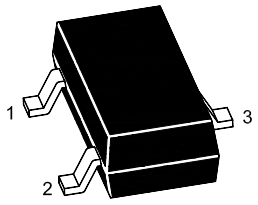
WPM5001

Single P-Channel, -50V, -0.3A, Power MOSFET

Http//:www.sh-willsemi.com

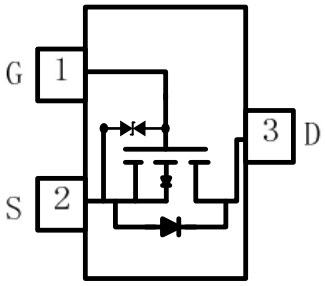
V_{DS} (V)	Typical Rds(on) (Ω)
-50	3.0@ V_{GS}= –10V
	3.5@ V_{GS}= –5V



SOT-23

Descriptions

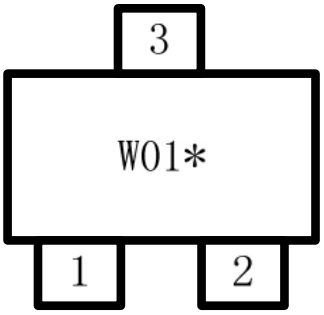
The WPM5001 is P-Channel enhancement MOS Field Effect Transistor. Uses advanced trench technology and design to provide excellent $R_{DS\ (ON)}$ with low gate charge. This device is suitable for use in DC-DC conversion, power switch and charging circuit. Standard Product WPM5001 is Pb-free and Halogen-free.



Pin configuration (Top view)

Features

- Trench Technology
- Supper high density cell design
- Excellent ON resistance for higher DC current
- Extremely Low Threshold Voltage
- Small package SOT-23



W=Willsemi
01= Device Code
***= Month (A~Z)**
Marking

Applications

- Driver for Relay, Solenoid, Motor, LED etc.
- DC-DC converter circuit
- Power Switch
- Load Switch
- Charging

Order information

Device	Package	Shipping
WPM5001-3/TR	SOT-23	3000/Reel&Tape

Absolute Maximum ratings

Parameter		Symbol	10 s	Steady State	Unit
Drain-Source Voltage		V_{DS}	-50		V
Gate-Source Voltage		V_{GS}	±20		
Continuous Drain Current [a d]	T_A=25°C	I_D	-0.37	-0.34	A
	T_A=70°C		-0.3	-0.27	
Maximum Power Dissipation [a d]	T_A=25°C	P_D	0.14	0.12	W
	T_A=70°C		0.09	0.07	
Continuous Drain Current [b]	T_A=25°C	I_D	-0.35	-0.3	A
	T_A=70°C		-0.29	-0.25	
Maximum Power Dissipation [b]	T_A=25°C	P_D	0.13	0.1	W
	T_A=70°C		0.08	0.06	
Pulsed Drain Current [c]		I_{DM}	-1		A
Operating Junction Temperature		T_J	-55 to 150		°C
Lead Temperature		T_L	260		°C
Storage Temperature Range		T_{stg}	-55 to 150		°C

Thermal resistance ratings

Parameter		Symbol	Typical	Maximum	Unit
Junction-to-Ambient Thermal Resistance [a]	t ≤ 10 s	$R_{\theta JA}$	150	178	°C/W
	Steady State		190	226	
Junction-to-Ambient Thermal Resistance [b]	t ≤ 10 s	$R_{\theta JA}$	165	196	
	Steady State		222	264	
Junction-to-Case Thermal Resistance	Steady State	$R_{\theta JC}$	73	88	

a Surface mounted on FR-4 Board using 1 square inch pad size, 1oz copper

b Surface mounted on FR-4 board using minimum pad size, 1oz copper

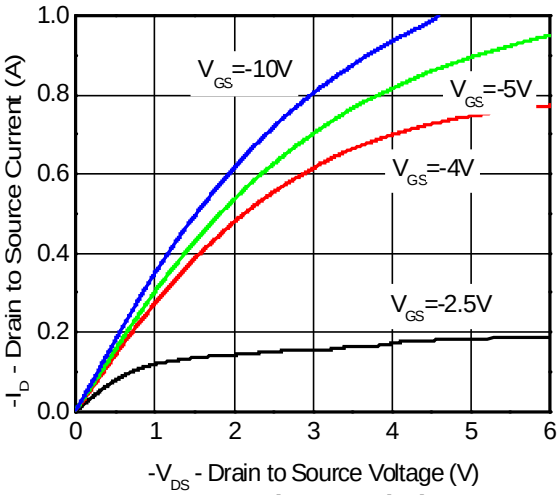
c Pulse width<380μs, Duty Cycle<2%

d Maximum junction temperature T_J=150°C.

