

## WPM6207

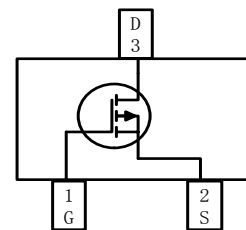
Single P-Channel, -20V, -5.7A, Power MOSFET

[www.sh-willsemi.com](http://www.sh-willsemi.com)

$V_{DS}$ (V)	Max $R_{ds(on)}$ (m $\Omega$ )
-20	30 @ $V_{GS} = -4.5V$
	40 @ $V_{GS} = -2.5V$
	60 @ $V_{GS} = -1.8V$



SOT-23-3



### Descriptions

The WPM6207 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 WPM6207 is Pb-free.

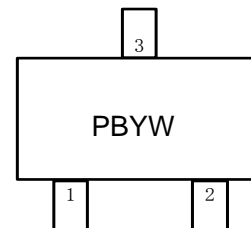
### Features

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

### Applications

- Power Management in Notebook Computer
- Portable Equipment
- Battery Powered Systems

### Pin configuration (Top view)



PB = Specific Device Code  
 Y = Year  
 W = Week

### Marking

### Order information

Device	Package	Shipping
WPM6207-3/TR	SOT-23-3	3000/Reel&Tape

**Absolute Maximum ratings**

Parameter		Symbol	10 S	Steady State	Unit
Drain-Source Voltage		$V_{DS}$	-20		V
Gate-Source Voltage		$V_{GS}$	$\pm 12$		
Continuous Drain Current <sup>a d</sup>	$T_A=25^\circ\text{C}$	$I_D$	-6.4	-5.7	A
	$T_A=70^\circ\text{C}$		-5.1	-4.6	
Maximum Power Dissipation <sup>a d</sup>	$T_A=25^\circ\text{C}$	$P_D$	1.5	1.2	W
	$T_A=70^\circ\text{C}$		1	0.8	
Continuous Drain Current <sup>b d</sup>	$T_A=25^\circ\text{C}$	$I_D$	-5.5	-4.8	A
	$T_A=70^\circ\text{C}$		-4.4	-3.9	
Maximum Power Dissipation <sup>b d</sup>	$T_A=25^\circ\text{C}$	$P_D$	1.1	0.8	W
	$T_A=70^\circ\text{C}$		0.7	0.5	
Pulsed Drain Current <sup>c</sup>		$I_{DM}$	-20		A
Operating Junction Temperature		$T_J$	-55 to 150		$^\circ\text{C}$
Lead Temperature		$T_L$	260		$^\circ\text{C}$
Storage Temperature Range		$T_{stg}$	-55 to 150		$^\circ\text{C}$

**Thermal resistance ratings**

Parameter		Symbol	Typical	Maximum	Unit
Junction-to-Ambient Thermal Resistance <sup>a</sup>	$t \leq 10 \text{ s}$	$R_{\theta JA}$	65	80	$^\circ\text{C/W}$
	Steady State		85	100	
Junction-to-Ambient Thermal Resistance <sup>b</sup>	$t \leq 10 \text{ s}$	$R_{\theta JA}$	90	110	
	Steady State		115	140	
Junction-to-Case Thermal Resistance	Steady State	$R_{\theta JC}$	40	60	

