

1.Features

- $V_{DS(V)}=30V$
- $I_D=6.9A(V_{GS}=10V)$
- $R_{DS(ON)}=28m\Omega(V_{GS}=10V)$
- $R_{DS(ON)}=33m\Omega(V_{GS}=4.5V)$

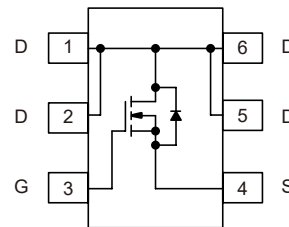
2.Applications

- Low On-Resistance
- DC/DC Converters, High Speed Switching

3.Pinning information

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

SOT23-6



4.Absolute Maximum Ratings $T_A=25^{\circ}C$

Parameter		Symbol	Maximum	Units
Drain-Source Voltage		V_{DS}	30	V
Gate-Source Voltage		V_{GS}	± 12	V
Continuous Drain Current	$T_A=25^{\circ}C$	I_D	6.9	A
	$T_A=70^{\circ}C$		5.8	
Pulsed Drain Current ^C		I_{DM}	35	
Power Dissipation ^B	$T_A=25^{\circ}C$	P_D	2	W
	$T_A=70^{\circ}C$		1.3	W
Junction and Storage Temperature Range		T_J, T_{STG}	-55 to 150	$^{\circ}C$

5.Thermal Characteristics

Parameter		Symbol	Typ	Max	Units
Maximum Junction-to-Ambient ^A	$t \leq 10s$	$R_{\theta JA}$	47.5	62.5	$^{\circ}C/W$
Maximum Junction-to-Ambient ^{AD}	Steady-State		74	110	$^{\circ}C/W$
Maximum Junction-to-Lead	Steady-State	$R_{\theta JL}$	37	50	$^{\circ}C/W$