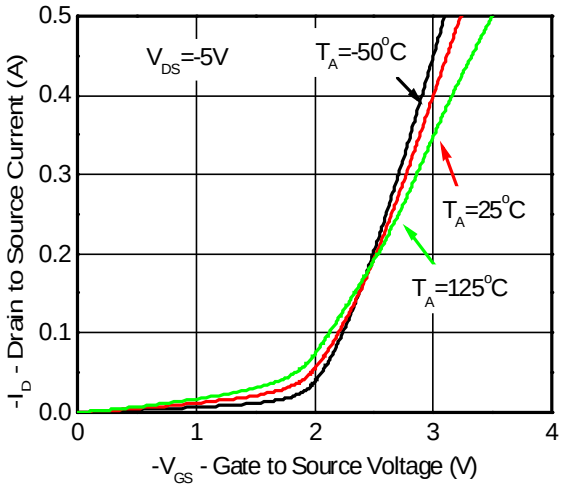
Electronics Characteristics (Ta=25°C, unless otherwise noted)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Drain-to-Source Breakdown Voltage	BV_{DSS}	V_{GS} = 0 V, I_D = -250uA	-50			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = -10V, V_{GS} = 0V			-5	uA
Gate-to-source Leakage Current	I_{GSS}	V_{DS} = 0 V, V_{GS} = ±20V			±5	uA
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	V_{GS} = V_{DS}, I_D = -250uA	-0.8	-1.5	-2.0	V
Drain-to-source On-resistance [b, c]	$R_{DS(on)}$	V_{GS} = -10V, I_D = -0.4A		3.0	8	Ω
		V_{GS} = -5V, I_D = -0.3A		3.5	10	
Forward Trans conductance	g_{fs}	V_{DS} = -25V, I_D = -0.4A		0.4		S
CAPACITANCES, CHARGES						
Input Capacitance	C_{ISS}	V_{GS} = 0 V,		66.7		pF
Output Capacitance	C_{OSS}	f = 1.0 MHz,		27.4		
Reverse Transfer Capacitance	C_{RSS}	V_{DS} = -10 V		17.8		
Total Gate Charge	$Q_{G(TOT)}$	V_{GS} = -10V,		0.89		nC
Gate-to-Source Charge	Q_{GS}	V_{DD} = -25 V,		0.16		
Gate-to-Drain Charge	Q_{GD}	I_D = -0.4A		0.57		
SWITCHING CHARACTERISTICS						
Turn-On Delay Time	td(ON)	V_{GS} = -10 V,		7.4		ns
Rise Time	tr	V_{DD} = -10 V,		4.2		
Turn-Off Delay Time	td(OFF)	I_D=0.4A,		11.6		
Fall Time	tf	R_G=6 Ω		9.0		
BODY DIODE CHARACTERISTICS						
Forward Voltage	V_{SD}	V_{GS} = 0 V, I_S = -0.25A		-0.9	-1.5	V

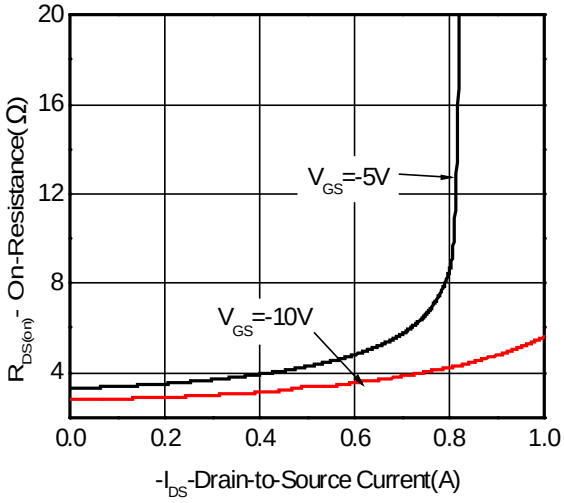
Typical Characteristics (Ta=25°C, unless otherwise noted)



