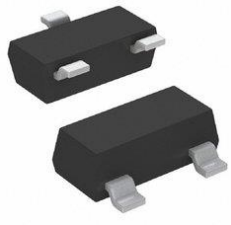
WPM6207

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

www.sh-willsemi.com

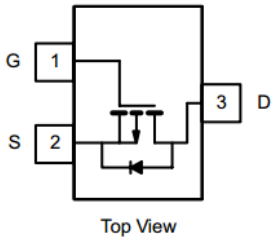
V_{DS} (V)	Max $R_{ds(on)}$ (mΩ)
-20	32@ V_{GS}= – 4.5V
	40@ V_{GS}= – 2.5V
	60@ V_{GS}= – 1.8V



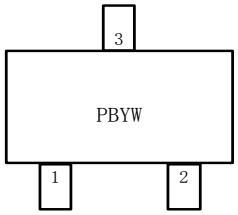
SOT-23-3

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.



Pin configuration (Top view)



PB= Specific Device Code
Y = Year
W= Week

Marking

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

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}	±12		
Continuous Drain Current [a d]	T_A=25°C	I_D	-6.4	-5.7	A
	T_A=70°C		-5.1	-4.6	
Maximum Power Dissipation [a d]	T_A=25°C	P_D	1.5	1.2	W
	T_A=70°C		1	0.8	
Continuous Drain Current [b d]	T_A=25°C	I_D	-5.5	-4.8	A
	T_A=70°C		-4.4	-3.9	
Maximum Power Dissipation [b d]	T_A=25°C	P_D	1.1	0.8	W
	T_A=70°C		0.7	0.5	
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

Parameter		Symbol	Typical	Maximum	Unit
Junction-to-Ambient Thermal Resistance [a]	t ≤ 10 s	$R_{\theta JA}$	65	80	°C/W
	Steady State		85	100	
Junction-to-Ambient Thermal Resistance [b]	t ≤ 10 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

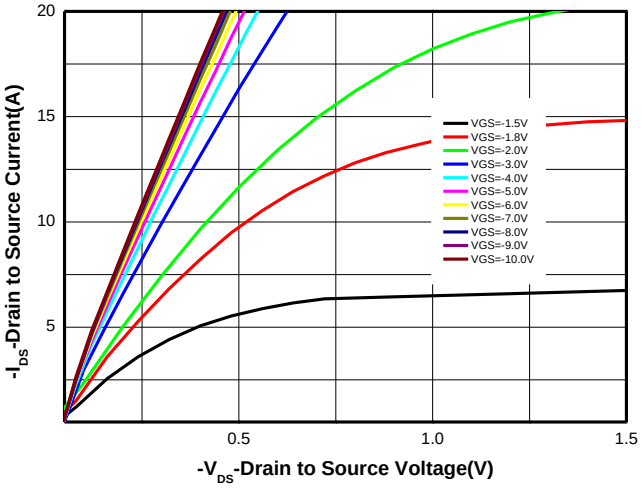
c Pulse width<380μs

d Maximum junction temperature T_J=150°C.

