UMW FDC604P

-20V P-Channel MOSFET

1.Description

The FDC604P is the high cell density trenched P-channel MOSFETs, which provide excellent $R_{DS(ON)}$ and gate charge for most of the synchronous buck converter applications.

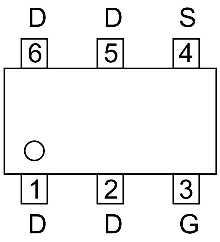
2.Features

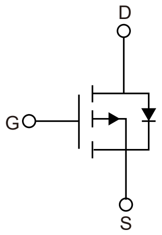
- $V_{DS\ (V)}$=-20V
- I_D=-6A(V_{GS}=10V)
- $R_{DS(ON)}$<35mΩ(V_{GS}=10V)
- $R_{DS(ON)}$<53mΩ(V_{GS}=4.5V)

3.Pinning information

Pin	Symbol	Description
1,2,5,6	D	DRAIN
3	G	GATE
4	S	SOURCE

SOP-8





4.Absolute Maximum Ratings T_A=25°C unless otherwise noted

Parameter		Symbol	Rating	Units
Drain Source Voltage		V_{DS}	-20	V
Gate Source Voltage		V_{GS}	±12	V
Continuous Drain Current, V_{GS}=-4.5V [1]	T_A=25°C	I_D	-6	A
	T_A=70°C		-3	A
Pulsed Drain Current [2]		I_{DM}	-16	A
Total Power Dissipation [3]	T_A=25°C	P_D	1.31	W
Total Power Dissipation [3]	T_A=70°C		0.84	W
Storage Temperature Range		T_{STG}	-55 to 150	°C
Operating Junction Temperature Range		T_J	-40 to 105	°C

5.Electrical Characteristics (T_J=25°C unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS}=0V, I_{DS}=-250μA	-20			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=-20V, V_{GS}=0V			1	μA
Gate-Body Leakage	I_{GSS}	V_{GS}=±12V, V_{DS}=0V			±100	nA
ON CHARACTERISTIC						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_{DS}=-250μA	-0.4	-0.7	-1	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=-4.5V, I_D=-4.1A		28	35	mΩ
		V_{GS}=-2.5V, I_D=-3A		38	53	mΩ
DYNAMIC CHARACTERISTICS						
Input Capacitance	C_{iss}	V_{DS}=-10V, V_{GS}=0V, f=1MHz		830		pF
Output Capacitance	C_{oss}			132		pF
Reverse Transfer Capacitance	C_{rss}			85		pF
Total Gate Charge	Q_g	V_{DS}=-10V, I_D=-2A, V_{GS}=-4.5V		8.8		nC
Gate-Source Charge	Q_{gs}			1.4		nC
Gate-Drain(“Miller”) Charge	Q_{gd}			1.9		nC
SWITCHING CHARACTERISTICS						
Turn-On Delay Time	$t_{D(on)}$	V_{DD}=-10V, I_D=-3.3A R_G=1Ω, V_{GEN}=-4.5A		10		ns
Rise Time	t_r			32		ns
Turn-Off Delay Time	$t_{D(off)}$			50		ns
Fall Time	t_f			51		ns
Maximum Continuous Drain to Source Diode ForwardCurrent	I_S				-5	A
Maximum Pulsed Drain to Source Diode Forward Current	I_{SM}				-16	A
Drain to Source Diode Forward Voltage	V_{SD}	V_{GS}=0V, I_S=-4.1A			-1.2	V

Notes: 1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature.

