GS}=-4.5V , I_D=-2A	---	8.1	11.3	nC
Q_{gs}	Gate-Source Charge		---	1.2	1.7	
Q_{gd}	Gate-Drain Charge		---	2.1	2.9	
$T_{d(on)}$	Turn-On Delay Time	V_{DD}=-15V , V_{GS}=-4.5V , R_G=3.3Ω, I_D=-2A	---	4	8.0	ns
T_r	Rise Time		---	33.2	60	
$T_{d(off)}$	Turn-Off Delay Time		---	26	52	
T_f	Fall Time		---	11.6	23.2	
C_{iss}	Input Capacitance	V_{DS}=-15V , V_{GS}=0V , f=1MHz	---	750	1050	pF
C_{oss}	Output Capacitance		---	79	111	
C_{rss}	Reverse Transfer Capacitance		---	57	80	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current[1,4]	V_G=V_D=0V , Force Current	---	---	-2.6	A
I_{SM}	Pulsed Source Current[2,4]		---	---	-11	A
V_{SD}	Diode Forward Voltage[2]	V_{GS}=0V , I_S=-1A , T_J=25℃	---	---	-1	V
t_{rr}	Reverse Recovery Time	I_F=-2A , dI/dt=100A/µs , T_J=25℃	---	14	---	nS
Q_{rr}	Reverse Recovery Charge		---	6.7	---	nC

Note :
1.The data tested by surface mounted on a 1 inch^2 FR-4 board with 2OZ copper.
2.The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%
3.The power dissipation is limited by 150℃ junction temperature
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