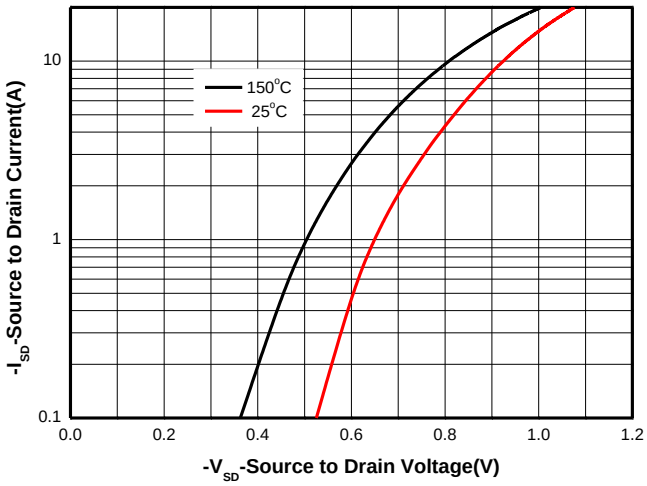
Electronics Characteristics (Ta=25°C, unless otherwise noted)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Drain-to-Source Breakdown Voltage	BV_{DSS}	V_{GS} = 0 V, I_D = -250uA	-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	-0.65	-1	V
Drain-to-source On-resistance [c]	$R_{DS(on)}$	V_{GS} = -4.5V, I_D = -5.7A		25	32	mΩ
		V_{GS} = -2.5V, I_D = -3.7A		32	40	
		V_{GS} = -1.8V, I_D = -2.0A		42	60	
Forward Transconductance	g_{FS}	V_{DS}=-10V, I_D=-1.0A		6		S
CAPACITANCES, CHARGES						
Input Capacitance	C_{ISS}	V_{GS} = 0 V, f = 1.0 MHz, V_{DD} = -10 V		1702		pF
Output Capacitance	C_{OSS}			177		
Reverse Transfer Capacitance	C_{RSS}			152		
Total Gate Charge	$Q_{G(TOT)}$	V_{GS} = -4.5 V, V_{DD} = -10 V, I_D = -4.9A		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		
SWITCHING CHARACTERISTICS						
Turn-On Delay Time	td(on)	V_{GS} = -4.5 V, V_{DD} = -10V, I_D=-1A, R_G=6 Ω		12.6		ns
Rise Time	tr			11.4		
Turn-Off Delay Time	td(off)			122		
Fall Time	tf			44		
BODY DIODE CHARACTERISTICS						
Forward Voltage	V_{SD}	V_{GS} = 0 V, I_S = −2.0A			-1.2	V

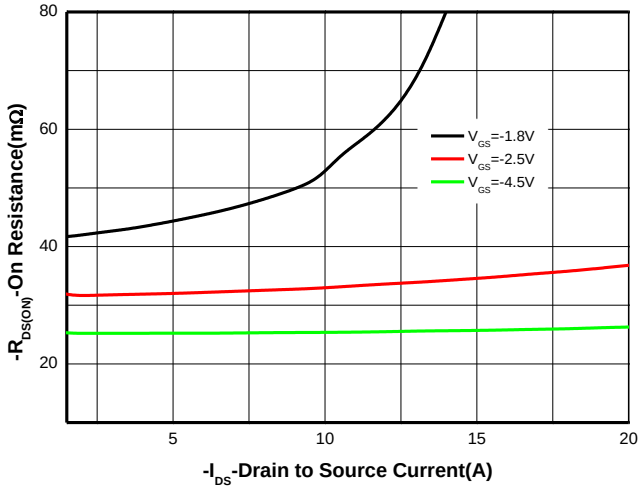
Typical Characteristics (Ta=25°C, unless otherwise noted)



