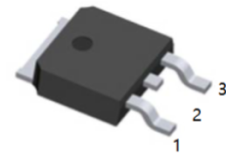


**PRODUCT SUMMARY**

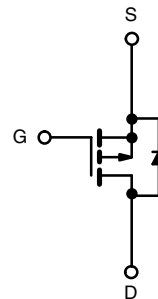
- $V_{DS} (V) = -60V$
- $R_{DS(ON)} < 15m\Omega (V_{GS} = -10V)$
- $R_{DS(ON)} < 20m\Omega (V_{GS} = -4.5V)$



1.G 2.D 3.S  
TO-252(DPAK) top view

**APPLICATIONS**

- Load Switch



**ABSOLUTE MAXIMUM RATINGS ( $T_A = 25\text{ }^\circ\text{C}$ , unless otherwise noted)**

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	$V_{DS}$	- 60	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	
Continuous Drain Current ( $T_J = 175\text{ }^\circ\text{C}$ )	$I_D$	$T_C = 25\text{ }^\circ\text{C}$	- 50 <sup>d</sup>
		$T_C = 125\text{ }^\circ\text{C}$	- 27.5
Pulsed Drain Current	$I_{DM}$	- 80	A
Avalanche Current	$I_{AS}$	- 50	
Single Pulse Avalanche Energy <sup>a</sup>	$E_{AS}$	125	mJ
Power Dissipation	$P_D$	$T_C = 25\text{ }^\circ\text{C}$	113 <sup>c</sup>
		$T_A = 25\text{ }^\circ\text{C}$	2.5 <sup>b, c</sup>
Operating Junction and Storage Temperature Range	$T_J, T_{stg}$	- 55 to 150	$^\circ\text{C}$

**THERMAL RESISTANCE RATINGS**

Parameter	Symbol	Typical	Maximum	Unit
Junction-to-Ambient <sup>b</sup>	$R_{thJA}$	$t \leq 10\text{ s}$	15	18
		Steady State	40	50
Junction-to-Case	$R_{thJC}$	0.82	1.1	$^\circ\text{C/W}$

Notes:

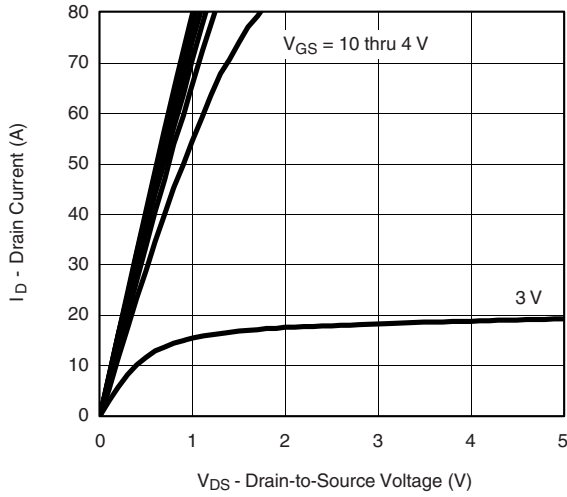
- a. Duty cycle  $\leq 1\%$ .
- b. When mounted on 1" square PCB (FR-4 material).
- c. See SOA curve for voltage derating.
- d. Package limited.

