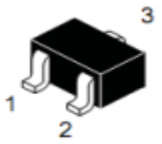
WPM6205

Single P-Channel, -20V, -4.8A, Power MOSFET

Http://www.sh-willsemi.com

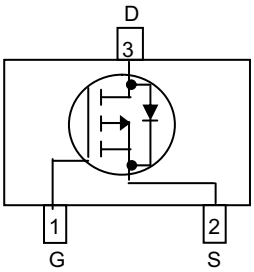
V_{DS} (V)	Typical $R_{DS(on)}$ (mΩ)
-20	33@ V_{GS}=-4.5V
	44@ V_{GS}=-2.5V
	65@ V_{GS}=-1.8V



SOT-23-3L

Descriptions

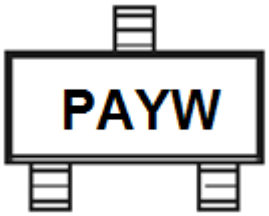
The WPM6205 is P-Channel enhancement MOS Field Effect Transistor. Uses advanced trench technology and design to provide excellent $R_{DS(ON)}$ with low gate charge. This device is suitable for use in DC-DC conversion, power switch and charging circuit. Standard Product WPM6205 is Pb-free.



Pin configuration (Top view)

Features

- Trench Technology
- Supper high density cell design
- Excellent ON resistance
- Extremely Low Threshold Voltage
- Small package SOT-23-3L



PA = Device Code
Y = Year
W = Week(A~z)

Marking

Applications

- DC/DC converters
- Power supply converters circuit
- Load/Power Switching for portable device

Order information

Device	Package	Shipping
WPM6205-3/TR	SOT-23-3L	3000/Tape&Reel

Absolute Maximum ratings

Parameter		Symbol	10 s	Steady State	Unit
Drain-Source Voltage		V_{DS}	-20		V
Gate-Source Voltage		V_{GS}	±12		
Continuous Drain Current [a d]	T_A=25°C	I_D	-4.8	-4.1	A
	T_A=70°C		-3.8	-3.3	
Maximum Power Dissipation [a d]	T_A=25°C	P_D	1.5	1.1	W
	T_A=70°C		0.9	0.7	
Continuous Drain Current [b d]	T_A=25°C	I_D	-4.2	-3.8	A
	T_A=70°C		-3.4	-3.0	
Maximum Power Dissipation [b d]	T_A=25°C	P_D	1.1	0.9	W
	T_A=70°C		0.7	0.6	
Pulsed Drain Current [c]		I_{DM}	-20		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

Single Operation					
Parameter		**Symbol**	**Typical**	**Maximum**	**Unit**
Junction-to-Ambient Thermal Resistance [a]	t ≤ 10 s	$R_{\theta JA}$	70	85	°C/W
	Steady State		90	115	
Junction-to-Ambient Thermal Resistance [b]	t ≤ 10 s	$R_{\theta JA}$	95	110	
	Steady State		110	135	
Junction-to-Case Thermal Resistance	Steady State	$R_{\theta JC}$	40	60	

.

a. Surface mounted on FR4 Board using 1 in sq pad size, 1oz Cu.

b. Surface mounted on FR4 board using the minimum recommended pad size, 1oz Cu.

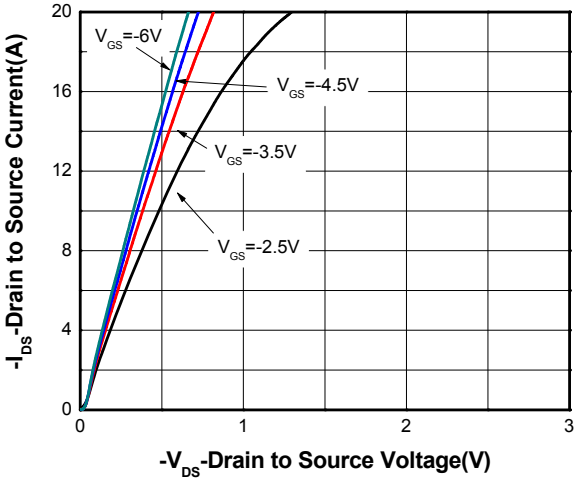
c. Repetitive rating, pulse width limited by junction temperature, tp=10μs, Duty Cycle=1%.

d. Repetitive rating, pulse width limited by junction temperature TJ(MAX)=150°C.