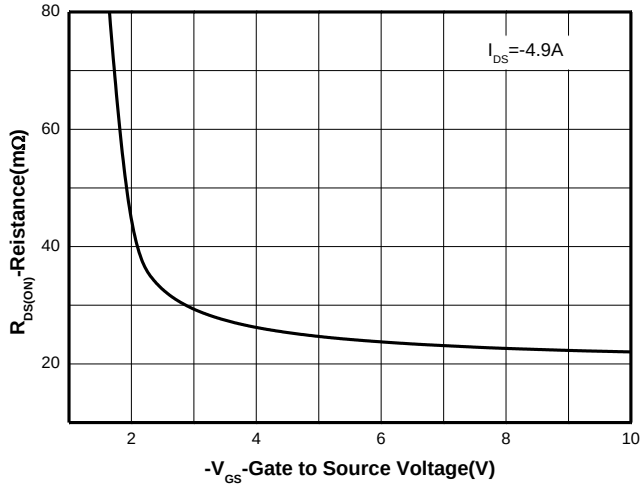
Output characteristics



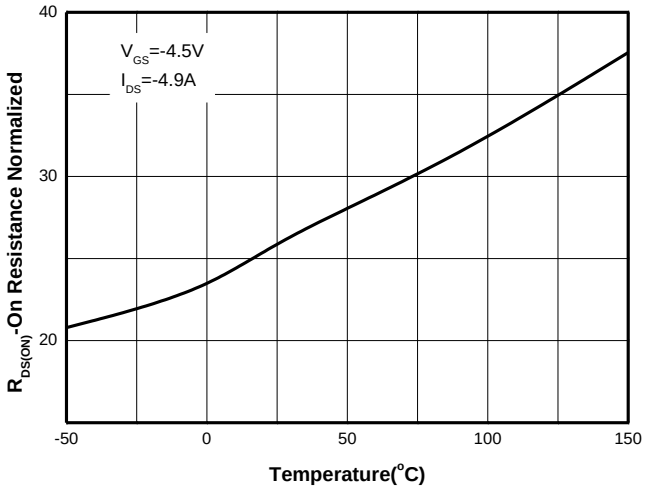
Body diode forward voltage



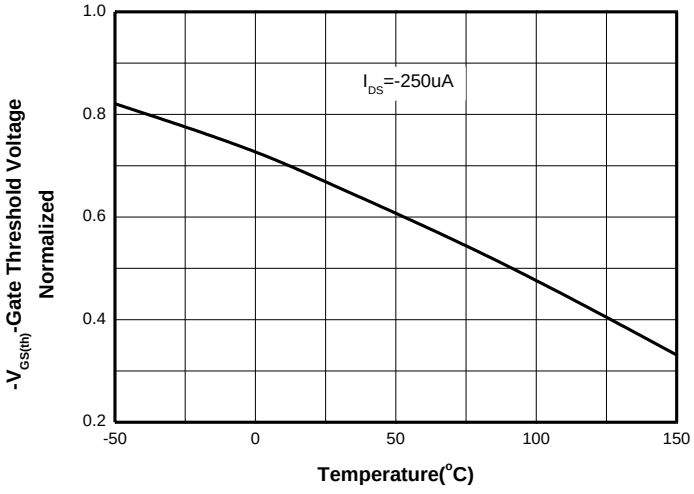
On-Resistance vs. Drain current



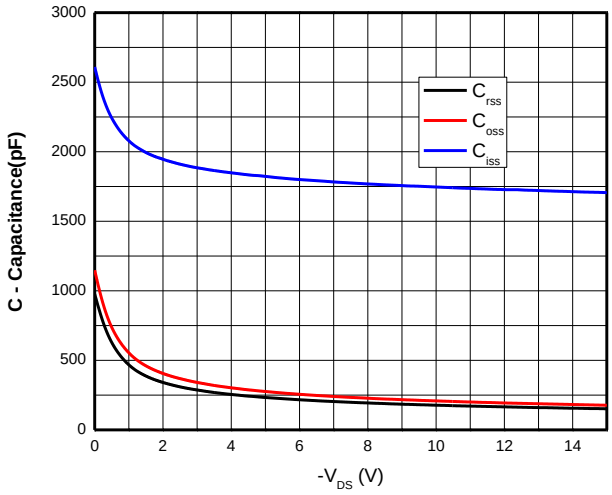
On-Resistance vs. Gate-to-Source voltage