2. Pulse Test: Pulse Width≤300μs, Duty Cycle ≤ 2%.

6.1Typical Characterisitics

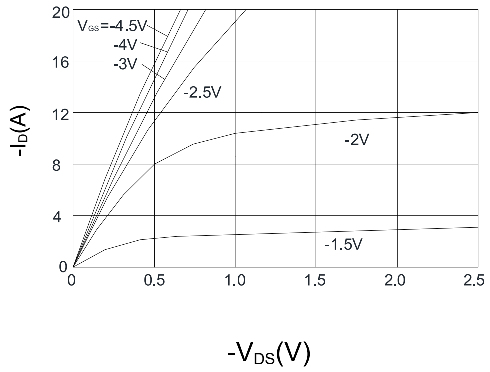


Figure 1: Output Characteristics

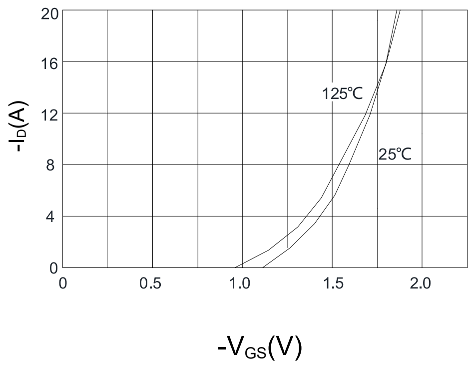


Figure 2: Typical Transfer Characteristics

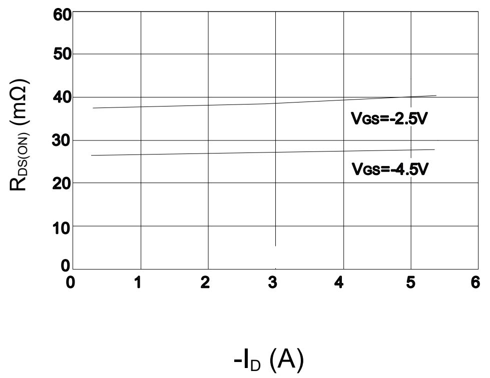


Figure 3: On-resistance vs. Drain Current

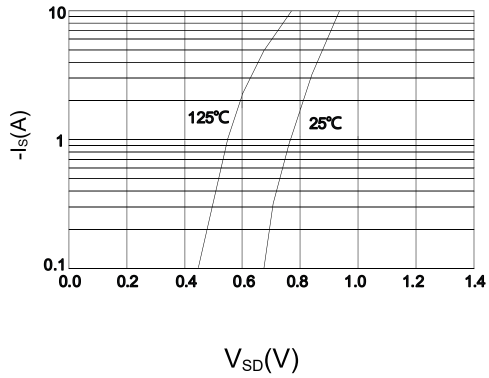


Figure 4: Body Diode Characteristics

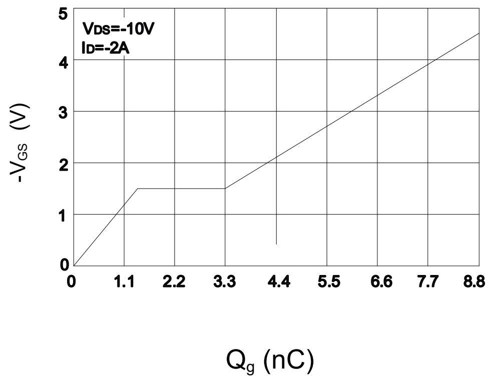


Figure 5: Gate Charge Characteristics

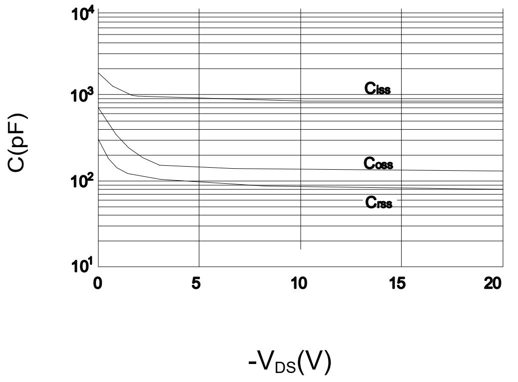


Figure 6: Capacitance Characteristics

6.2Typical Characterisitics

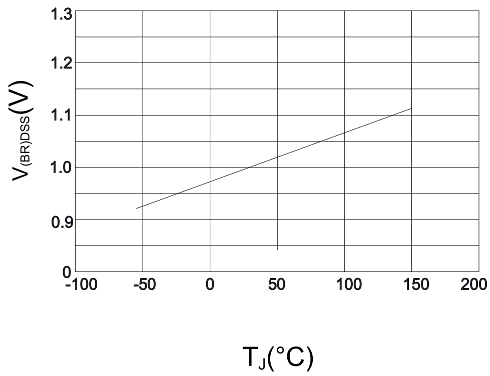


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

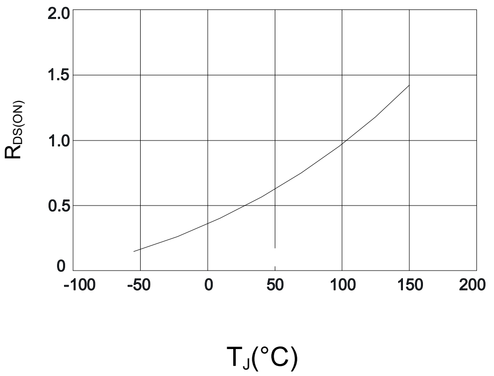


Figure 8: Normalized on Resistance vs. Junction Temperature

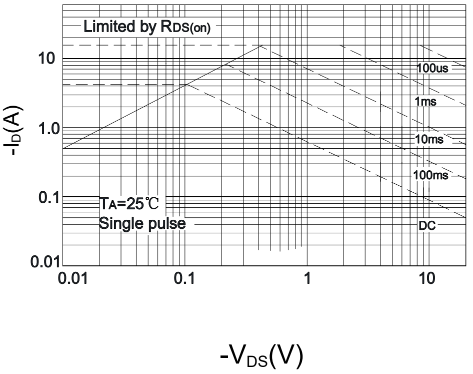