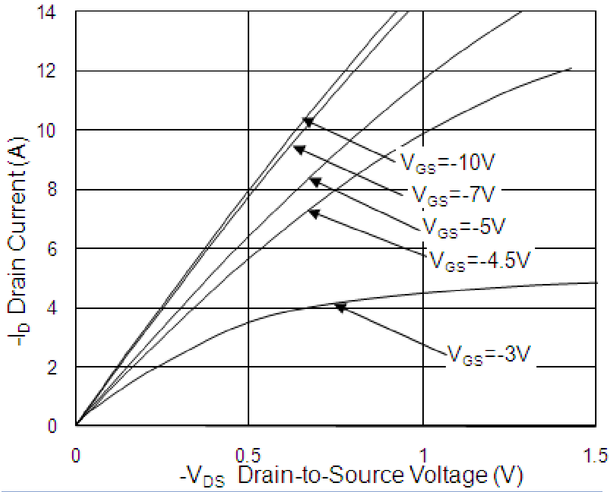


Fig.1 Typical Output Characteristics

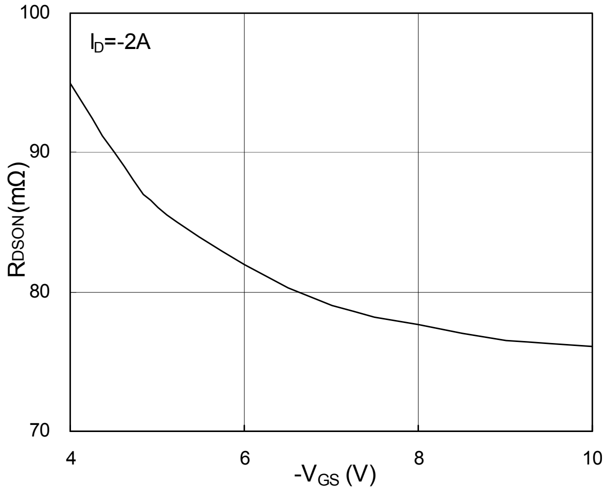


Fig.2 On-Resistance vs. G-S Voltage

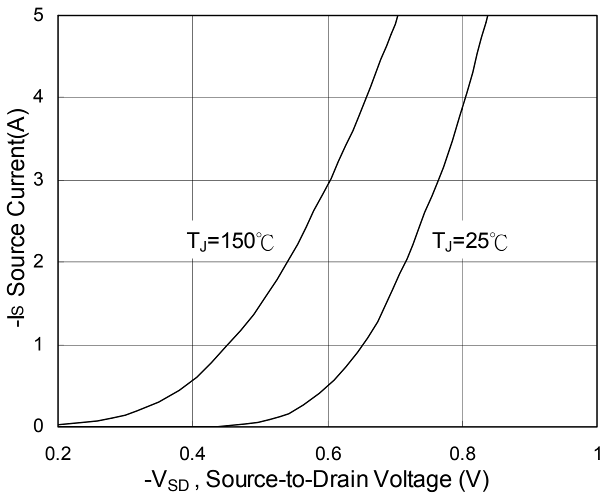


Fig.3 Forward Characteristics Of Reverse

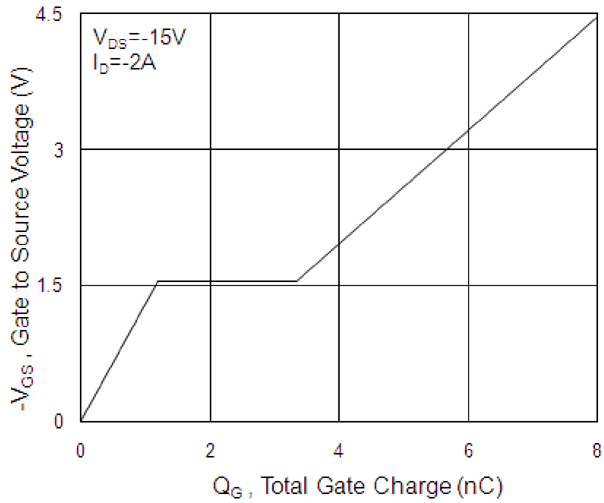


Fig.4 Gate-Charge Characteristics

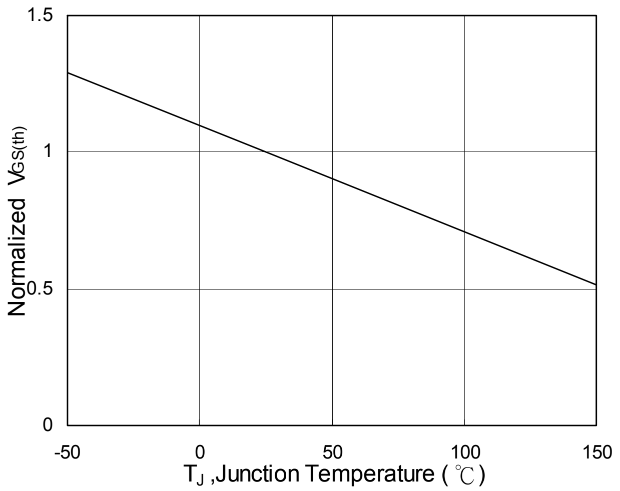


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