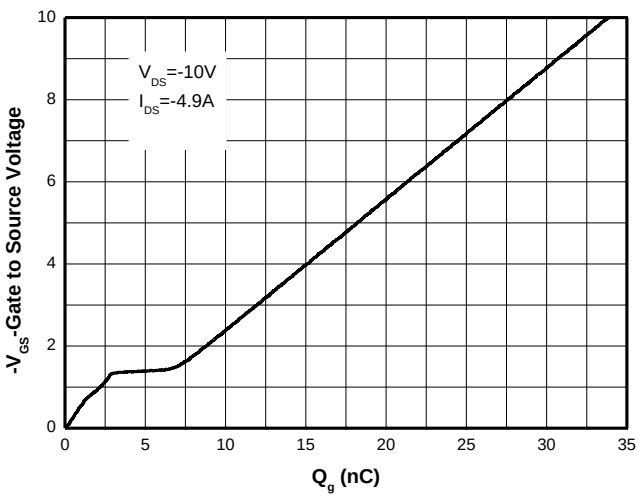
On-Resistance vs. Junction temperature



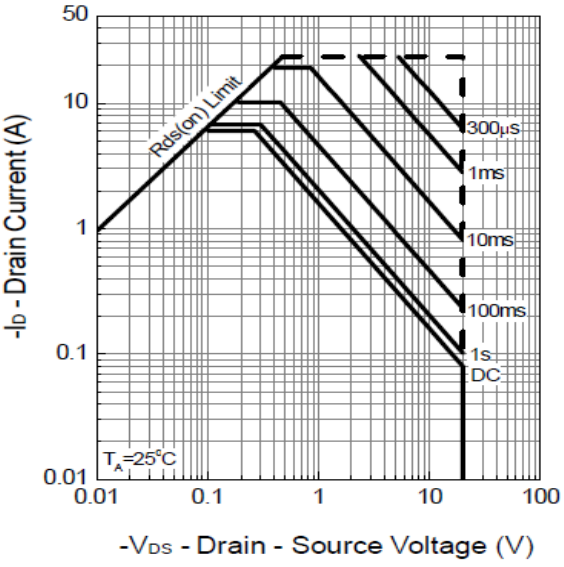
Threshold voltage vs. Temperature



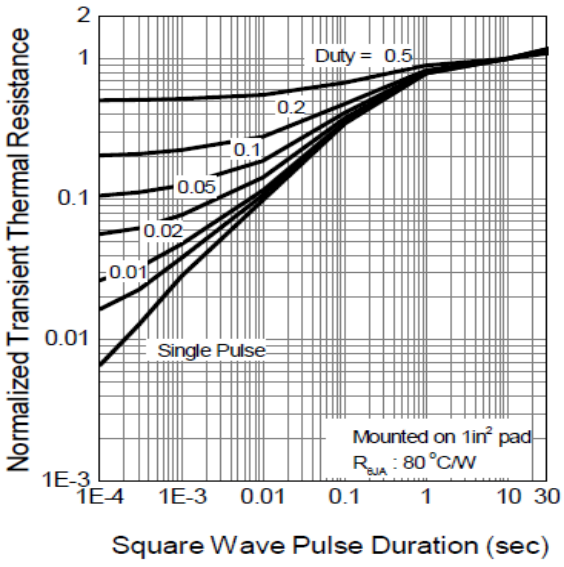
Capacitance



Gate charge Characteristics



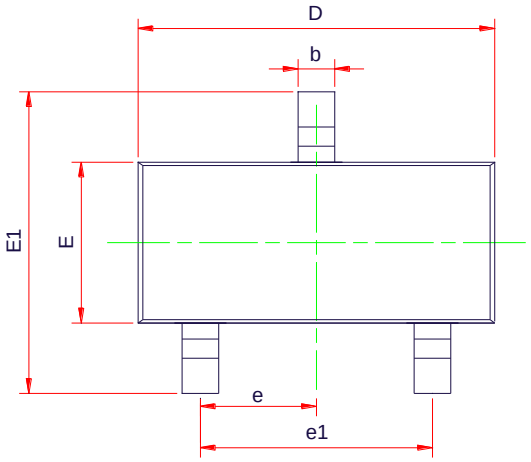
Safe operating power



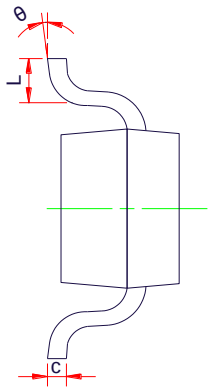
Transient thermal response (Junction-to-Ambient)