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

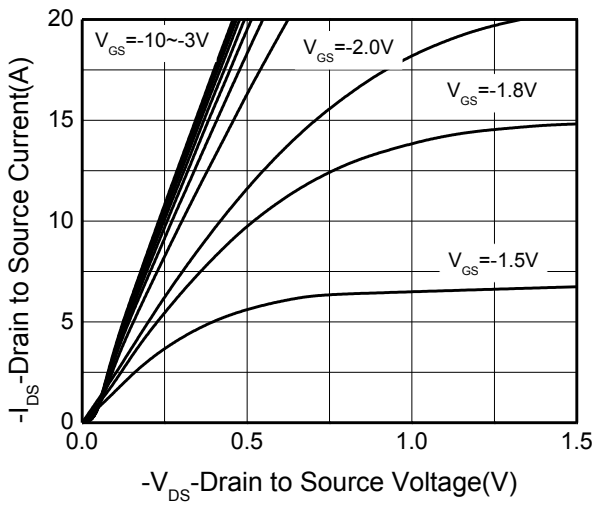
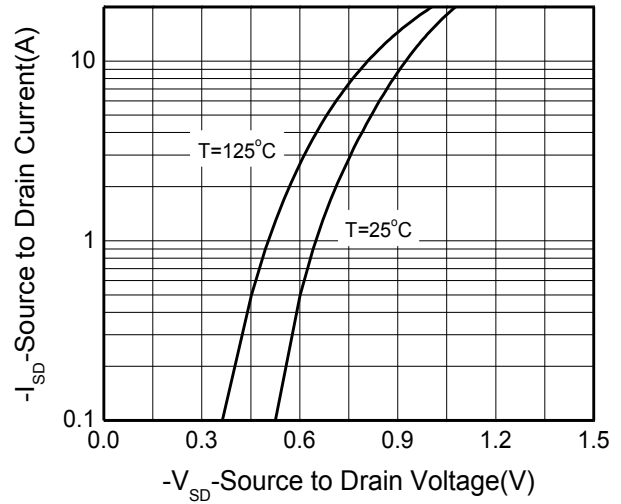
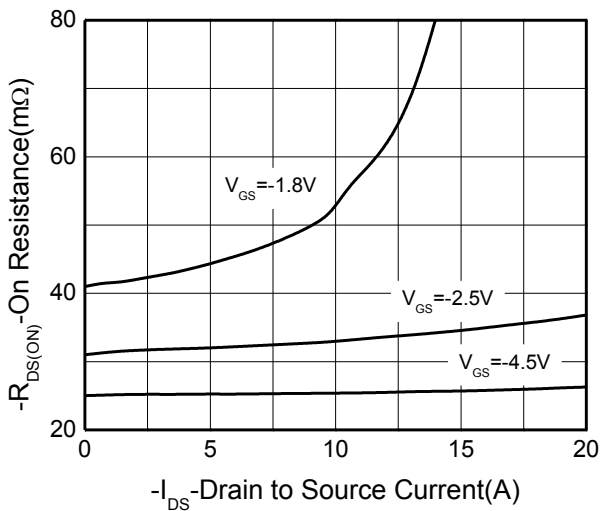
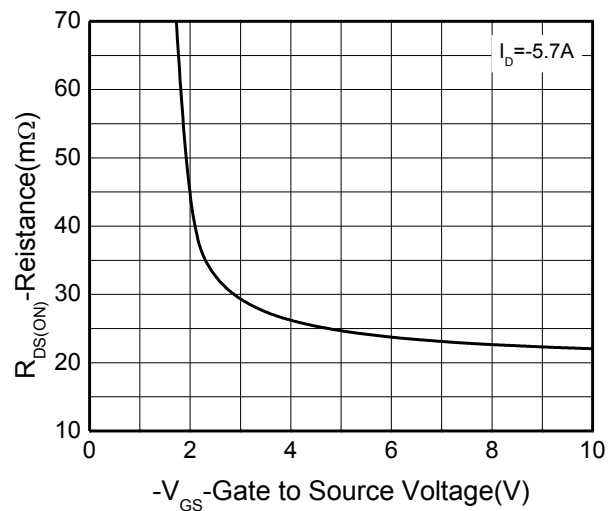
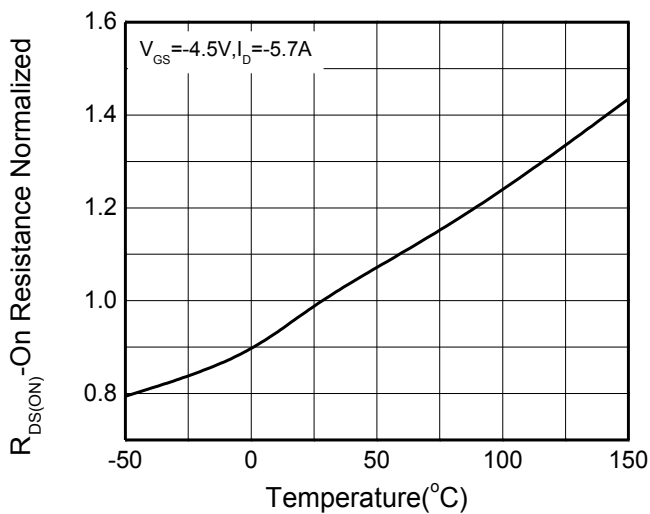
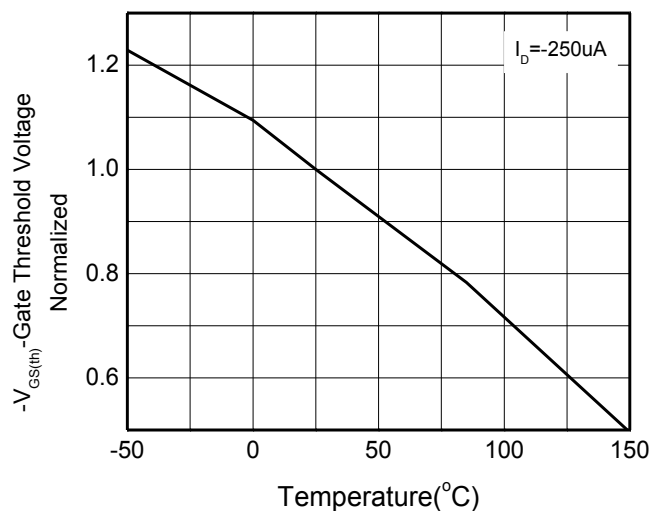
b Surface mounted on FR-4 board using minimum pad size, 1oz copper