6. Electrical Characteristic ($T_J=25^{\circ}\text{C}$ unless otherwise noted)

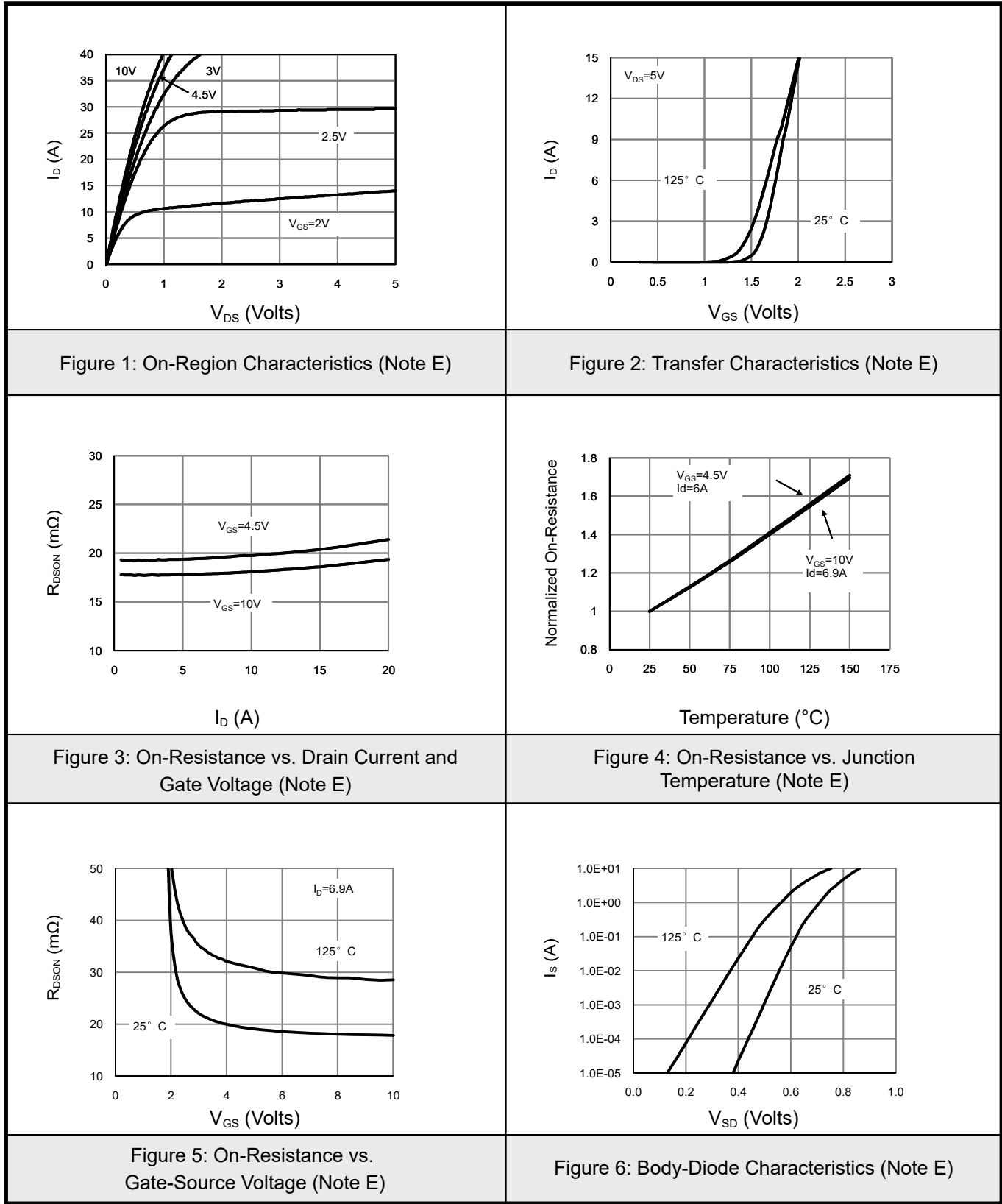
Parameter	Symbol	Conditions	Min	Typ	Max	Units
STATIC PARAMETERS						
Drain-Source Breakdown Voltage	BV_{DSS}	$I_D=250\mu\text{A}$, $V_{GS}=0\text{V}$	30			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=30\text{V}$, $V_{GS}=0\text{V}$			1	μA
		$T_J=55^{\circ}\text{C}$			5	
Gate-Body leakage current	I_{GSS}	$V_{DS}=0\text{V}$, $V_{GS}=\pm 12\text{V}$			100	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}$, $I_D=250\mu\text{A}$	0.65	1.05	1.45	V
On state drain current	$I_{D(ON)}$	$V_{GS}=4.5\text{V}$, $V_{DS}=5\text{V}$	35			A
Static Drain-Source On-Resistance	$R_{DS(ON)}$	$V_{GS}=10\text{V}$, $I_D=6.9\text{A}$		18	28	$\text{m}\Omega$
		$V_{GS}=4.5\text{V}$, $I_D=6\text{A}$		19	33	$\text{m}\Omega$
		$V_{DS}=2.5\text{V}$, $I_D=5\text{A}$		24	52	$\text{m}\Omega$
Forward Transconductance	g_{FS}	$V_{DS}=5\text{V}$, $I_D=6.9\text{A}$		33		S
Diode Forward Voltage	V_{SD}	$I_S=1\text{A}$, $V_{GS}=0\text{V}$		0.7	1	V
Maximum Body-Diode Continuous Current	I_S				2	A
DYNAMIC PARAMETERS						
Input Capacitance	C_{iss}	$V_{GS}=0\text{V}$, $V_{DS}=15\text{V}$, $f=1\text{MHz}$		630		pF
Output Capacitance	C_{oss}			75		pF
Reverse Transfer Capacitance	C_{rss}			50		pF
Gate resistance	R_g	$V_{GS}=0\text{V}$, $V_{DS}=0\text{V}$, $f=1\text{MHz}$	1.5	3	4.5	Ω
SWITCHING PARAMETERS						
Total Gate Charge	Q_g	$V_{GS}=4.5\text{V}$, $V_{DS}=15\text{V}$ $I_D=6.9\text{A}$		6	7	nC
Gate Source Charge	Q_{gs}			1.3		nC
Gate Drain Charge	Q_{gd}			1.8		nC
Turn-On DelayTime	$t_{D(on)}$	$V_{GS}=10\text{V}$, $V_{DS}=15\text{V}$ $R_L=2.2\Omega$, $R_{GEN}=3\Omega$		3		ns
Turn-On Rise Time	t_r			2.5		ns
Turn-Off DelayTime	$t_{D(off)}$			25		ns
Turn-Off Fall Time	t_f			4		ns
Body Diode Reverse Recovery Time	t_{rr}	$I_F=6.9\text{A}$, $dI/dt=100\text{A}/\mu\text{s}$		8.5		ns
Body Diode Reverse Recovery Charge	Q_{rr}	$I_F=6.9\text{A}$, $dI/dt=100\text{A}/\mu\text{s}$		2.6		nC