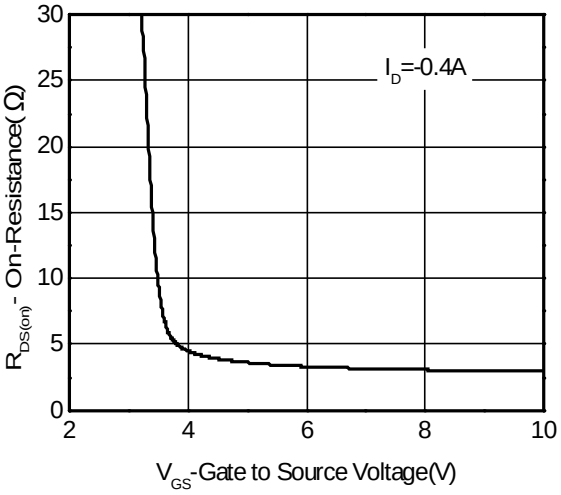
Output characteristics



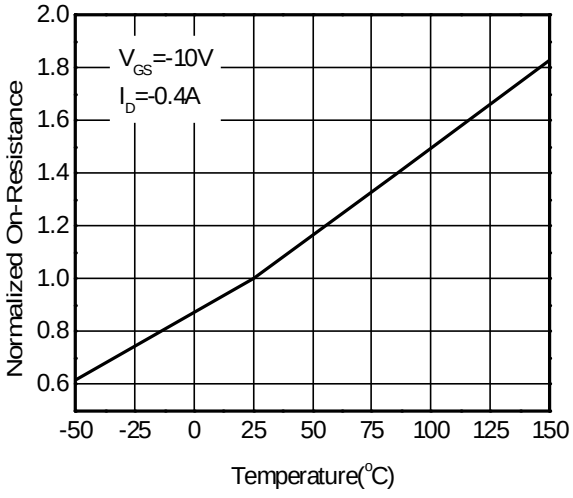
Transfer characteristics



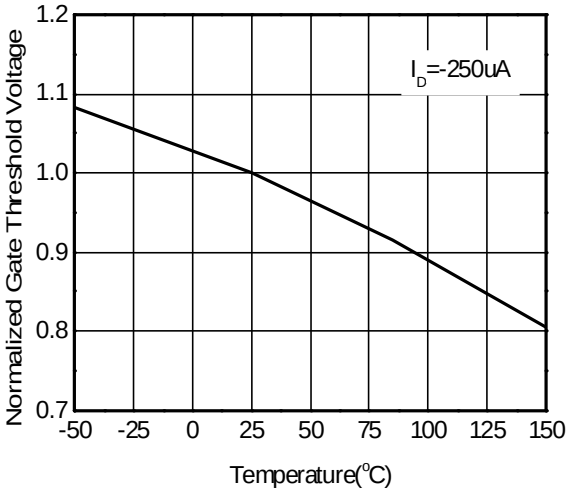
On-Resistance vs. Drain current



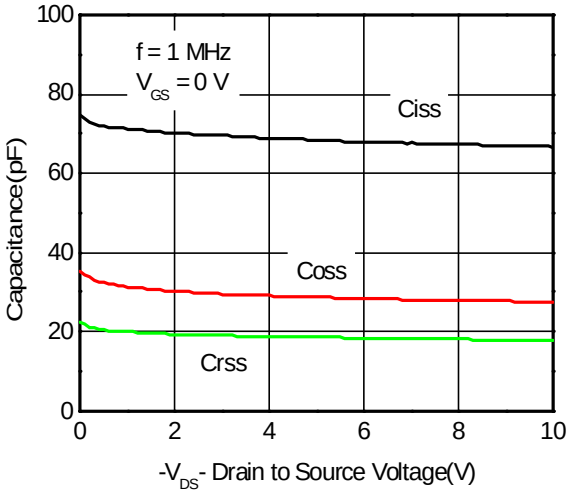
On-Resistance vs. Gate-to-Source voltage



