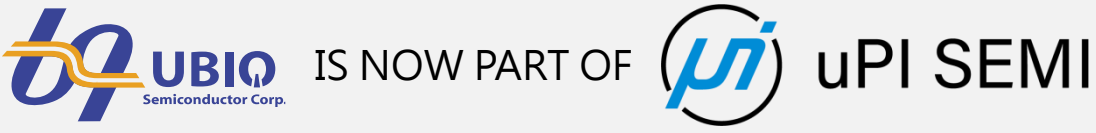

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QM3017AM3

P-Channel 30V Fast Switching MOSFET

General Description

The QM3017AM3 is a high performance trench P-channel MOSFET which utilizes extremely high cell density to provide low Rdson and gate charge characteristics. It is ideally suited to support most of Load switching and Motor applications .

The QM3017AM3 meets RoHS and Green Product requirements while supporting full function reliability.

Features

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

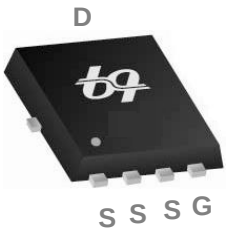
Product Summary

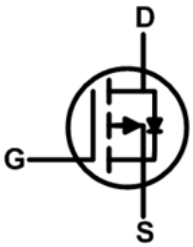
V_{DS}	$R_{DS(ON)}$ max (V_{GS}=-10V)	I_D (T_C=25 °C)
-30V	7.9mΩ	-56A

Applications

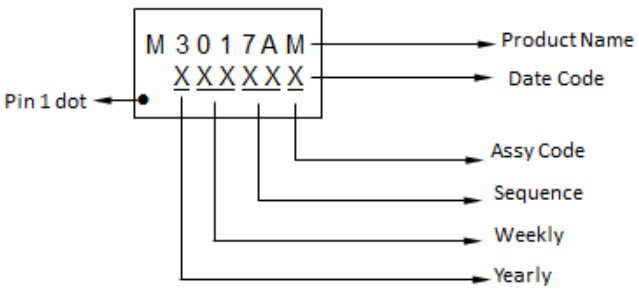
- ✓ Networking DC-DC Power System
- ✓ Load Switch

Pin Configuration





Ordering Information

Order Number	Package Type	Top Marking
QM3017AM3	PRPAK3X3	

QM3017AM3

Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	-30	V
V_{GS}	Gate-Source Voltage	±25	V
I_D@T_C=25°C	Continuous Drain Current, V_{GS} @ -10V[1]	-56	A
I_D@T_C=100°C	Continuous Drain Current, V_{GS} @ -10V[1]	-36	A
I_D@T_A=25°C	Continuous Drain Current, V_{GS} @ -10V[1]	-11.1	A
I_D@T_A=70°C	Continuous Drain Current, V_{GS} @ -10V[1]	-8.9	A
I_{DM}	Pulsed Drain Current[2]	-112	A
EAS	Single Pulse Avalanche Energy[3]	172.9	mJ
I_{AS}	Avalanche Current	-58.8	A
P_D@T_C=25°C	Total Power Dissipation[4]	43.4	W
P_D@T_A=25°C	Total Power Dissipation[4]	1.67	W
T_{STG}	Storage Temperature Range	-55 to 150	°C
T_J	Operating Junction Temperature Range	-55 to 150	°C

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-Ambient[1]	--	75	°C/W
$R_{\theta JC}$	Thermal Resistance Junction-Case[1]	--	2.88	°C/W

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P-Channel Electrical Characteristics