- A. The value of $R_{\theta JA}$ is measured with the device mounted on 1in² FR-4 board with 2oz. Copper, in a still air environment with $T_A=25^{\circ}\text{C}$. The value in any given application depends on the user's specific board design.
- B. The power dissipation P_D is based on $T_{J(MAX)}=150^{\circ}\text{C}$, using $\leq 10\text{s}$ junction-to-ambient thermal resistance.
- C. Repetitive rating, pulse width limited by junction temperature $T_{J(MAX)}=150^{\circ}\text{C}$. Ratings are based on low frequency and duty cycles to keep initial $T_J=25^{\circ}\text{C}$.
- D. The $R_{\theta JA}$ is the sum of the thermal impedance from junction to lead $R_{\theta JL}$ and lead to ambient.
- E. The static characteristics in Figures 1 to 6 are obtained using $<300\mu\text{s}$ pulses, duty cycle 0.5% max.
- F. These curves are based on the junction-to-ambient thermal impedance which is measured with the device mounted on 1in² FR-4 board with 2oz. Copper, assuming a maximum junction temperature of $T_{J(MAX)}=150^{\circ}\text{C}$. The SOA curve provides a single pulse rating.



7.1Typical characteristic





7.2 Typical characteristic

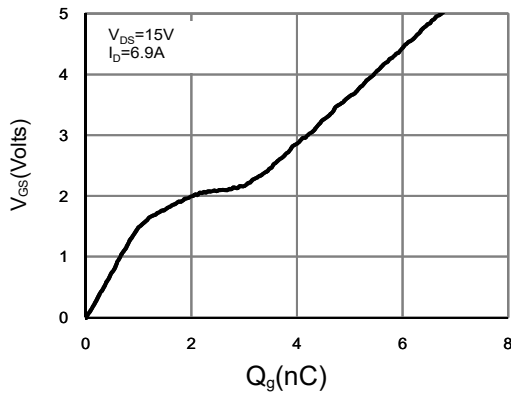


Figure 7: Gate-Charge Characteristics

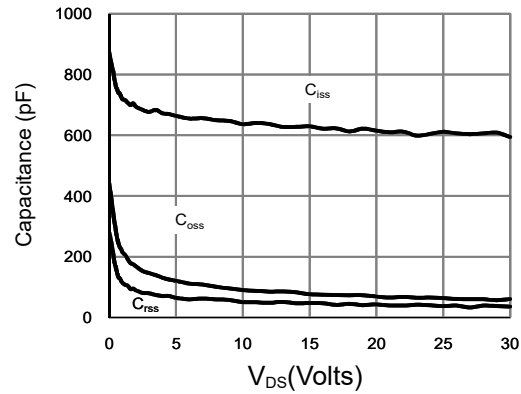


Figure 8: Capacitance Characteristics

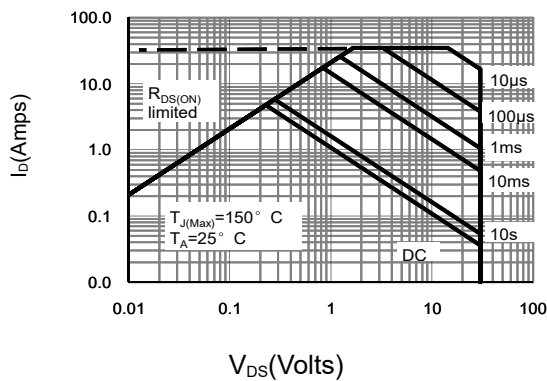


Figure 9: Maximum Forward Biased Safe Operating Area (Note F)

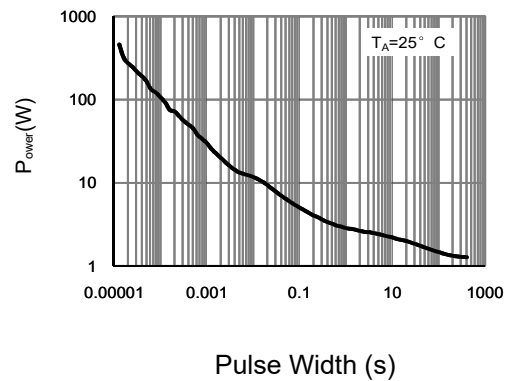


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note F)

