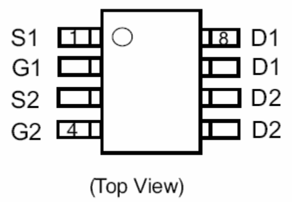
WPMD3002

Dual P-Channel, -30V, -4.9A, Power MOSFET

Http//:www.willsemi.com

V_{DS} (V)	Rds(on) (Ω)
-30	0.049@ V_{GS}=-10V
	0.070@ V_{GS}=-4.5V

SOP-8L



Pin configuration (Top view)

Descriptions

The WPMD3002 is the Dual P-Channel logic mode power field effect transistors are produced using high cell density, DMOS trench technology. This high density process is especially tailored to minimize on-state resistance. These devices are particularly suited for low voltage application, notebook computer power management and other battery powered circuits where high-side switching.

WPM3002
● YYWW

WPM3002 = Device Code
YY = Year
WW = Week

Marking

Features

- Super high density cell design for extremely low $R_{DS(ON)}$
- Exceptional on-resistance and maximum DC current capability
- SOP-8L package design

Applications

- Power Management in Note book
- Portable Equipment
- Battery Powered System
- DC/DC Converter
- Load Switch
- DSC
- LCD Display inverter

Order information

Device	Package	Shipping
WPMD3002-8/TR	SOP-8L	2500/Reel&Tape

Absolute Maximum ratings

Parameter		Symbol	10 S	Steady State	Unit
Drain-Source Voltage		V_{DS}	-30		V
Gate-Source Voltage		V_{GS}	±20		V
Continuous Drain Current [a]	T_A=25°C	I_D	-4.9	-3.8	A
	T_A=70°C		-3.9	-3.0	
Maximum Power Dissipation [a]	T_A=25°C	P_D	1.9	1.1	W
	T_A=70°C		1.2	0.7	
Continuous Drain Current [b]	T_A=25°C	I_D	-4.5	-3.6	A
	T_A=70°C		-3.6	-2.9	
Maximum Power Dissipation [b]	T_A=25°C	P_D	1.6	1.0	W
	T_A=70°C		1.0	0.6	
Pulsed Drain Current [c]		I_{DM}	-30		A
Operating Junction Temperature		T_J	150		°C
Lead Temperature		T_L	260		°C
Storage Temperature Range		T_{stg}	-55 to 150		°C

Thermal resistance ratings

Single Operation					
Parameter		**Symbol**	**Typical**	**Maximum**	**Unit**
Junction-to-Ambient Thermal Resistance [a]	t ≤ 10 s	$R_{\theta JA}$	56	65	°C/W
	Steady State		87	105	
Junction-to-Ambient Thermal Resistance [b]	t ≤ 10 s	$R_{\theta JA}$	64	76	
	Steady State		96	115	
Junction-to-Case Thermal Resistance	Steady State	$R_{\theta JC}$	32	40	
Dual Operation					
Junction-to-Ambient Thermal Resistance [a]	t ≤ 10 s	$R_{\theta JA}$	61	70	°C/W
	Steady State		92	112	
Junction-to-Ambient Thermal Resistance [b]	t ≤ 10 s	$R_{\theta JA}$	69	82	
	Steady State		102	120	
Junction-to-Case Thermal Resistance	Steady State	$R_{\theta JC}$	36	45	

a Surface mounted on FR4 Board using 1 square inch pad size, 1oz copper

b Surface mounted on FR4 board using minimum pad size, 1oz copper

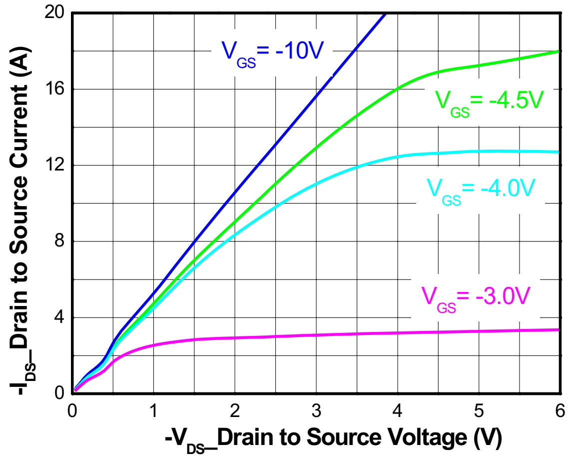
c Repetitive rating, pulse width limited by junction temperature, t_p=10μs, Duty Cycle=1%

d Repetitive rating, pulse width limited by junction temperature T_J=150°C.