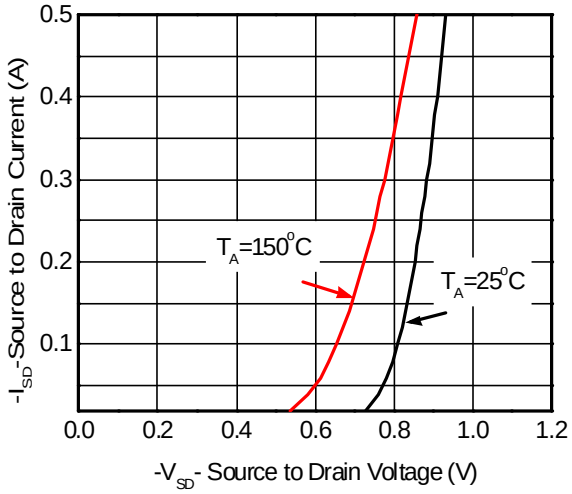
On-Resistance vs. Junction temperature



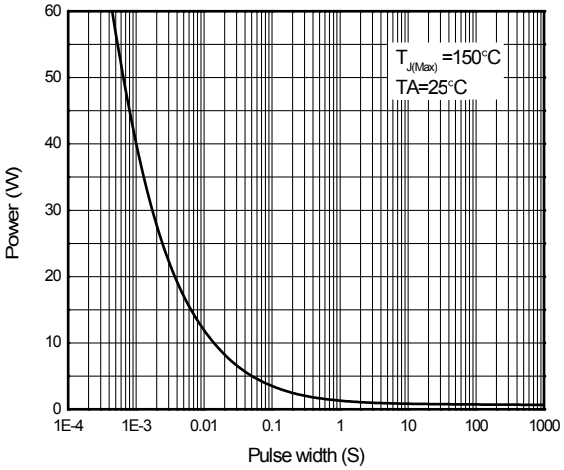
Threshold voltage vs. Temperature



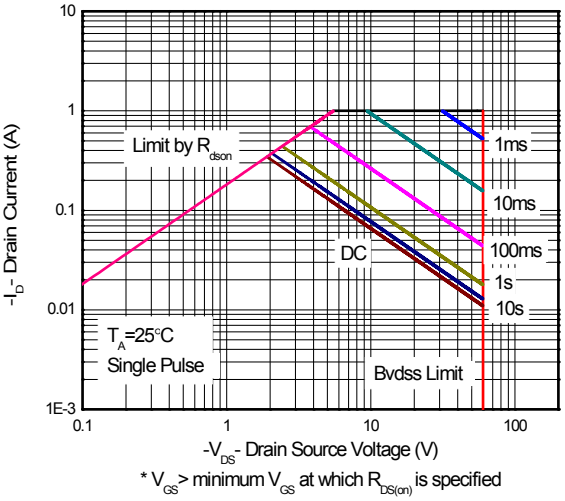
Capacitance



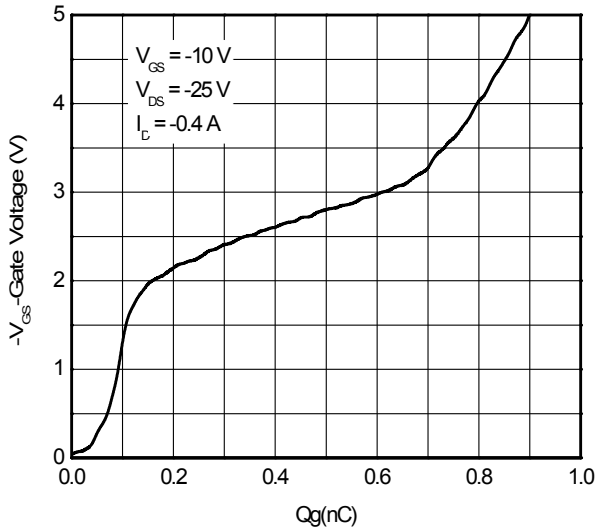
Body diode forward voltage



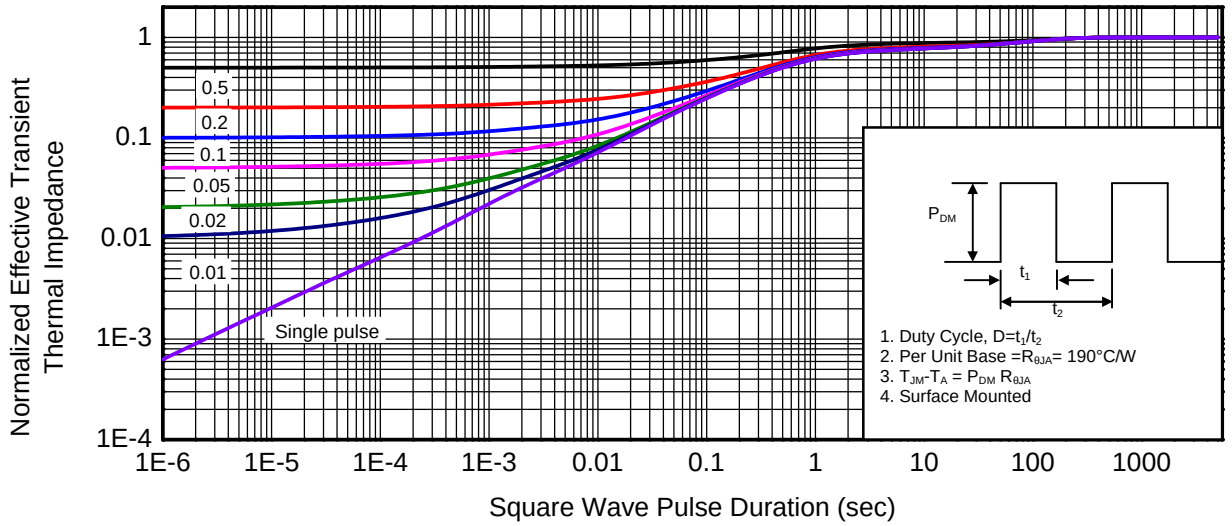
Single pulse power



Safe operating power