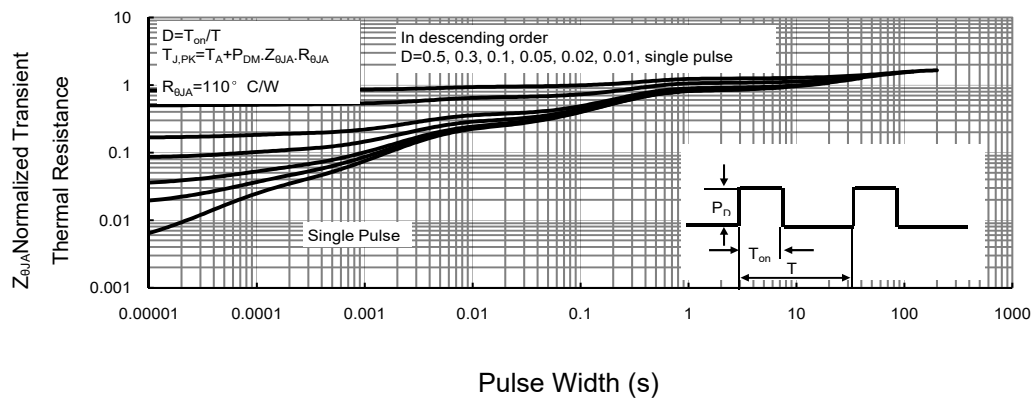
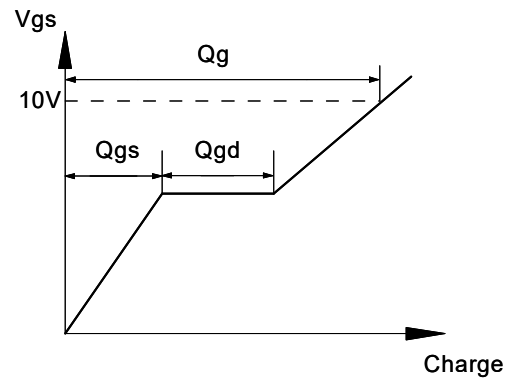
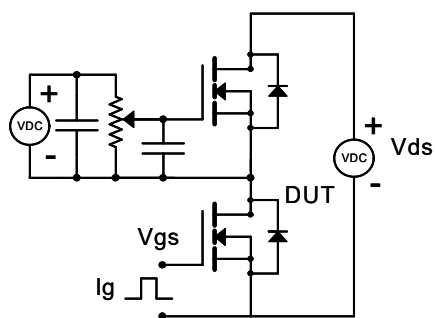


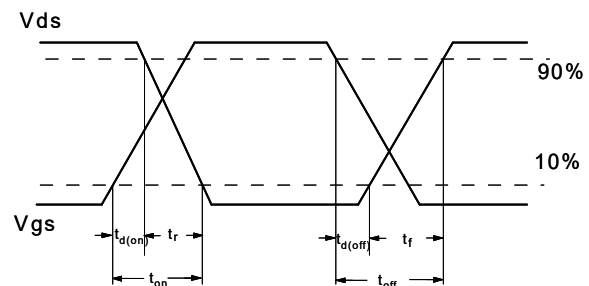
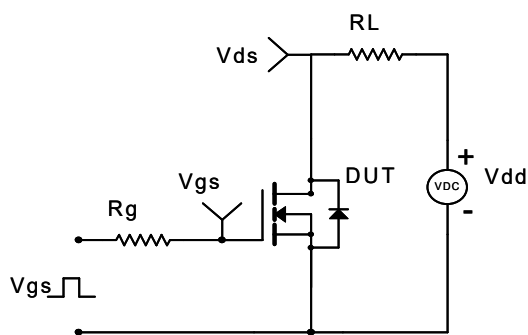
Figure 11: Normalized Maximum Transient Thermal Impedance (Note F)



