UMW SUD50P06-15

-40V P-Channel MOSFET

1.Features

- $V_{DS\ (V)}$=-60V
- $R_{DS(ON)}$<15mΩ(V_{GS}=-10V)
- $R_{DS(ON)}$<20mΩ(V_{GS}=-4.5V)

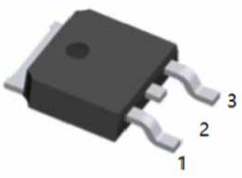
2.Applications

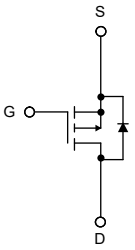
- Load Switch

3.Pinning information

Pin	Symbol	Description
1	G	GATE
2	D	DRAIN
3	S	SOURCE

TO-252(DPAK)
top view





4.Absolute Maximum Ratings T_A= 25°C

Parameter		Symbol	Value	Units
Drain-Source Voltage		V_{DS}	-60	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current (T_J=150°C)	T_C=25°C	I_D	-50[d]	A
	T_C=125°C		-27.5	
Pulsed Drain Current		I_{DM}	-80	
Avalanche Current		I_{AS}	-50	
Single Pulse Avalanche Energy [a]	L=0.1mH	E_{AS}	125	mJ
Power Dissipation	T_C=25°C	P_D	113[c]	W
	T_A=25°C		2.5[b,c]	W
Junction and Storage Temperature Range		T_J,T_{STG}	-55 to 150	°C

5.Thermal resist ance rating

Parameter		Symbol	Typ	Max	Units
Junction-to-Ambient [b]	t ≤10s	R_{thJA}	15	18	°C/W
	Steady-State		40	50	°C/W
Junction-to-Case		R_{thJC}	0.82	1.1	°C/W

Notes:

a. Duty cycle ≤ 1 %.

b. When mounted on 1" square PCB (FR-4 material).

c. See SOA curve for voltage derating.

d. Package limited.

6.Specifications (T_J= 25°C, unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Static						
Drain-Source Breakdown Voltage	V_{DS}	V_{GS}=0V, I_D=-250μA	-60			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=-250μA	-1.1	-1.8	-2.5	V
Gate-Body Leakage	I_{GSS}	V_{GS}=±20V, V_{DS}=0V			±100	nA
Zero gate voltage drain current	I_{DSS}	V_{DS}=-60V,V_{GS}=0V			-1	μA
		V_{DS}=-60V,V_{GS}=0V,T_J=125°C			-50	μA
		V_{DS}=-60V,V_{GS}=0V,T_J=150°C			-100	μA
On-State Drain Current [a]	$I_{D(ON)}$	V_{DS}=-5V, V_{GS}=-10V	-50			A
Drain-Source On-State Resistance [a]	$R_{DS(ON)}$	V_{GS}=-10V, I_D=-17A		12	15	mΩ
		V_{GS}=-10V, I_D=-50A,T_J=125°C			25	mΩ
		V_{GS}=-10V, I_D=-50A,T_J=150°C			28	mΩ
		V_{GS}=-4.5V, I_D=-14A			20	mΩ
Forward Transconductance [a]	g_{FS}	V_{DS}=-15V, I_D=-17A		61		S
Dynamic [b]						
Input Capacitance	C_{iss}	V_{GS}=0V, V_{DS}=-25V, f=1MHz		4950		pF
Output Capacitance	C_{oss}			480		pF
Reverse Transfer Capacitance	C_{rss}			405		pF
Total Gate Charge [c]	Q_g	V_{DS}=-30V, V_{GS}=-10V, I_D=-50A		110	165	nC
Gate-Source Charge [c]	Q_{gs}			19		nC
Gate-Drain Charge [c]	Q_{gd}			28		nC
Turn-On Delay Time [c]	$t_{D(on)}$	V_{DD}=-30V, R_L=0.6Ω I_D≅-50A, V_{GEN}=-10V, R_G=6Ω		15	23	nS
Rise Time [c]	t_r			70	105	nS
Turn-Off Delay Time [c]	$t_{D(off)}$			175	260	nS
Fall Time [c]	t_f			175	260	nS

Source-Drain Diode Ratings and Characteristics T_C=25 °C [b]						
Continuous Current	I_S				-50	A
Pulsed Current	I_{SM}				-80	A
Forward Voltage [a]	V_{SD}	I_F=-50A, V_{GS}=0V		-1	-1.6	V
Reverse Recovery Time	t_{rr}	I_F=-50A, dI/dt=100A/μs		45	70	ns

Notes:

a. Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2 %.

b. Guaranteed by design, not subject to production testing.

c. Independent of operating temperature.