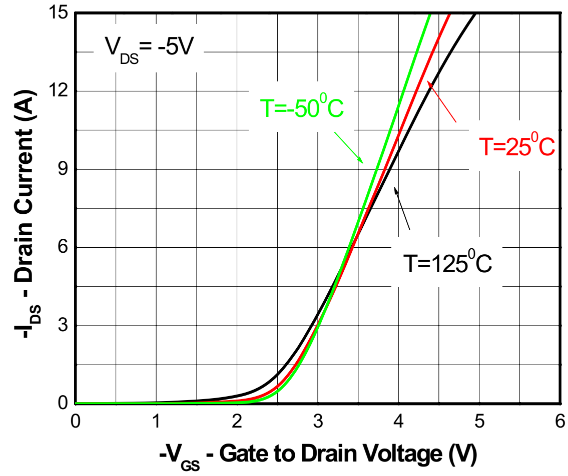
Electronics Characteristics (Ta=25°C, unless otherwise noted)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Drain-to-Source Breakdown Voltage	BV_{DSS}	V_{GS} = 0 V, I_D = -250uA	-30			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = -24 V, V_{GS} = 0V			-1	uA
Gate-to-source Leakage Current	I_{GSS}	V_{DS} = 0 V, V_{GS} = ±20V			±100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	V_{GS} = V_{DS}, I_D = -250uA	-1.5	-1.9	-2.5	V
Drain-to-source On-resistance	$R_{DS(on)}$	V_{GS} = -10V, I_D = -4.9A		49	60	mΩ
		V_{GS} = -10V, I_D = -3.0A		49	60	
		V_{GS} = -4.5V, I_D = -4.0A		70	90	
		V_{GS} = -4.5V, I_D= -3.0A		70	90	
Forward Transconductance	g_{FS}	V_{DS} = -15 V, I_D = -3.0A		5.0		S
CHARGES, CAPACITANCES AND GATE RESISTANCE						
Input Capacitance	C_{ISS}	V_{GS} = 0 V, f = 1.0 MHz, V_{DS} = -15 V		670		pF
Output Capacitance	C_{OSS}			75		
Reverse Transfer Capacitance	C_{RSS}			62		
Total Gate Charge	$Q_{G(TOT)}$	V_{GS} = -10 V, V_{DS} = -15 V, I_D = -4.9 A		14.0		nC
Threshold Gate Charge	$Q_{G(TH)}$			1.31		
Gate-to-Source Charge	Q_{GS}			1.80		
Gate-to-Drain Charge	Q_{GD}			1.60		
SWITCHING CHARACTERISTICS						
Turn-On Delay Time	$t_{d(ON)}$	V_{GS} = -10 V, V_{DS} = -15V, R_L=5.0Ω , R_G=15 Ω		6.8		ns
Rise Time	t_r			3.2		
Turn-Off Delay Time	$t_{d(OFF)}$			25.2		
Fall Time	t_f			4.4		
BODY DIODE CHARACTERISTICS						
Forward Voltage	V_{SD}	V_{GS} = 0 V, I_S = -1.0A	-0.55	-0.78	-1.50	V