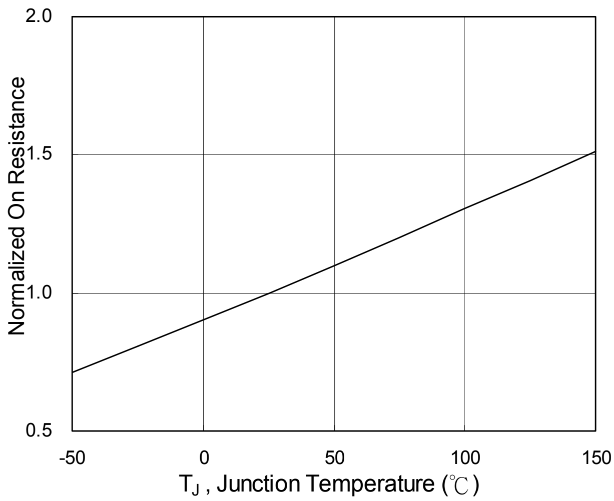


Fig.6 Normalized R_{DSON} vs. T_J

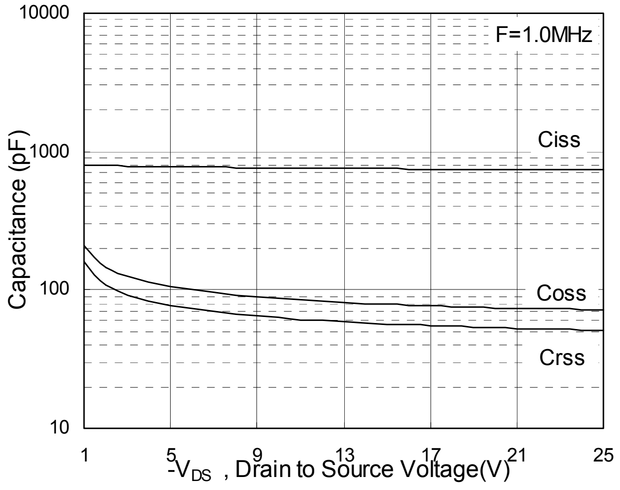


Fig.7 Capacitance

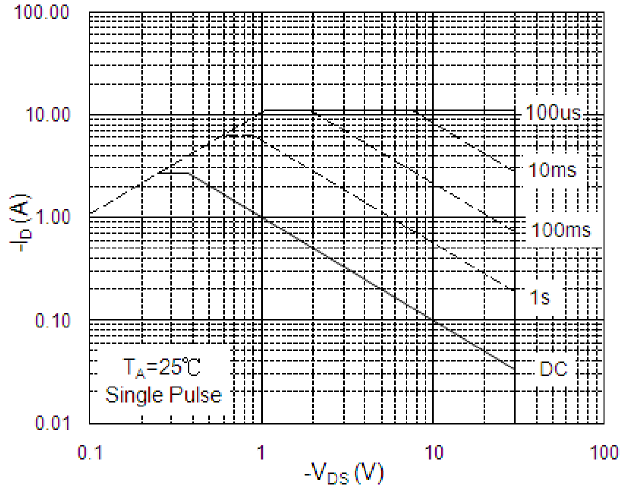


Fig.8 Safe Operating Area

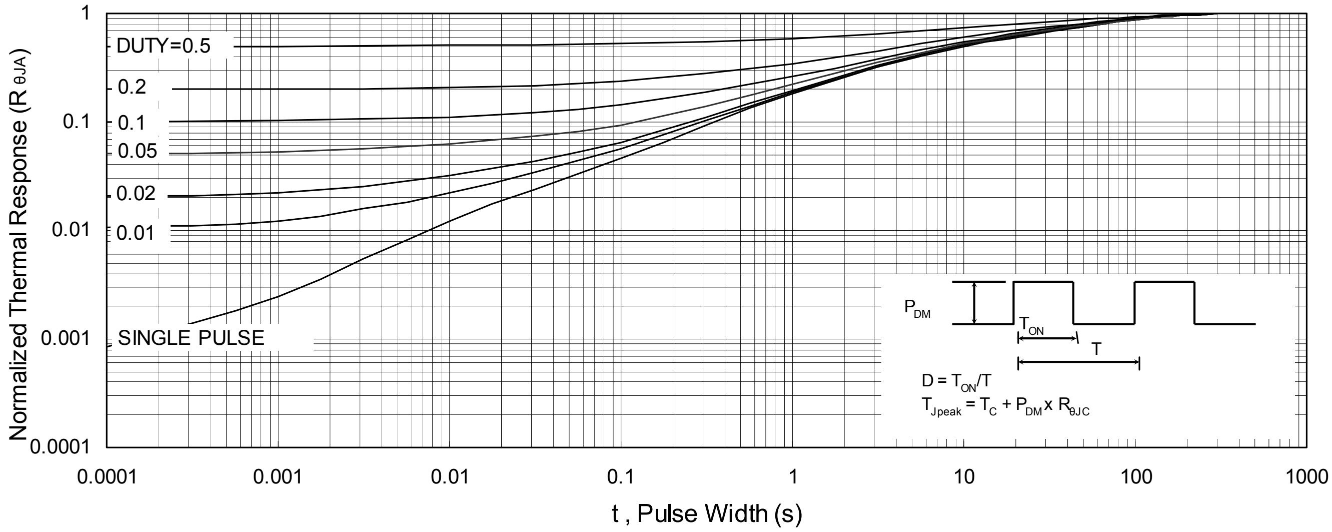


Fig.9 Normalized Maximum Transient Thermal Impedance

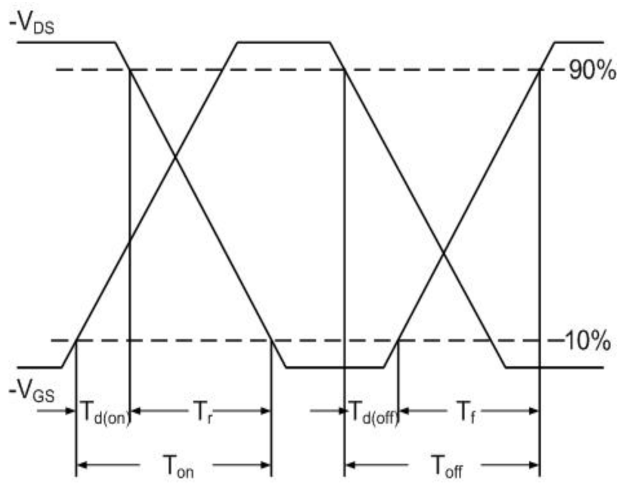


Fig.10 Switching Time Waveform

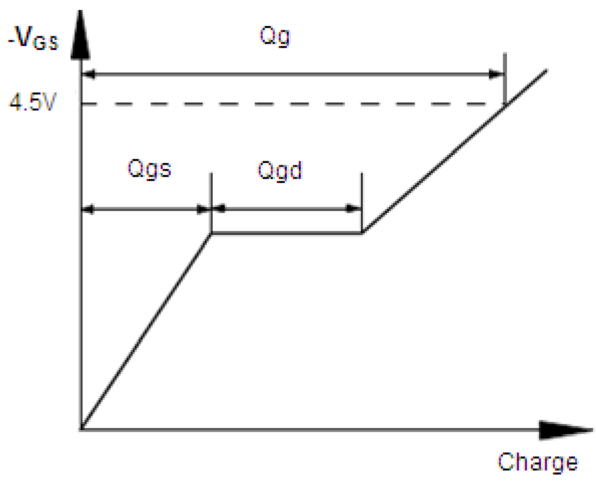


Fig.11 Gate Charge Waveform