P-Channel 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
$\triangle BV_{DSS}/\triangle T_J$	BVDSS Temperature Coefficient	Reference to 25°C , I_D=-1mA	--	-0.018	--	V/°C
$R_{DS(ON)}$	Static Drain-Source On-Resistance[2]	V_{GS}=-10V , I_D=-15A	--	6.3	7.9	mΩ
		V_{GS}=-4.5V , I_D=-10A	--	10	13	
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D =-250uA	-1.2	-1.4	-2.5	V
$\triangle V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient		--	5.04	--	mV/°C
I_{DSS}	Drain-Source Leakage Current	V_{DS}=-24V , V_{GS}=0V , T_J=25°C	--	--	-1	uA
		V_{DS}=-24V , V_{GS}=0V , T_J=55°C	--	--	-5	
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±25V , V_{DS}=0V	--	--	±100	nA
gfs	Forward Transconductance	V_{DS}=-5V , I_D=-10A	--	25	--	S
Q_g	Total Gate Charge	V_{DS}=-15V , V_{GS}=-4.5V , I_D=-10A	--	30	--	nC
Q_{gs}	Gate-Source Charge		--	10	--	
Q_{gd}	Gate-Drain Charge		--	10.4	--	
$t_{d(on)}$	Turn-On Delay Time	V_{DS}=-15V , V_{GS}=-10V , R_G=3.3Ω, I_D=-10A	--	9.4	--	ns
t_r	Rise Time		--	10.2	--	
$t_{d(off)}$	Turn-Off Delay Time		--	117	--	
t_f	Fall Time		--	24	--	
C_{iss}	Input Capacitance	V_{DS}=-15V , V_{GS}=0V , f=1MHz	--	3448	--	pF
C_{oss}	Output Capacitance		--	508	--	
C_{rss}	Reverse Transfer Capacitance		--	421	--	

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Guaranteed Avalanche Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
EAS	Single Pulse Avalanche Energy[5]	V_{DD}=-25V , L=0.1mH , I_{AS}=-42A	88.2	--	--	mJ

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current [1,6]	V_G=V_D=0V , Force Current	--	--	-56	A
I_{SM}	Pulsed Source Current[2,6]		--	--	-112	A
V_{SD}	Diode Forward Voltage[2]	V_{GS}=0V , I_S=-1A , T_J=25°C	--	--	-1.2	V
t_{rr}	Reverse Recovery Time	I_F=-10A , di/dt=100A/μs , T_J=25°C	--	19.4	--	nS
Q_{rr}	Reverse Recovery Charge		--	9.1	--	nC

Note:

1. Test data conducted with surface mount attachment to 1 inch^2, FR-4 board utilizing 2oz copper
2. Pulse Test. Pulse width ≦300uS, duty cycle ≦ 2%
3. EAS data is a maximum rating. The test condition is V_{DD}=-25V,V_{GS}=-10V,L=0.1mH
4. The power dissipation is limited by a 150°C maximum junction temperature
5. The Min. value is 100% EAS tested guarantee
6. The data is theoretically the same as I_D and I_{DM}. In real applications, it will be limited by total power