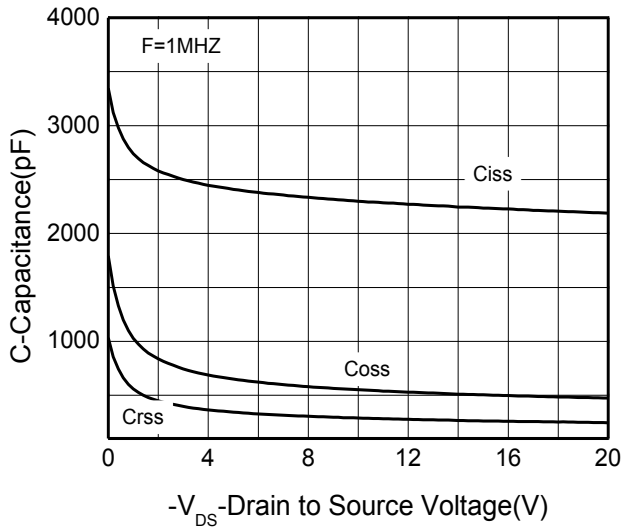
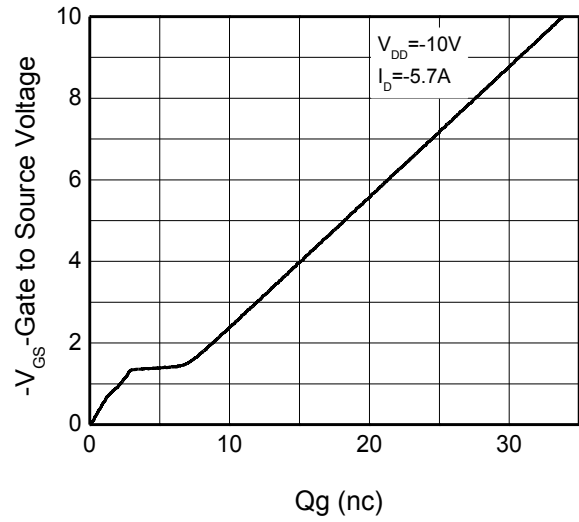
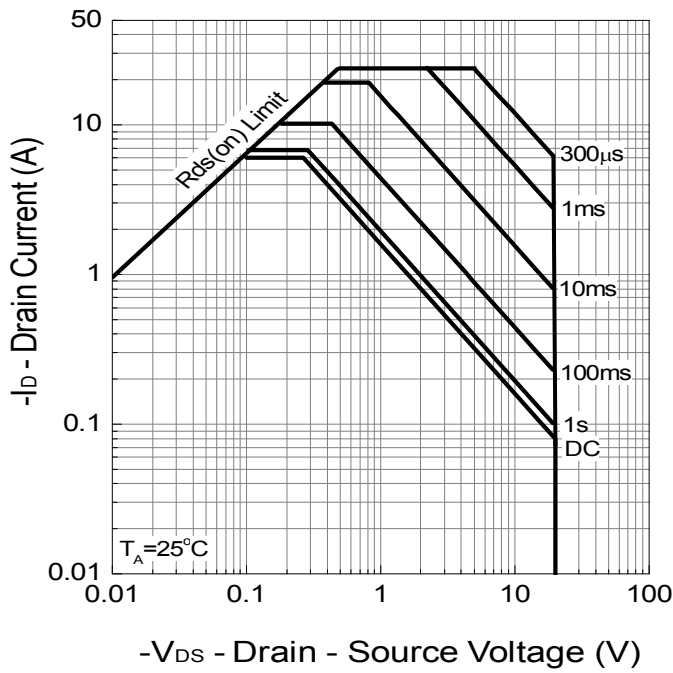
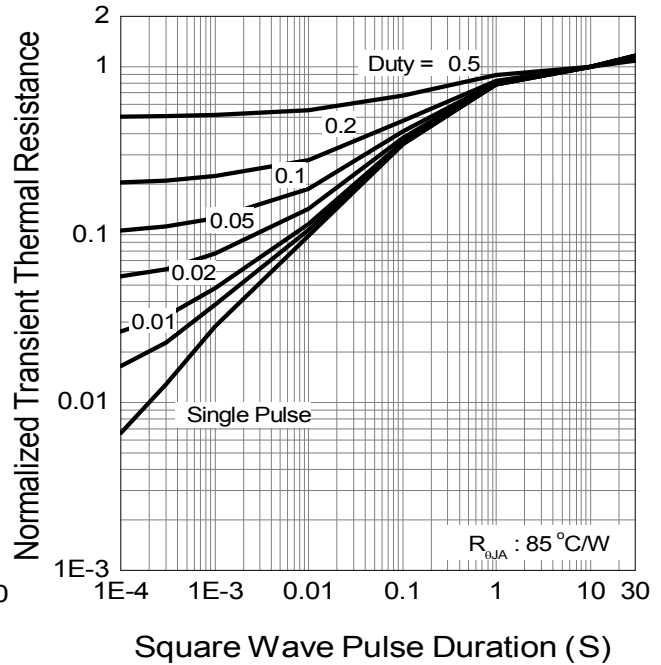
c Pulse width < 380 $\mu\text{s}$