### SPECIFICATIONS ( $T_J = 25\text{ }^\circ\text{C}$ , unless otherwise noted)

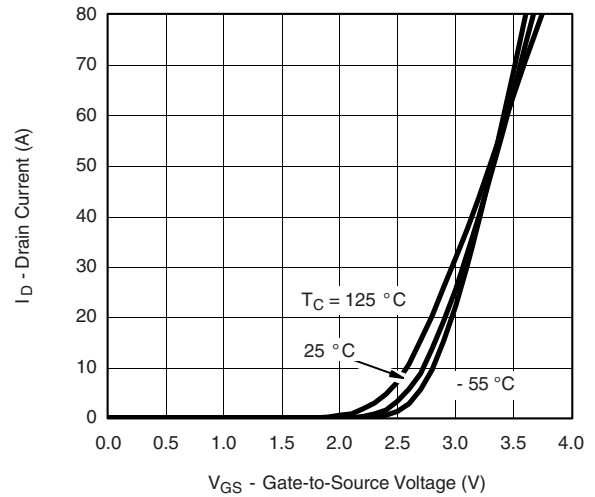
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
<b>Static</b>						
Drain-Source Breakdown Voltage	$V_{DS}$	$V_{GS} = 0\text{ V}, I_D = -250\text{ }\mu\text{A}$	-60			V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250\text{ }\mu\text{A}$	-1.1	-1.8	-2.5	
Gate-Body Leakage	$I_{GSS}$	$V_{DS} = 0\text{ V}, V_{GS} = \pm 20\text{ V}$			$\pm 100$	nA
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = -60\text{ V}, V_{GS} = 0\text{ V}$			-1	$\mu\text{A}$
		$V_{DS} = -60\text{ V}, V_{GS} = 0\text{ V}, T_J = 125\text{ }^\circ\text{C}$			-50	
		$V_{DS} = -60\text{ V}, V_{GS} = 0\text{ V}, T_J = 150\text{ }^\circ\text{C}$			-100	
On-State Drain Current <sup>a</sup>	$I_{D(on)}$	$V_{DS} = -5\text{ V}, V_{GS} = -10\text{ V}$	-50			A
Drain-Source On-State Resistance <sup>a</sup>	$R_{DS(on)}$	$V_{GS} = -10\text{ V}, I_D = -17\text{ A}$		12	15	m $\Omega$
		$V_{GS} = -10\text{ V}, I_D = -50\text{ A}, T_J = 125\text{ }^\circ\text{C}$			25	
		$V_{GS} = -10\text{ V}, I_D = -50\text{ A}, T_J = 150\text{ }^\circ\text{C}$			28	
		$V_{GS} = -4.5\text{ V}, I_D = -14\text{ A}$			20	
Forward Transconductance <sup>a</sup>	$g_{fs}$	$V_{DS} = -15\text{ V}, I_D = -17\text{ A}$		61		S
<b>Dynamic<sup>b</sup></b>						
Input Capacitance	$C_{iss}$	$V_{GS} = 0\text{ V}, V_{DS} = -25\text{ V}, f = 1\text{ MHz}$		4950		pF
Output Capacitance	$C_{oss}$			480		
Reverse Transfer Capacitance	$C_{rss}$			405		
Total Gate Charge <sup>c</sup>	$Q_g$	$V_{DS} = -30\text{ V}, V_{GS} = -10\text{ V}, I_D = -50\text{ A}$		110	165	nC
Gate-Source Charge <sup>c</sup>	$Q_{gs}$			19		
Gate-Drain Charge <sup>c</sup>	$Q_{gd}$			28		
Turn-On Delay Time <sup>c</sup>	$t_{d(on)}$	$V_{DD} = -30\text{ V}, R_L = 0.6\text{ }\Omega$ $I_D \cong -50\text{ A}, V_{GEN} = -10\text{ V}, R_G = 6\text{ }\Omega$		15	23	ns
Rise Time <sup>c</sup>	$t_r$			70	105	
Turn-Off Delay Time <sup>c</sup>	$t_{d(off)}$			175	260	
Fall Time <sup>c</sup>	$t_f$			175	260	
<b>Source-Drain Diode Ratings and Characteristics <math>T_C = 25\text{ }^\circ\text{C}</math><sup>b</sup></b>						
Continuous Current	$I_S$				-50	A
Pulsed Current	$I_{SM}$				-80	
Forward Voltage <sup>a</sup>	$V_{SD}$	$I_F = -50\text{ A}, V_{GS} = 0\text{ V}$		-1	-1.6	V
Reverse Recovery Time	$t_{rr}$	$I_F = -50\text{ A}, dI/dt = 100\text{ A}/\mu\text{s}$		45	70	ns

Notes:

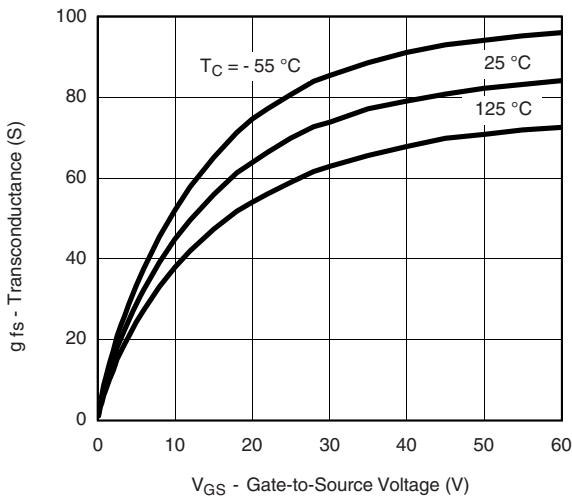
- a. Pulse test; pulse width  $\leq 300\text{ }\mu\text{s}$ , duty cycle  $\leq 2\%$ .
- b. Guaranteed by design, not subject to production testing.
- c. Independent of operating temperature.



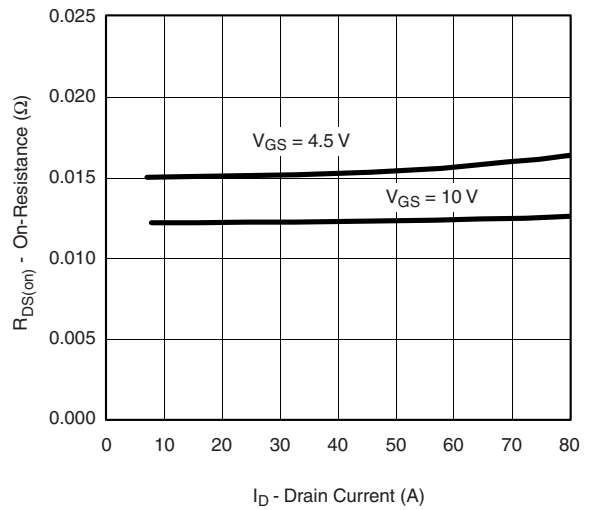
**Output Characteristics**



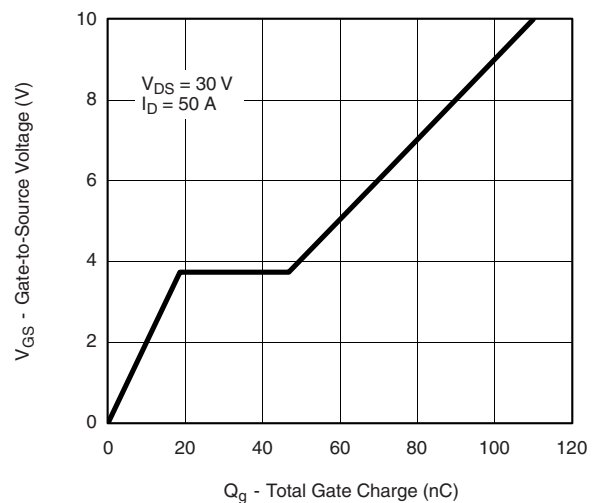
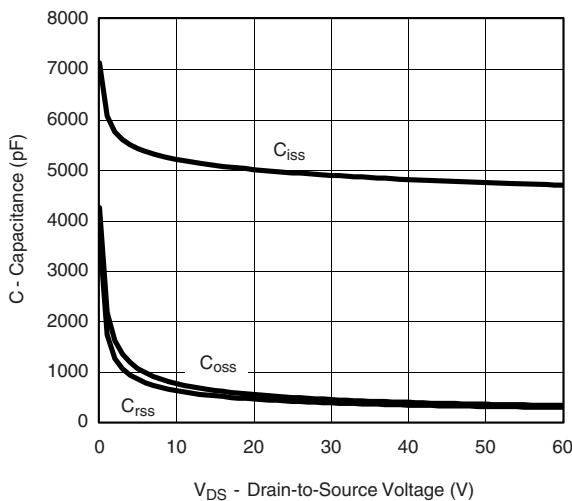
**Transfer Characteristics**