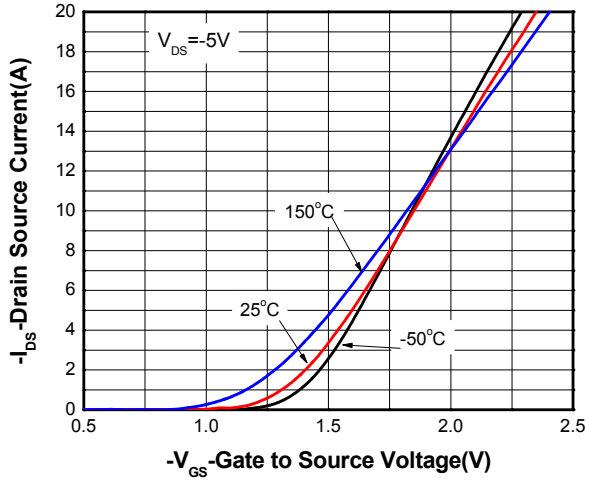
Electronics Characteristics (Ta=25°C, unless otherwise noted)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Drain-to-Source Breakdown Voltage	BV_{DSS}	V_{GS} = 0 V, I_D = -250uA	-20			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} =-16V, V_{GS} = 0V			-1	uA
Gate-to-source Leakage Current	I_{GSS}	V_{DS} = 0 V, V_{GS} = ±12V			±100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	V_{GS} = V_{DS}, I_D = -250uA	-0.4	-0.7	-1.0	V
Drain-to-source On-resistance	$R_{DS(on)}$	V_{GS} = -4.5V, I_D = -4.9A		33	43	mΩ
		V_{GS} =-2.5V,I_D = -3.1A		44	58	
		V_{GS} =-1.8V, I_D = -2.0A		65	88	
Forward Transconductance	g_{FS}	V_{DS} = -5 V, I_D = -3.0A		4	9	S
CHARGES, CAPACITANCES AND GATE RESISTANCE						
Input Capacitance	C_{ISS}	V_{GS} = 0 V, f = 1.0MHz, V_{DS} = -10 V		1251		pF
Output Capacitance	C_{OSS}			145		
Reverse Transfer Capacitance	C_{RSS}			124		
Total Gate Charge	$Q_{G(TOT)}$	V_{GS} = -4.5 V, V_{DS} = -10 V, I_D =-5.0 A		12		nC
Threshold Gate Charge	$Q_{G(TH)}$			0.85		
Gate-to-Source Charge	Q_{GS}			2.5		
Gate-to-Drain Charge	Q_{GD}			2.8		
SWITCHING CHARACTERISTICS						
Turn-On Delay Time	td(ON)	V_{GS} = -10 V, V_{DS} =-15 V, I_D=-5A, R_G=6Ω		7.8		ns
Rise Time	tr			6.4		
Turn-Off Delay Time	td(OFF)			80		
Fall Time	tf			18		
BODY DIODE CHARACTERISTICS						
Forward Voltage	V_{SD}	V_{GS} = 0 V, I_S = -1A	-0.5	-0.75	-1.1	V

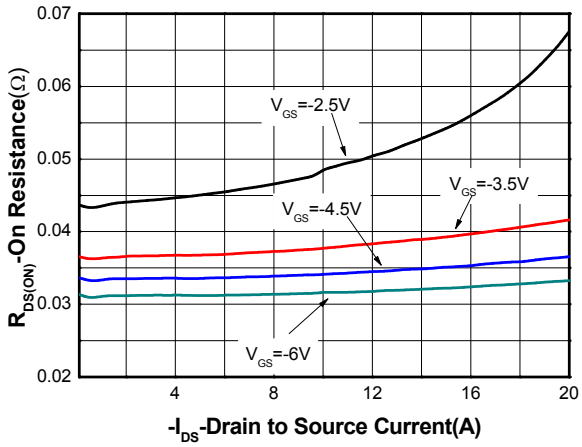
Typical Characteristics (Ta=25°C, unless otherwise noted)