Figure 9: Maximum Safe Operating Area

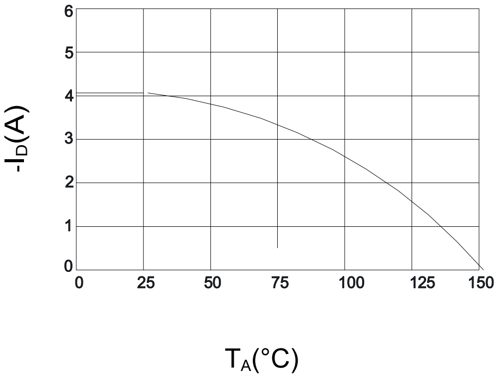


Figure 10: Maximum Continuous Drain Current vs. Ambient Temperature

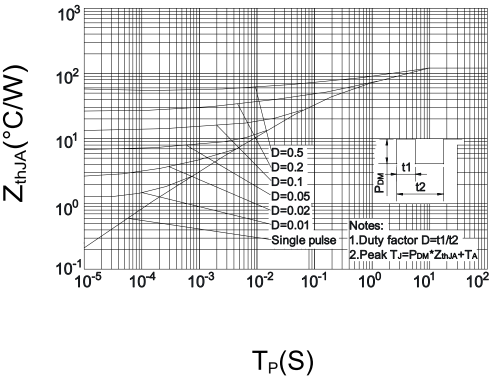
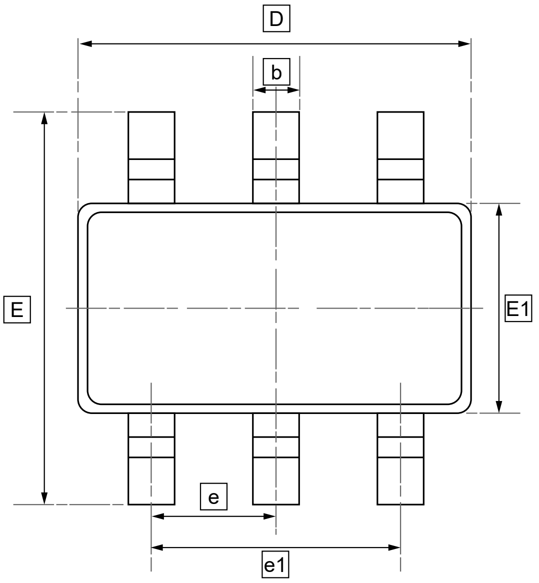
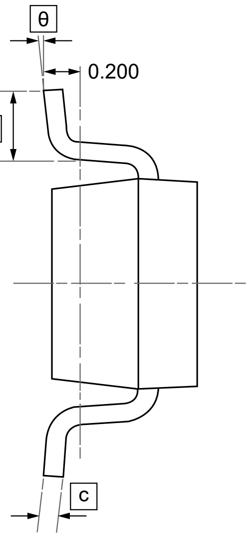
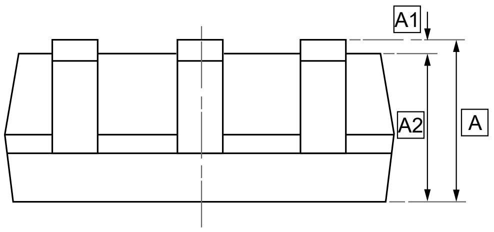


Figure 11: Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

7.SOT23-6 Package Outline Dimensions



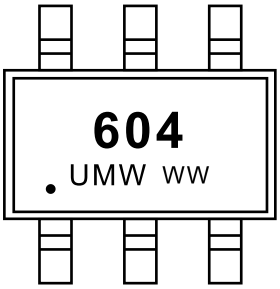




DIMENSIONS (mm are the original dimensions)

Symbol	A	A1	A2	b	c	D	E1	E	e	e1	L	θ
Min	1.050	0.000	1.050	0.300	0.100	2.820	1.500	2.650	0.950	1.800	0.300	0°
Max	1.250	0.100	1.150	0.500	0.200	3.020	1.700	2.950	BSC	2.000	0.600	8°

8.Ordering information



ww: Week Code

Order Code	Package	Base QTY	Delivery Mode
UMW FDC604P	SOT23-6	3000	Tape and reel

10.Disclaimer

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