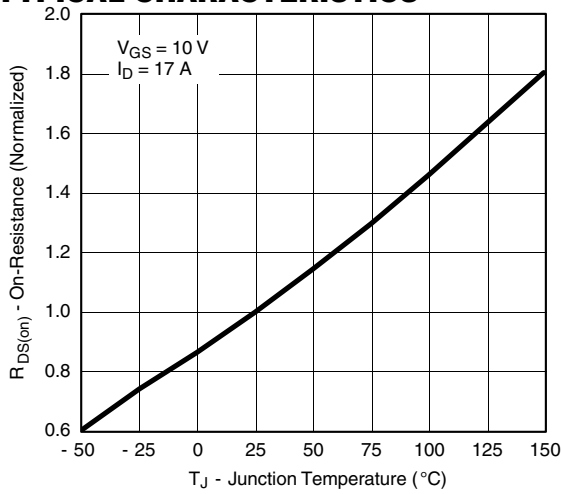
**Transconductance**



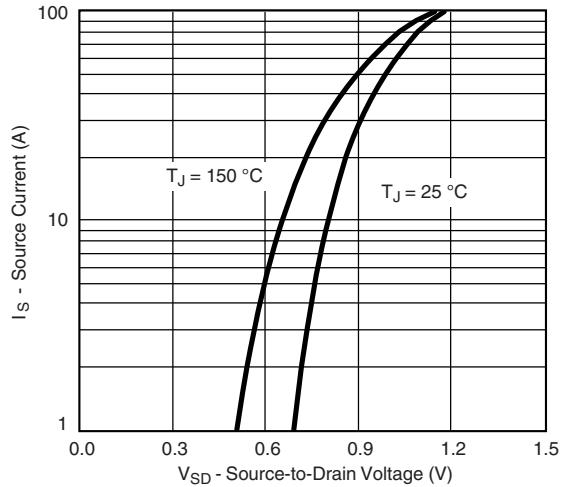
**On-Resistance vs. Drain Current**



**TYPICAL CHARACTERISTICS**

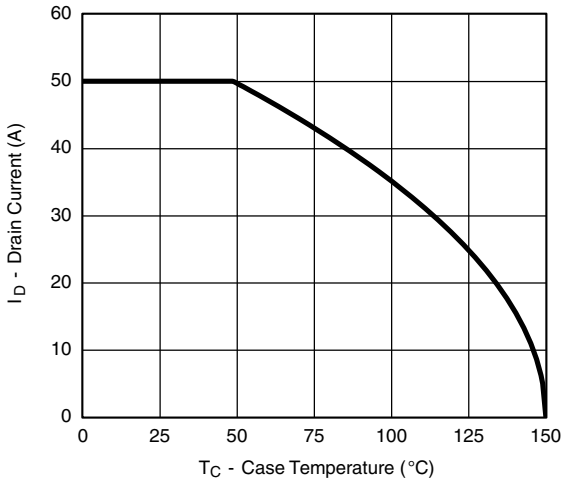


On-Resistance vs. Junction Temperature

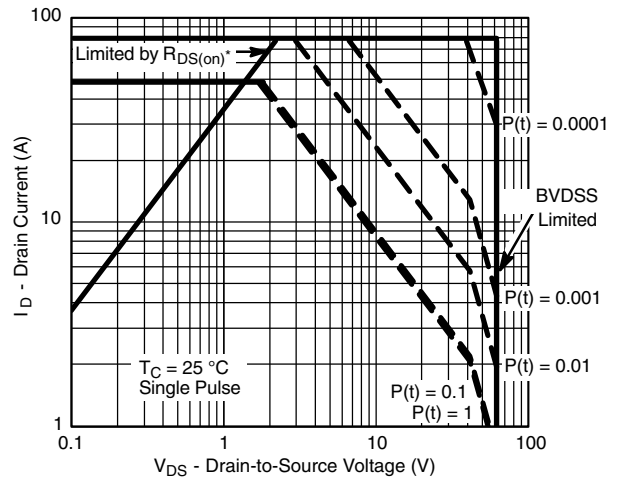


Source-Drain Diode Forward Voltage

**THERMAL RATINGS (25 °C, unless otherwise noted)**

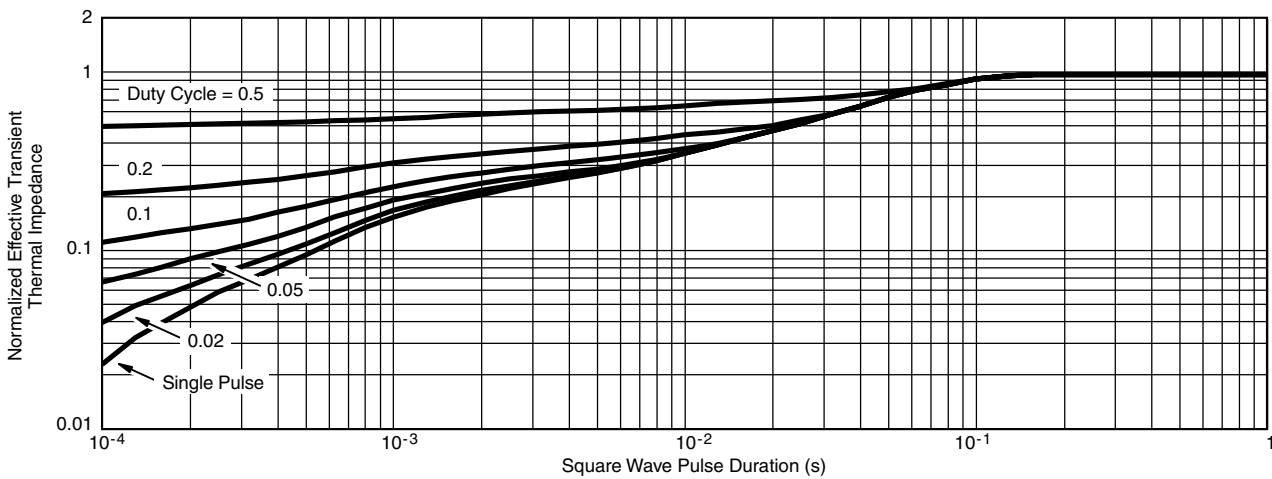


Drain Current vs. Case Temperature



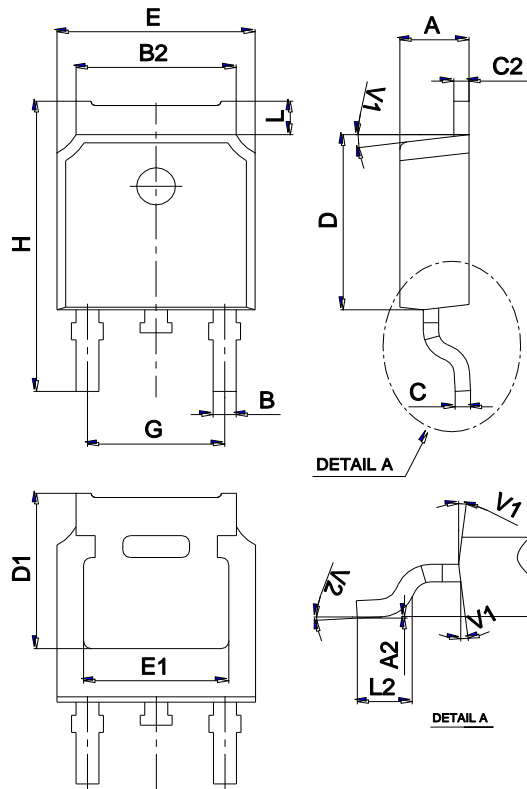
\*  $V_{GS} >$  minimum  $V_{GS}$  at which  $R_{DS(on)}$  is specified

Safe Operating Area



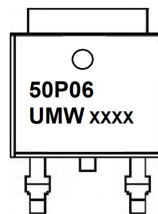
Normalized Thermal Transient Impedance, Junction-to-Case

Package Mechanical Data TO-252



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	2.10		2.50	0.083		0.098
A2	0		0.10	0		0.004
B	0.66		0.86	0.026		0.034
B2	5.18		5.48	0.202		0.216
C	0.40		0.60	0.016		0.024
C2	0.44		0.58	0.017		0.023
D	5.90		6.30	0.232		0.248
D1	5.30REF			0.209REF		
E	6.40		6.80	0.252		0.268
E1	4.63			0.182		
G	4.47		4.67	0.176		0.184
H	9.50		10.70	0.374		0.421
L	1.09		1.21	0.043		0.048
L2	1.35		1.65	0.053		0.065
V1		7°			7°	
V2	0°		6°	0°		6°

Marking



Ordering information

Order code	Package	Baseqty	Deliverymode
UMW SUD50P06-15	TO-252	2500	Tape and reel