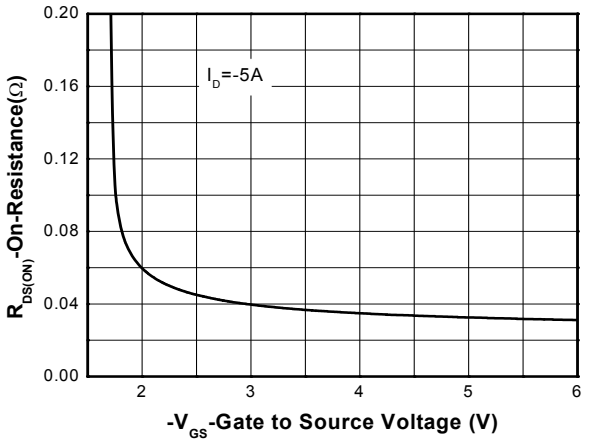
Output characteristics



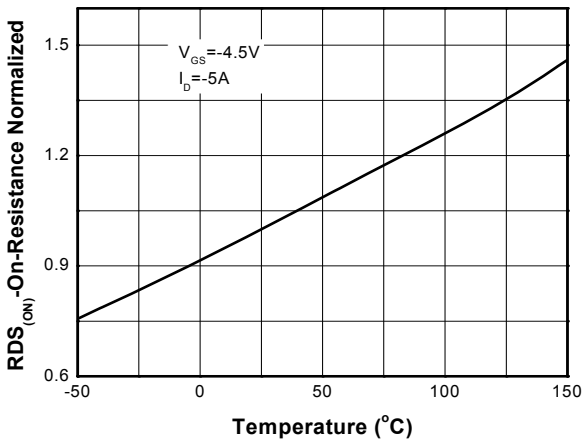
Transfer characteristics



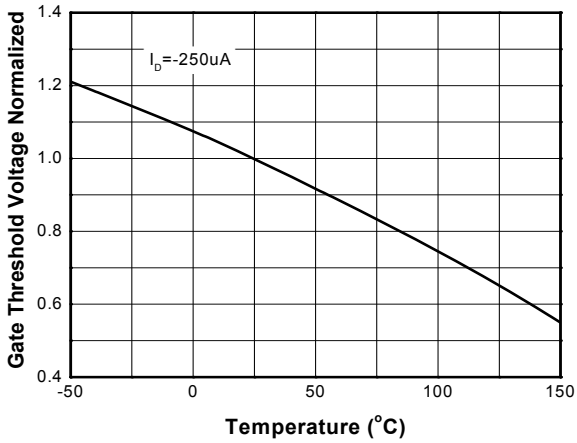
On-Resistance vs. Drain current



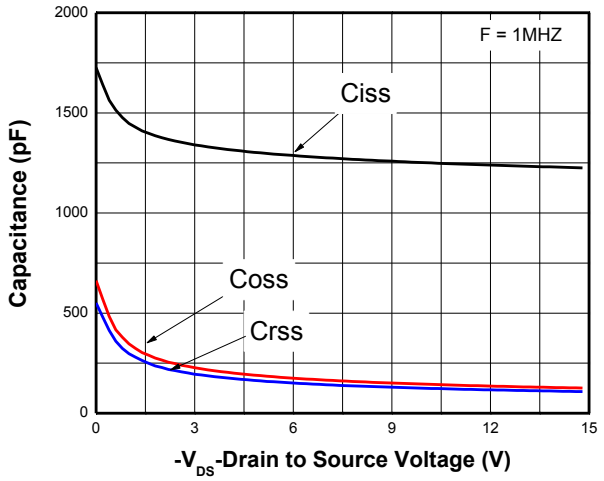
On-Resistance vs. Gate-to-source voltage