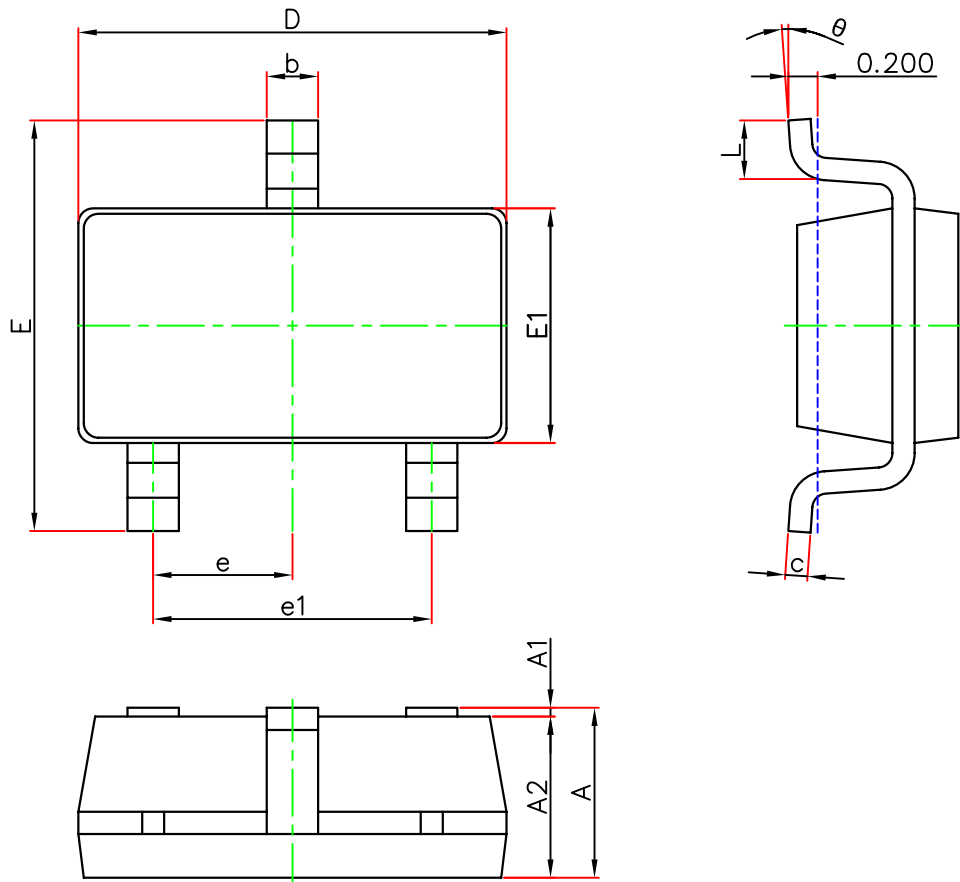
d Maximum junction temperature  $T_J=150^\circ\text{C}$ .