7.1Typical Characterisitics

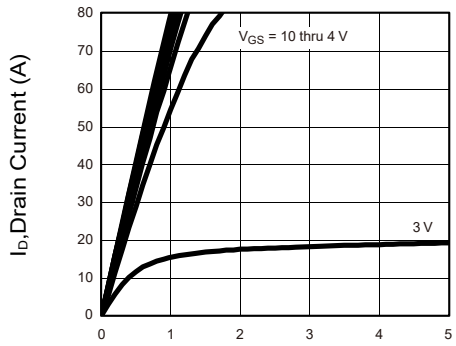


Figure 1: Output Characteristics

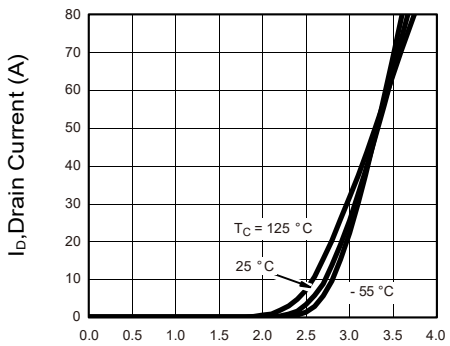


Figure 2: Transfer Characteristics

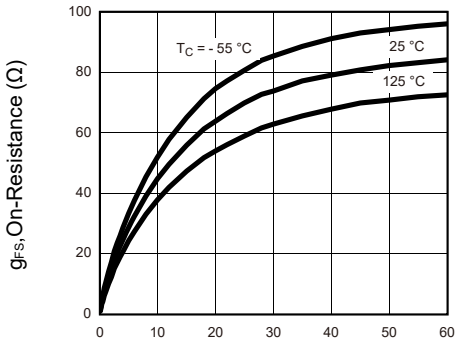


Figure 3: Transconductance

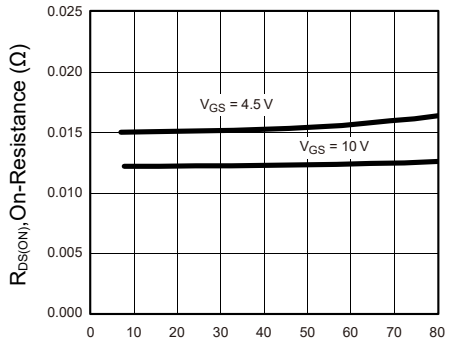


Figure 4: On-Resistance vs. Drain Current

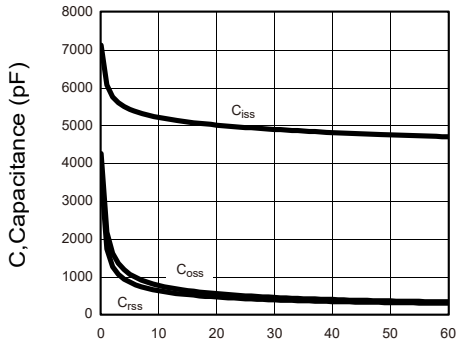


Figure 5: Transconductance

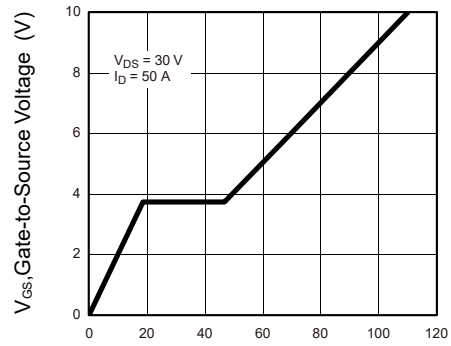


Figure 6: On-Resistance vs. Drain Current

7.2Typical Characterisitics