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Typical Characteristics

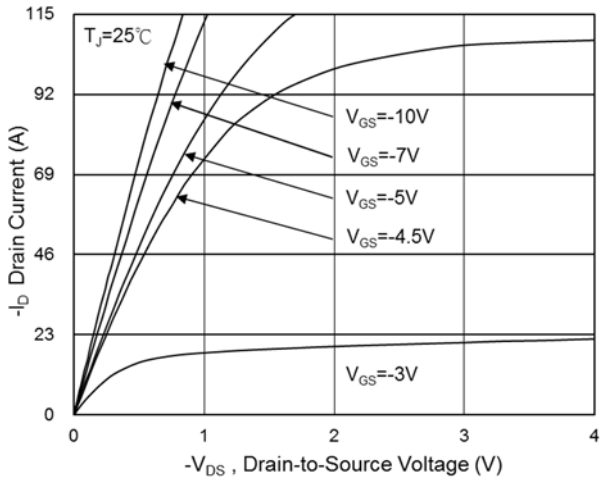

Fig.1: Typical Output Characteristics

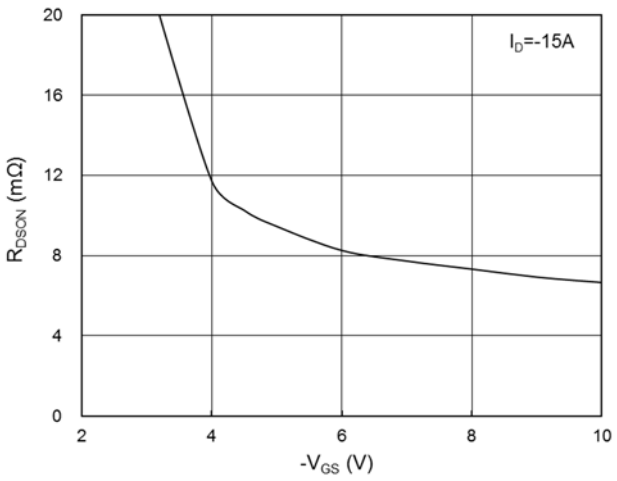

Fig.2: On-Resistance vs. Gate-Source

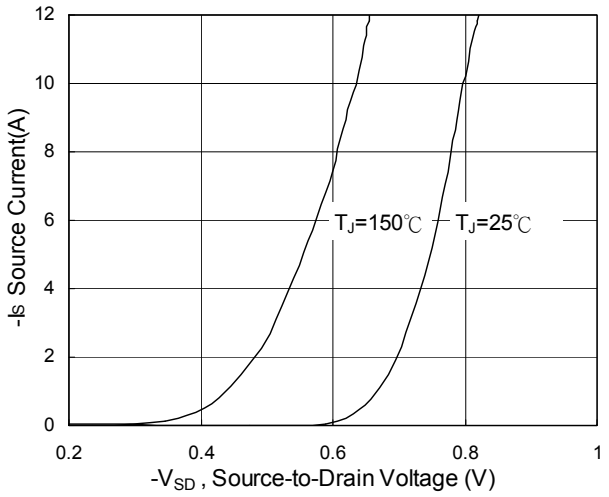

Fig.3: Forward Characteristics of Reverse