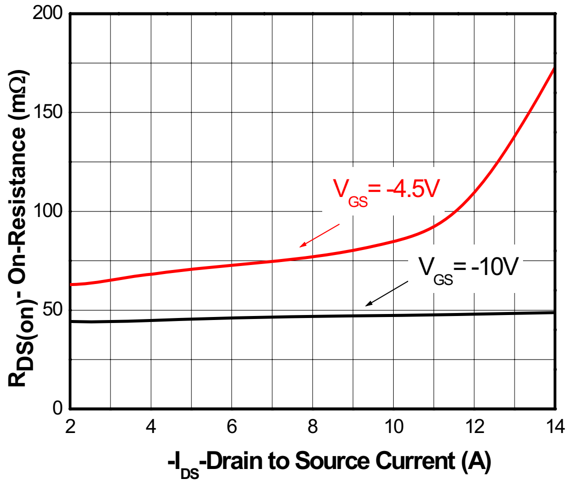
Typical Characteristics (Ta=25°C, unless otherwise noted)



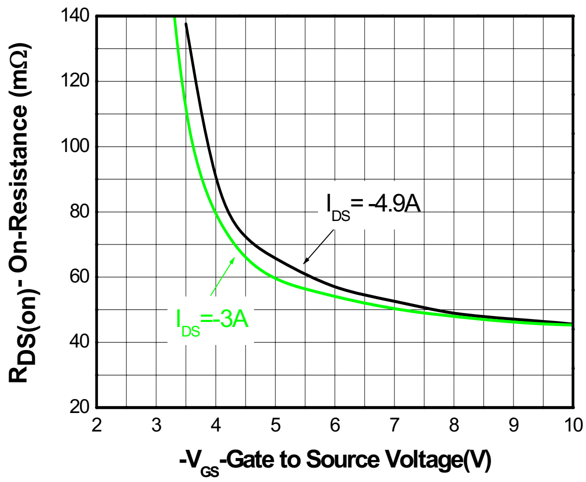
Output characteristics



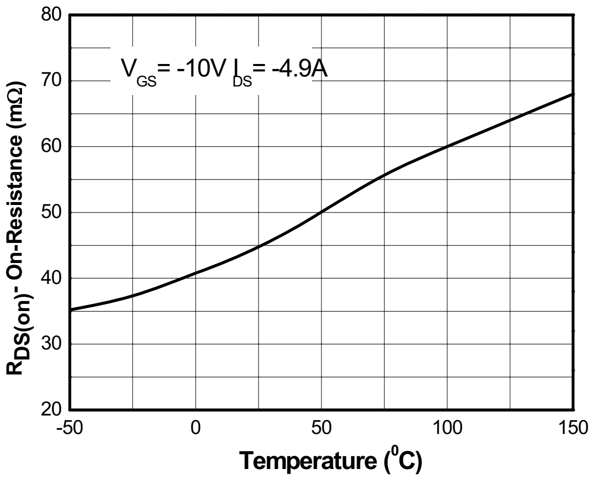
Transfer characteristics



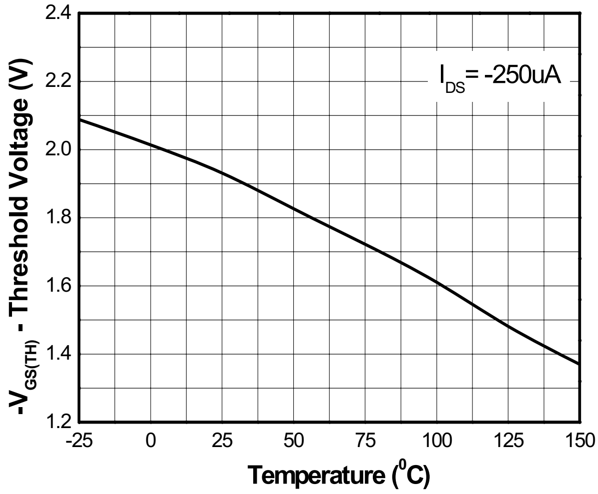
On-Resistance vs. Drain current



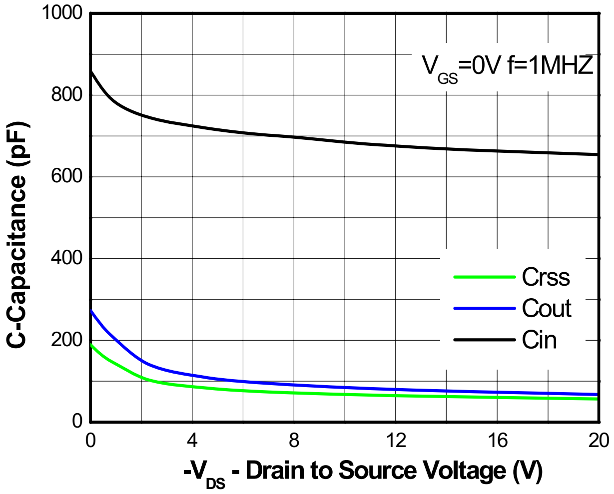
On-Resistance vs. Gate-to-Source voltage