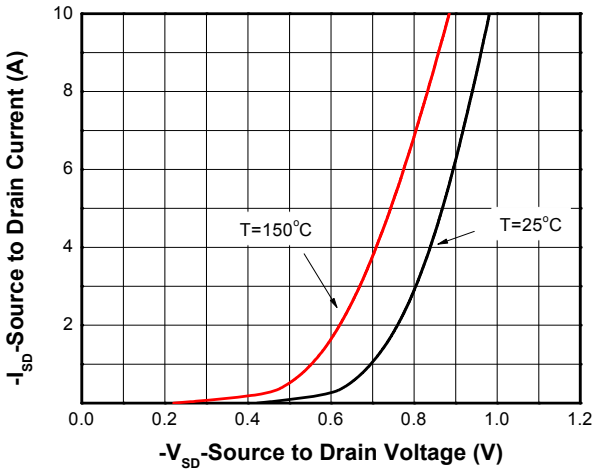
On-Resistance vs. Junction temperature



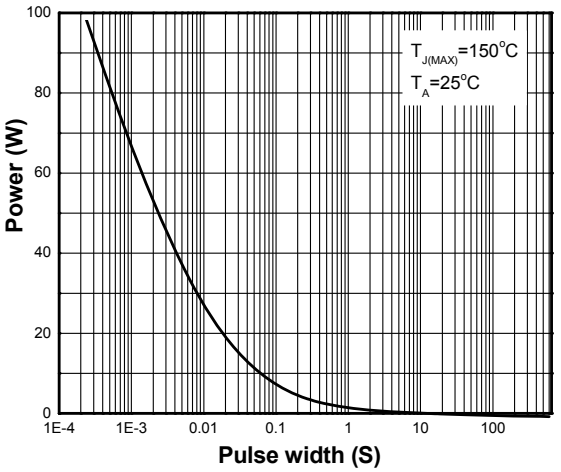
Threshold voltage vs. Temperature



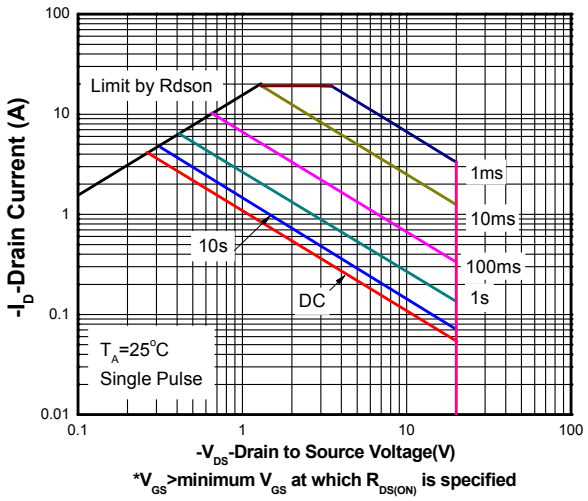
Capacitance



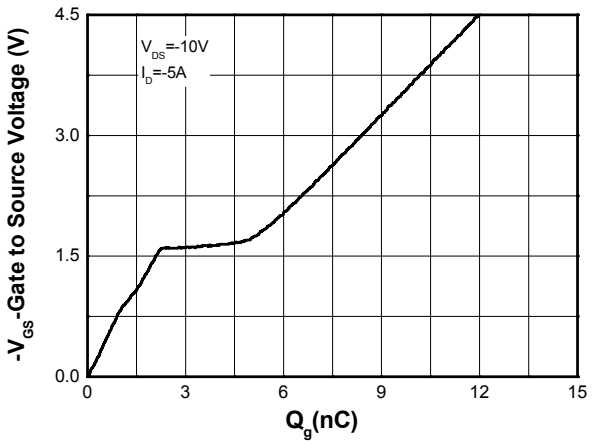
Body diode forward voltage



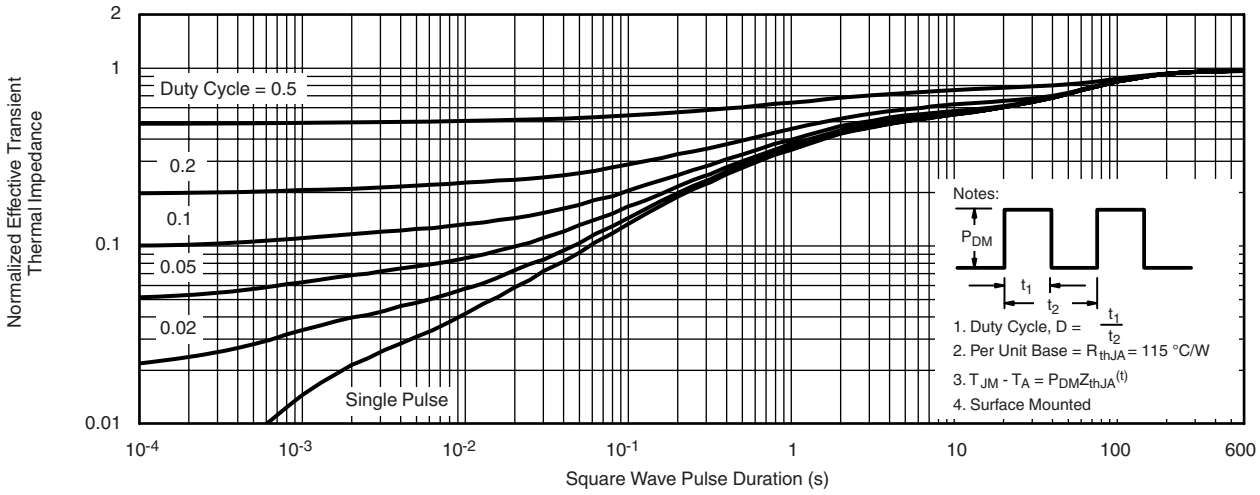
Single pulse power