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
<b>OFF CHARACTERISTICS</b>						
Drain-to-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS} = 0\text{ V}, I_D = -250\mu\text{A}$	-20			V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = -16\text{V}, V_{GS} = 0\text{V}$			-1	$\mu\text{A}$
Gate-to-source Leakage Current	$I_{GSS}$	$V_{DS} = 0\text{ V}, V_{GS} = \pm 12\text{V}$			$\pm 100$	nA
<b>ON CHARACTERISTICS</b>						
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{GS} = V_{DS}, I_D = -250\mu\text{A}$	-0.4	-0.65	-1	V
Drain-to-source On-resistance <sup>c</sup>	$R_{DS(on)}$	$V_{GS} = -4.5\text{V}, I_D = -5.7\text{A}$		25	30	m $\Omega$
		$V_{GS} = -2.5\text{V}, I_D = -3.7\text{A}$		32	40	
		$V_{GS} = -1.8\text{V}, I_D = -2.0\text{A}$		42	60	
Forward Transconductance	$g_{FS}$	$V_{DS} = -10\text{V}, I_D = -1.0\text{A}$		6		S
<b>CAPACITANCES, CHARGES</b>						
Input Capacitance	$C_{ISS}$	$V_{GS} = 0\text{ V},$ $f = 1.0\text{ MHz},$ $V_{DD} = -10\text{ V}$		2260		pF
Output Capacitance	$C_{OSS}$			550		
Reverse Transfer Capacitance	$C_{RSS}$			270		
Total Gate Charge	$Q_{G(TOT)}$	$V_{GS} = -4.5\text{ V},$ $V_{DD} = -10\text{ V},$ $I_D = -5.7\text{A}$		16.6		nC
Threshold Gate Charge	$Q_{G(TH)}$			0.85		
Gate-to-Source Charge	$Q_{GS}$			2.6		
Gate-to-Drain Charge	$Q_{GD}$			3.9		
<b>SWITCHING CHARACTERISTICS</b>						
Turn-On Delay Time	$t_{d(on)}$	$V_{GS} = -4.5\text{ V},$ $V_{DD} = -10\text{V},$ $I_D = -1\text{A},$ $R_G = 6\ \Omega$		26		ns
Rise Time	$t_r$			18		
Turn-Off Delay Time	$t_{d(off)}$			122		
Fall Time	$t_f$			71		
<b>BODY DIODE CHARACTERISTICS</b>						
Forward Voltage	$V_{SD}$	$V_{GS} = 0\text{ V}, I_S = -2.0\text{A}$			-1.2	V

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

**Output characteristics**

**Body diode forward voltage**

**On-Resistance vs. Drain current**

**On-Resistance vs. Gate-to-Source voltage**

**On-Resistance vs. Junction temperature**

**Threshold voltage vs. Temperature**


**Capacitance**

**Gate charge Characteristics**

**Safe operating power**

**Transient thermal response  
(Junction-to-Ambient)**

**Package outline dimensions**
**SOT-23-3**


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°

制 修 订 记 录					
文件版本	制修日期	修订页次	修订人	变更内容	
V1.0	2015.06.08	All	杨乐	初版	
批准		审核		编制	
日期		日期		日期	
各部门会签					
应用部	封装部	市场部	生产管理部		
市场部上传者/上传时间					
品质部确认者/确认时间					