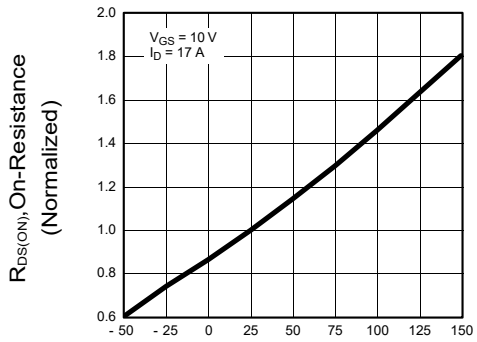


Figure 7: On-Resistance vs. Junction Temperature

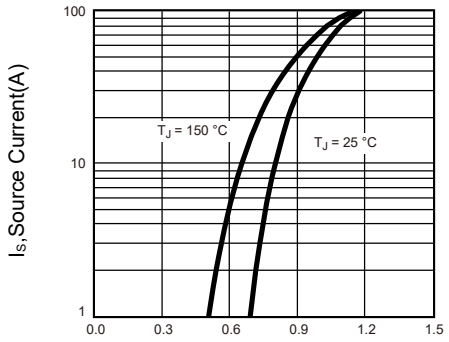


Figure 8: Source-Drain Diode Forward Voltage

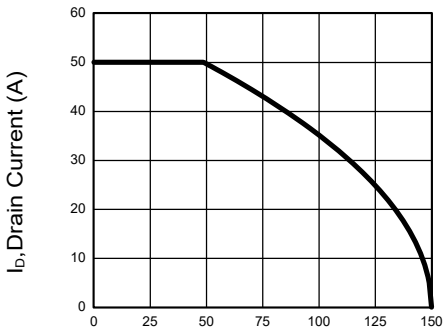


Figure 9: Drain Current vs. Case Temperature

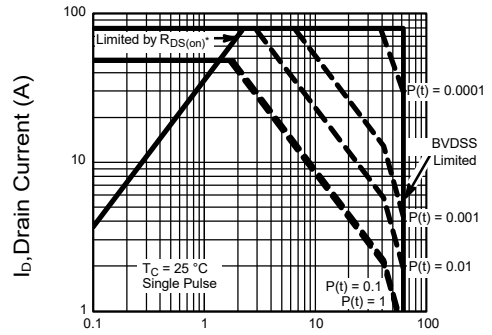


Figure 10: Safe Operating Area

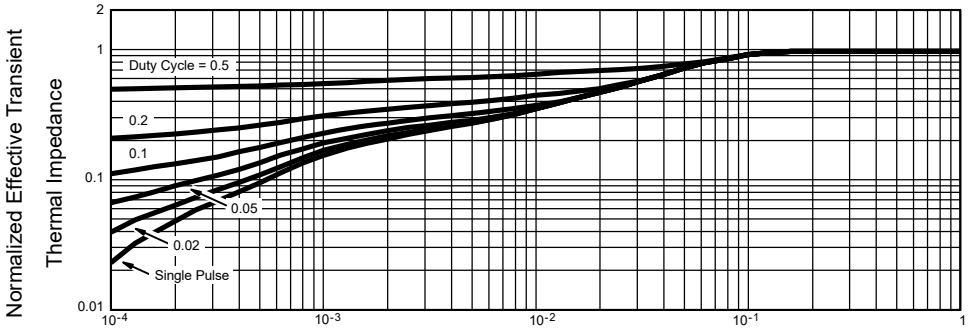
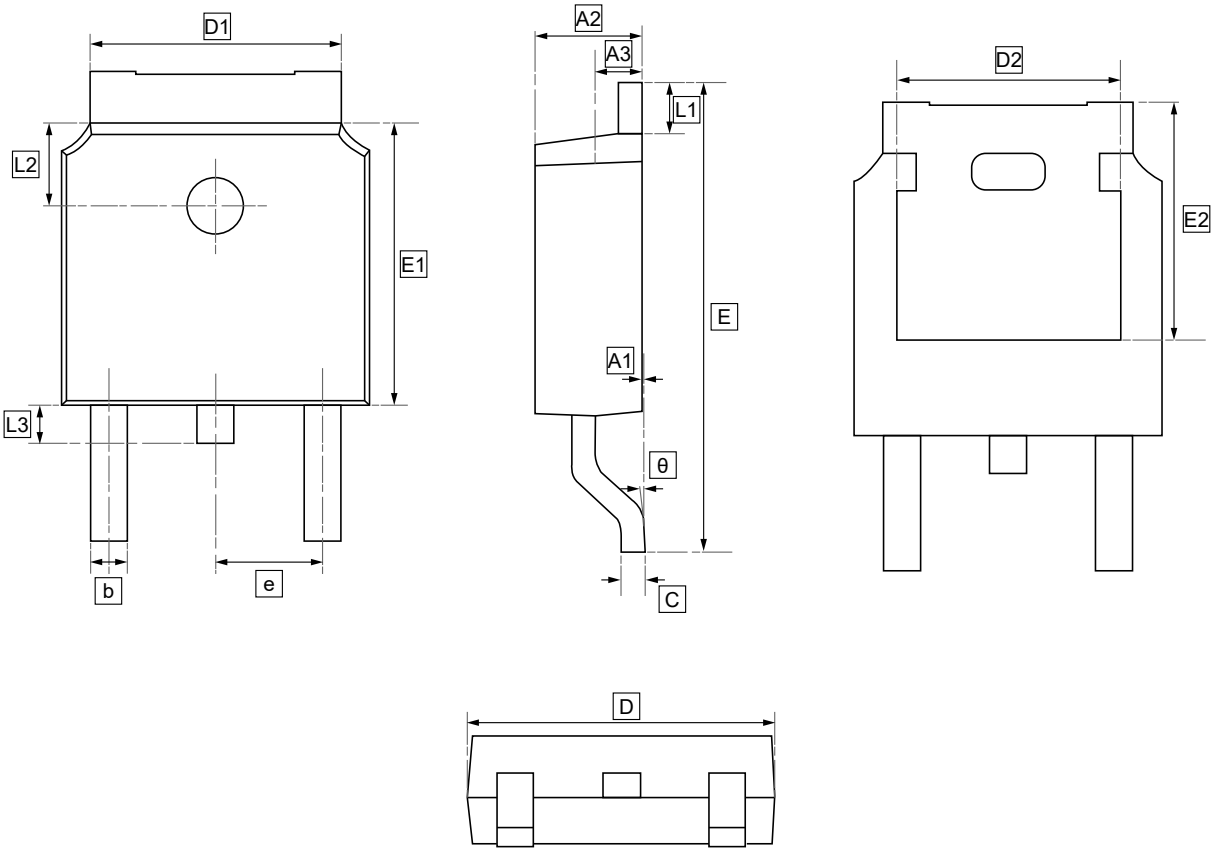


Figure 11: Normalized Thermal Transient Impedance, Junction-to-Case

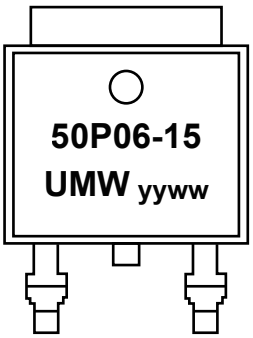
8.TO-252 Package Outline Dimensions



DIMENSIONS (mm are the original dimensions)

Symbol	A1	A2	A3	b	c	D	D1	D2	E	E1	E2	e	L1	L2	L3	θ
Min	0.00	2.18	0.90	0.65	0.46	6.35	4.95	4.32	9.40	5.97	5.21	2.286	0.89	1.70	0.60	0.00
Max	0.13	2.39	1.10	0.85	0.61	6.73	5.46	4.90	10.41	6.22	5.38	BSC	1.27	1.90	1.00	8.00

9.Ordering information



yy: Year Code
ww: Week Code

Order Code	Package	Base QTY	Delivery Mode
UMW SUD50P06-15	TO-252	2500	Tape and reel

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