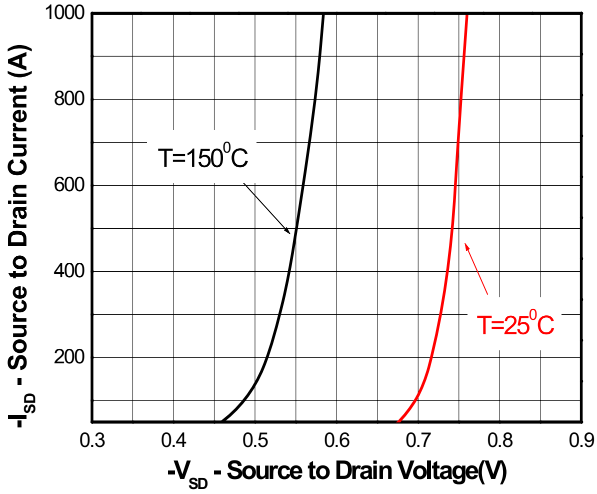
On-Resistance vs. Junction temperature



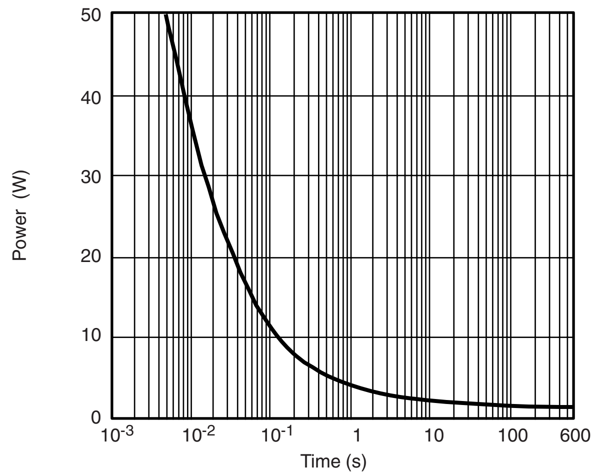
Threshold voltage vs. Temperature



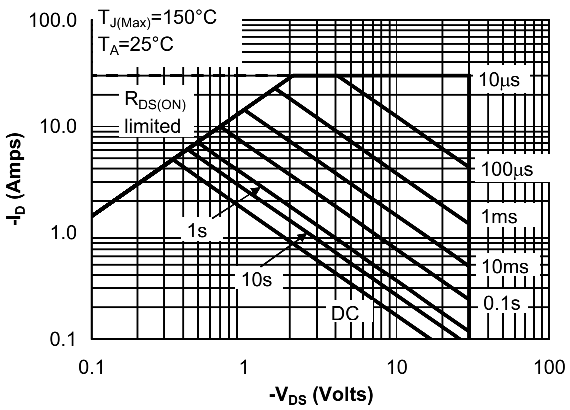
Capacitance



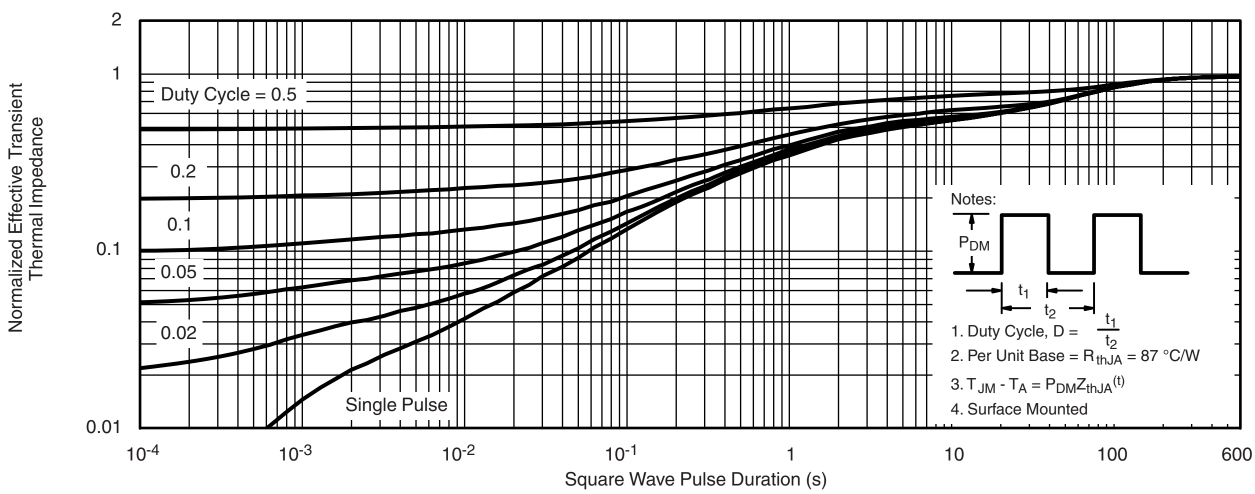
Body diode forward voltage



Single pulse power



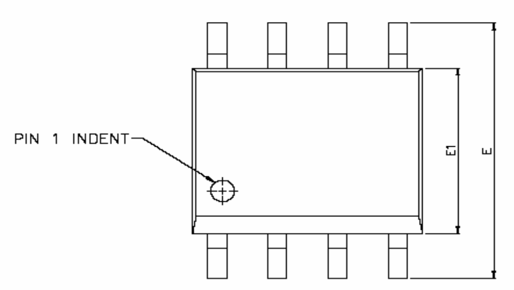
Safe operating power

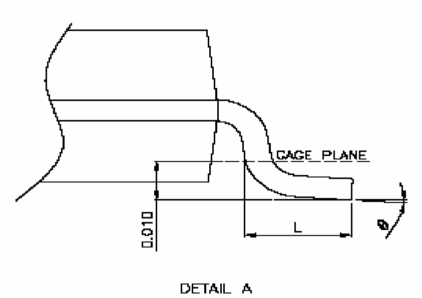