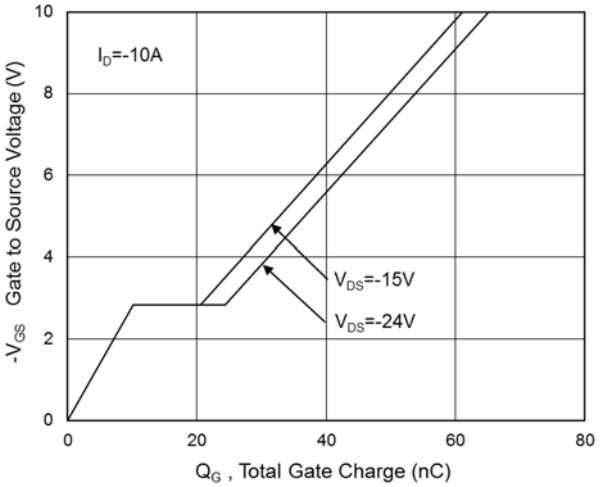

Fig.4: Gate-Charge Characteristics

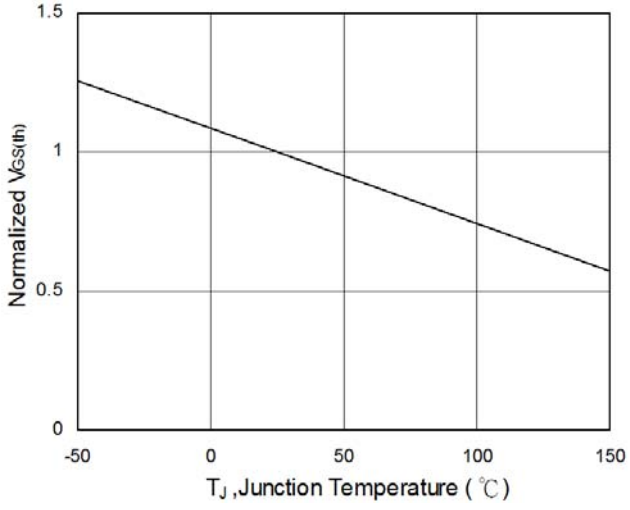

Fig.5: Normalized $V_{GS(th)}$ vs. T_J

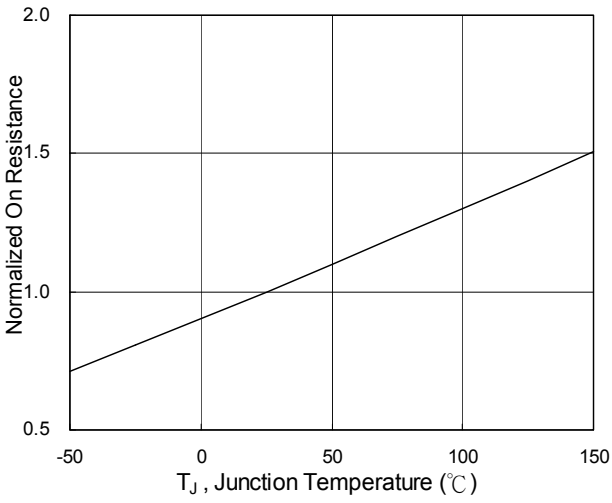

Fig.6: Normalized R_{DSON} vs. T_J

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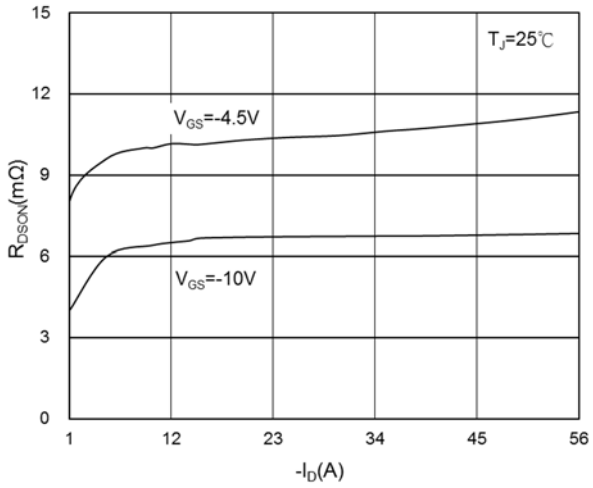