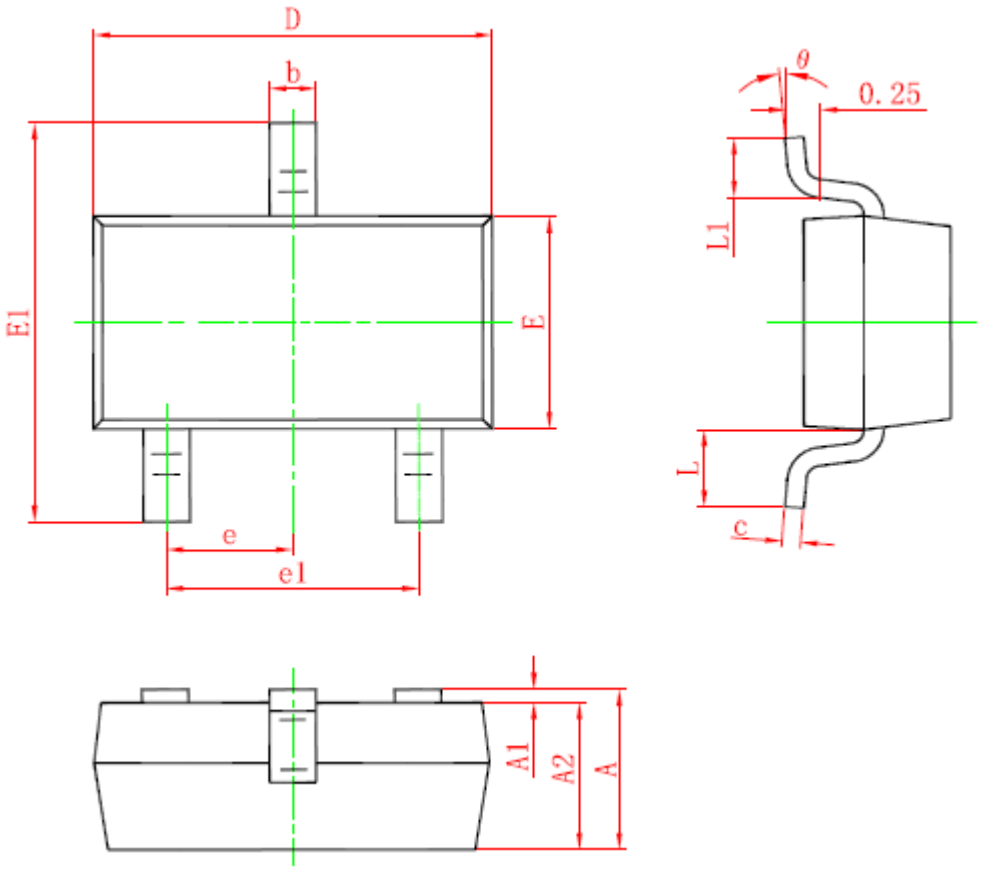
Gate charge Characteristics



Transient thermal response (Junction-to-Ambient)

Package outline dimensions

SOT-23



Symbol	Dimensions in millimeters	
	Min.	Max.
A	0.890	1.200
A1	0.000	0.100
A2	0.890	1.050
b	0.300	0.510
c	0.080	0.190
D	2.800	3.040
E	1.200	1.400
E1	2.200	2.600
e	0.890	1.020
e1	1.780	2.040
L	0.550 REF.	
L1	0.300	0.500
θ	0°	8°