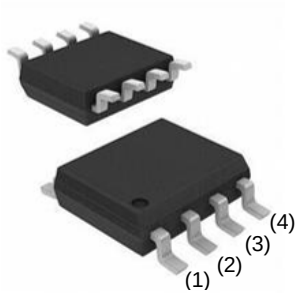
WPM3021

Single P-Channel, -30V, -13A, Power MOSFET **Http://www.sh-willsemi.com**

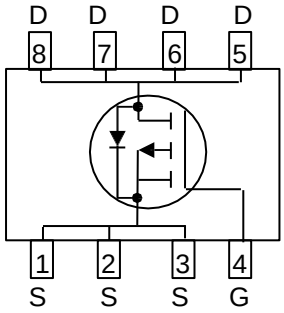
V_{DS} (V)	Typical $R_{DS(on)}$ (mΩ)
-30	11@ V_{GS}=-10V
	15 @ V_{GS}=-5V



SOP-8L

Descriptions

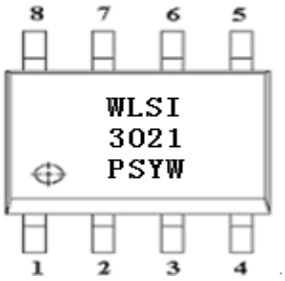
The WPM3021 is P-Channel enhancement MOS Field Effect Transistor. Uses advanced trench technology and design to provide excellent $R_{DS(ON)}$ with low gate charge. This device is suitable for use in DC-DC conversion, power switch and charging circuit. Standard Product WPM3021 is Pb-free.



Pin configuration (Top view)

Features

- Trench Technology
- Supper high density cell design
- Excellent ON resistance
- Extremely Low Threshold Voltage
- Small package SOP-8L



PE = 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
WPM3021-8/TR	SOP-8L	4000/Tape&Reel

Absolute Maximum ratings

Parameter		Symbol	Maximum	Unit
Drain-Source Voltage		V_{DS}	-30	V
Gate-Source Voltage		V_{GS}	±25	
Continuous Drain Current	T_A=25°C	I_D	-13	A
	T_A=70°C		-10	
Pulsed Drain Current [c]		I_{DM}	-72	
Maximum Power Dissipation [b]	T_A=25°C	P_D	3.8	W
	T_A=70°C		2.4	
Operating Junction Temperature		T_J	-55 to 150	°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	$R_{\theta JA}$	25	33	°C/W
	Steady State		50	63	
Junction-to-Lead Thermal Resistance	Steady State	$R_{\theta JL}$	10	13	

Note:

a. The value of $R_{\theta JA}$ is measured with the device mounted on 1-inch^2 (6.45cm^2) with 2oz.(0.071mm thick) Copper pad on a 1.5*1.5 inch^2, 0.06-inch thick FR4 PCB, in a still air environment with T_A =25°C. The value in any given application is determined by the user's specific board design

b. The power dissipation P_D is based on Junction-to-Ambient thermal resistance $R_{\theta JA}$ t≤10s value and the $T_{J(MAX)}$=150°C.

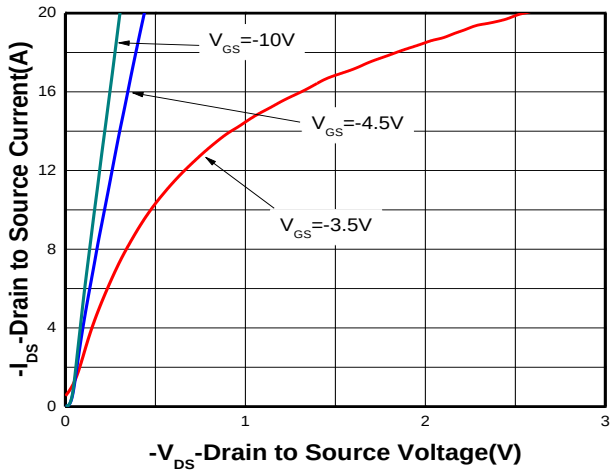
c. Repetitive rating, ~10us pulse width, duty cycle ~1%, keep initial T_J =25°C, the maximum allowed junction temperature of 150°C.

d. The static characteristics are obtained using ~380us pulses, duty cycle ~1%.