Safe operating power



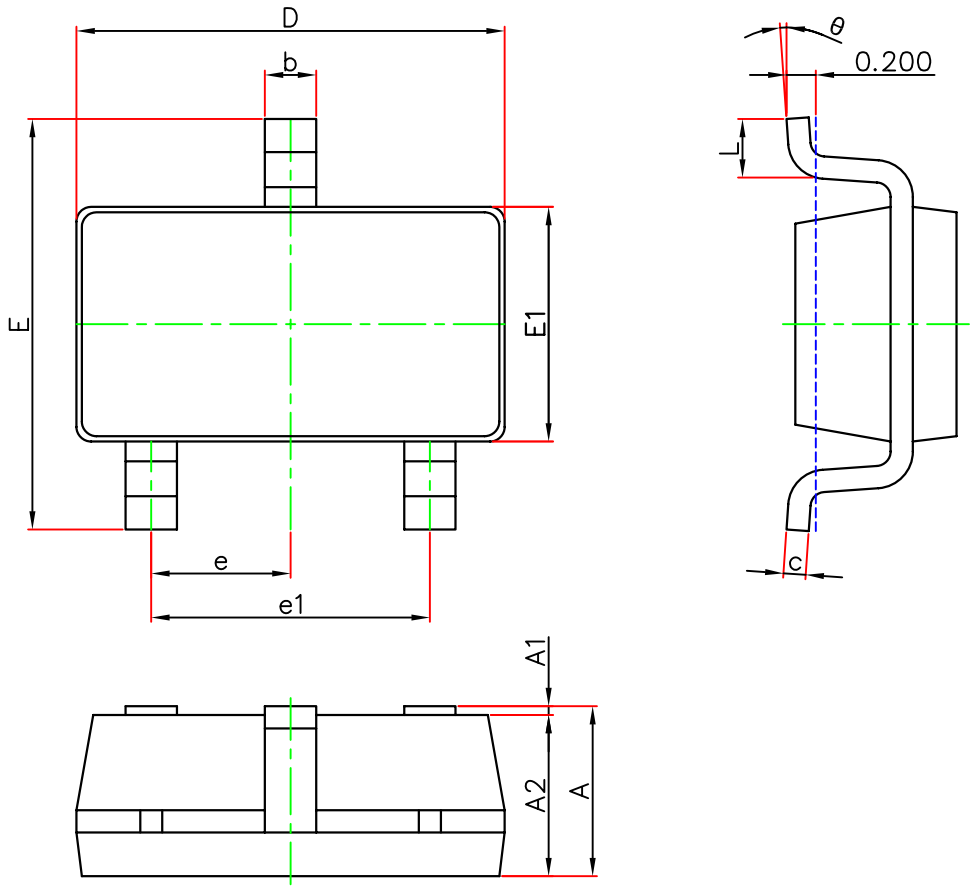
Gate Charge Characteristics



Transient thermal response (Junction-to-Ambient)

Package outline dimensions

SOT-23-3L



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E1	1.500	1.700	0.059	0.067
E	2.650	2.950	0.104	0.116
e	0.950(BSC)		0.037(BSC)	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°