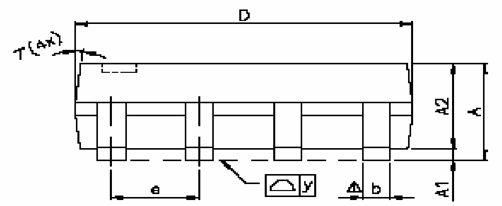
Normalized Thermal Transient Impedance, Junction-to-Ambient

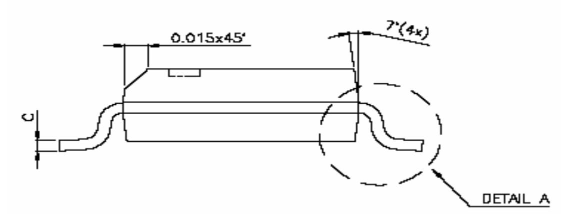
Package outline dimensions

SOP-8L









Symbol	Dimensions in millimeter		
	Min.	Typ.	Max.
A	1.47	1.60	1.73
A1	0.10		0.25
A2		1.45	
b	0.33	0.41	0.51
C	0.19	0.20	0.25
D	4.80	4.85	4.95
E	5.80	6.00	6.20
E1	3.80	3.90	4.00
e		1.27	
L	0.38	0.71	1.27
y			0.076
θ	0°		8°