PACKAGE OUTLINE DIMENSIONS

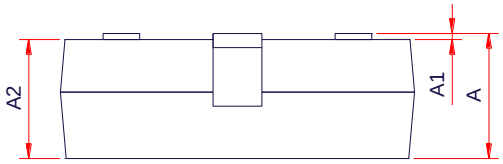
SOT-23-3L



TOP VIEW



SIDE VIEW

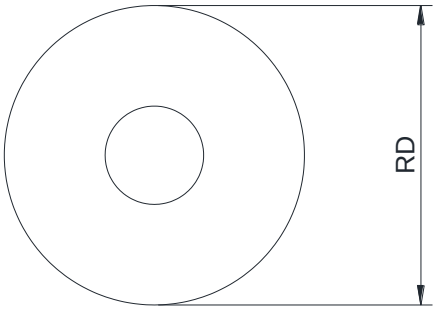


SIDE VIEW

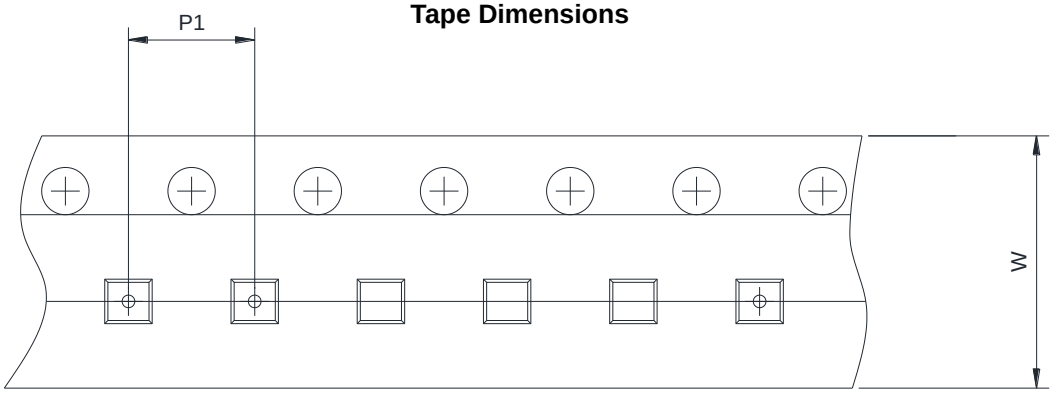
Symbol	Dimensions in Millimeters		
	Min.	Typ.	Max.
A	-	-	1.25
A1	0.00	-	0.15
A2	1.00	1.10	1.20
b	0.30	0.40	0.50
c	0.10	-	0.20
D	2.82	2.92	3.03
E1	2.60	2.80	3.00
E	1.50	1.62	1.73
e	0.95 BSC		
e1	1.80	1.90	2.00
L	0.30	0.45	0.60
θ	0°	-	8°

TAPE AND REEL INFORMATION

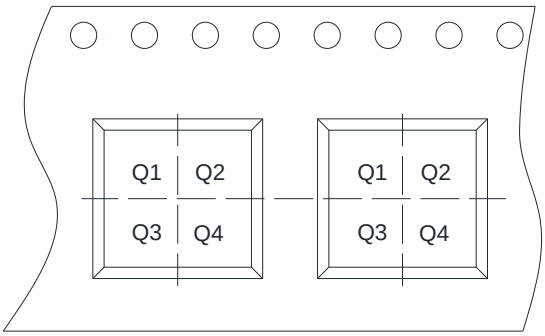
Reel Dimensions



Tape Dimensions



Quadrant Assignments For PIN1 Orientation In Tape



User Direction of Feed

RD	Reel Dimension	☑ 7inch	☐ 13inch		
W	Overall width of the carrier tape	☑ 8mm	☐ 12mm	☐ 16mm	
P1	Pitch between successive cavity centers	☐ 2mm	☑ 4mm	☐ 8mm	
Pin1	Pin1 Quadrant	☐ Q1	☐ Q2	☑ Q3	☐ Q4