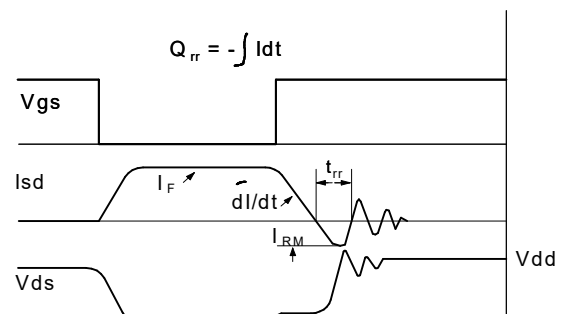
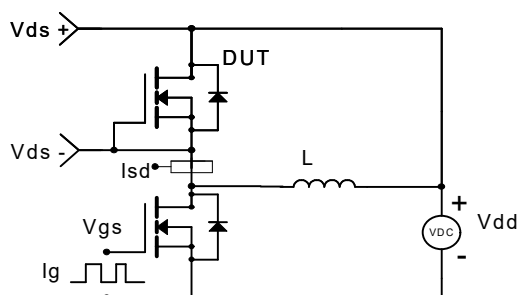
7.3 Typical characteristic



Gate Charge Test Circuit & Waveform



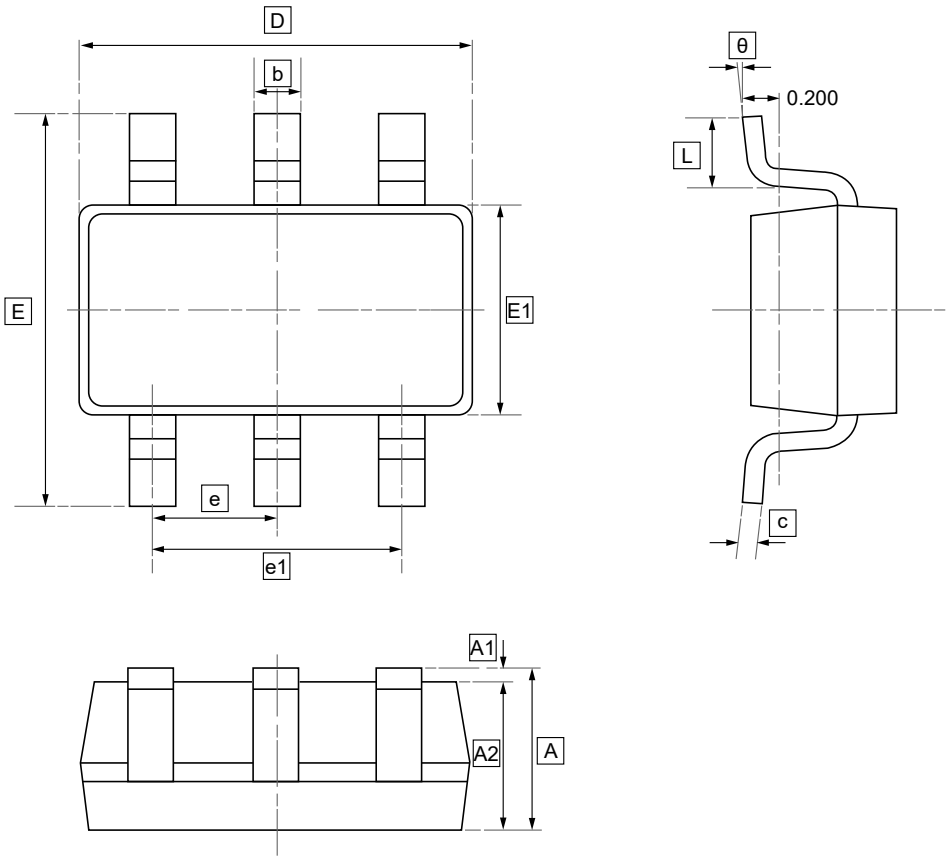
Resistive Switching Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



8.SOT23-6 Package Outline Dimensions

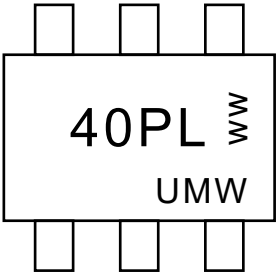


DIMENSIONS (mm are the original dimensions)

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°



9.Ordering information



ww: Week Code

Order Code	Package	Base QTY	Delivery Mode
UMW AO6400	SOT23-6	3000	Tape and reel



10.Disclaimer

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