Fig.7: Drain-Source On-State Resistance

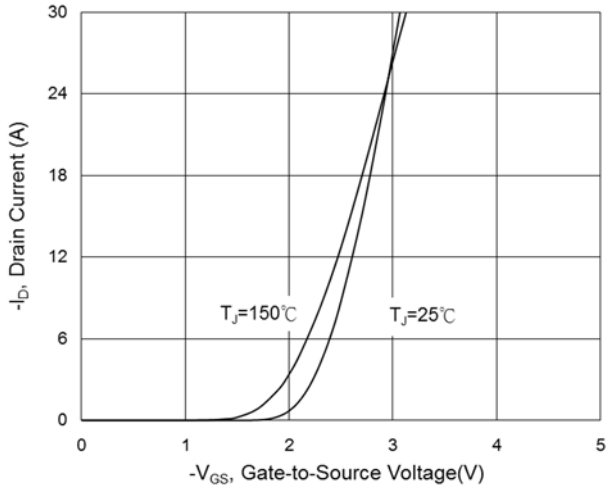

Fig.8: Transfer Characteristics

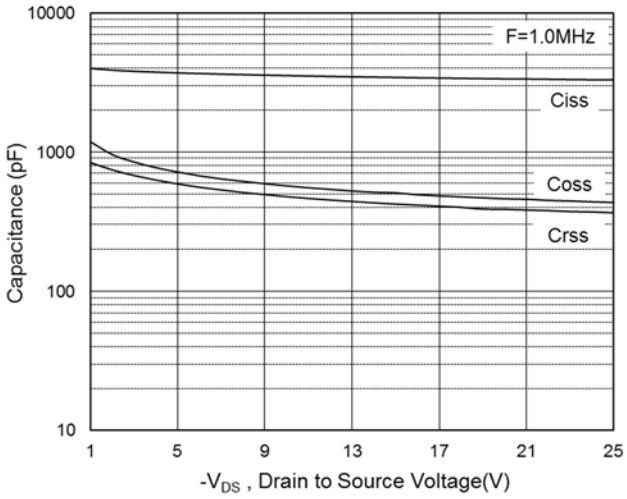

Fig.9: Capacitance

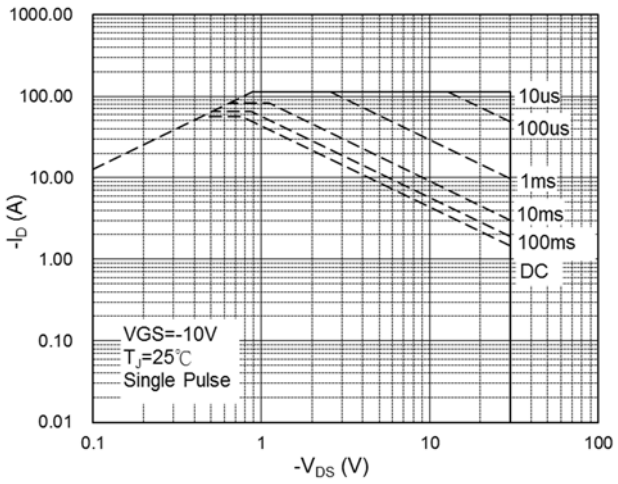

Fig.10: Safe Operating Area

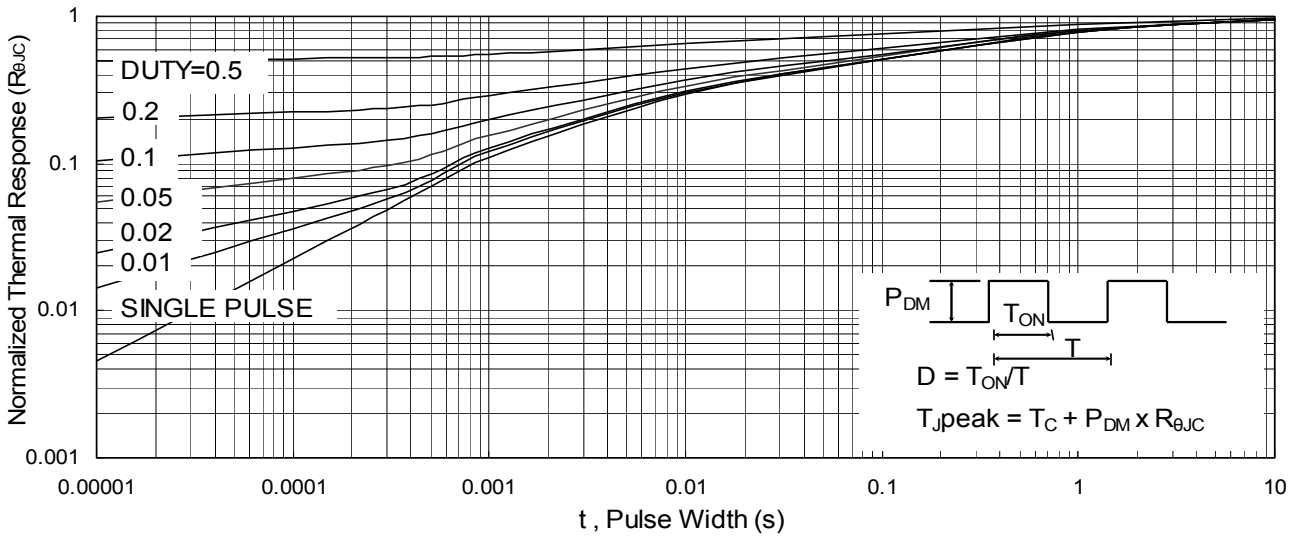

Fig.11: Normalized Maximum Transient Thermal Impedance

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