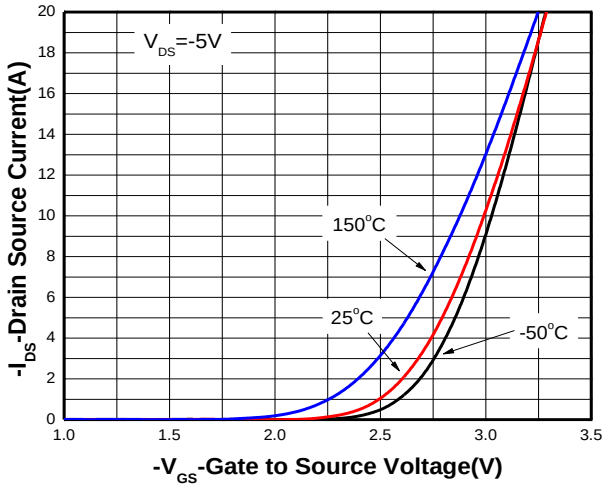
Electronics Characteristics (Ta=25°C, unless otherwise noted)

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} =-24V, V_{GS} = 0V			-1	uA
Gate-to-source Leakage Current	I_{GSS}	V_{DS} = 0 V, V_{GS} = ±25V			±100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	V_{GS} = V_{DS}, I_D = -250uA	-1.0	-1.8	-3.0	V
Drain-to-source On-resistance	$R_{DS(on)}$	V_{GS} = -10V, I_D = -13A		11	15	mΩ
		V_{GS} =-5V, I_D = -7A		15	20	
Forward Transconductance	g_{FS}	V_{DS} = -5 V, I_D = -8A		7	16	S
CHARGES, CAPACITANCES AND GATE RESISTANCE						
Input Capacitance	C_{ISS}	V_{GS} = 0 V, f = 1.0MHz, V_{DS} = -15 V		2106		pF
Output Capacitance	C_{OSS}			353		
Reverse Transfer Capacitance	C_{RSS}			274		
Total Gate Charge	$Q_{G(TOT)}$	V_{GS} = -10 V, V_{DS} = -15 V, I_D =-13 A		38		nC
Threshold Gate Charge	$Q_{G(TH)}$			4		
Gate-to-Source Charge	Q_{GS}			7.7		
Gate-to-Drain Charge	Q_{GD}			6.5		
SWITCHING CHARACTERISTICS						
Turn-On Delay Time	td(ON)	V_{GS} = -10 V, V_{DS} =-15 V, I_D=-5A, R_G=6Ω		18		ns
Rise Time	tr			24		
Turn-Off Delay Time	td(OFF)			114		
Fall Time	tf			47		
BODY DIODE CHARACTERISTICS						
Forward Voltage	V_{SD}	V_{GS} = 0 V, I_S = -1A	-0.5	-0.8	-1.2	V

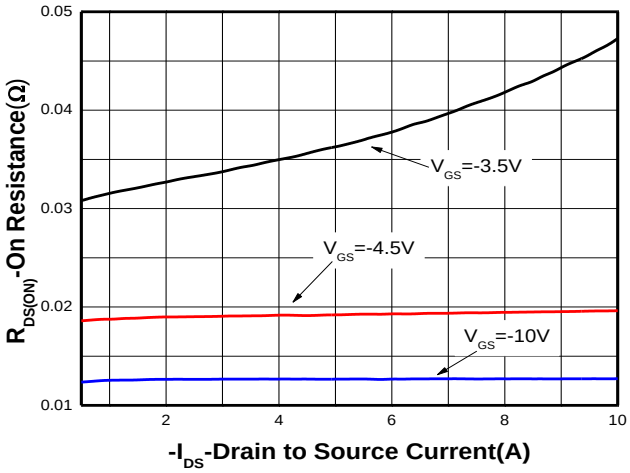
Typical Characteristics (Ta=25°C, unless otherwise noted)



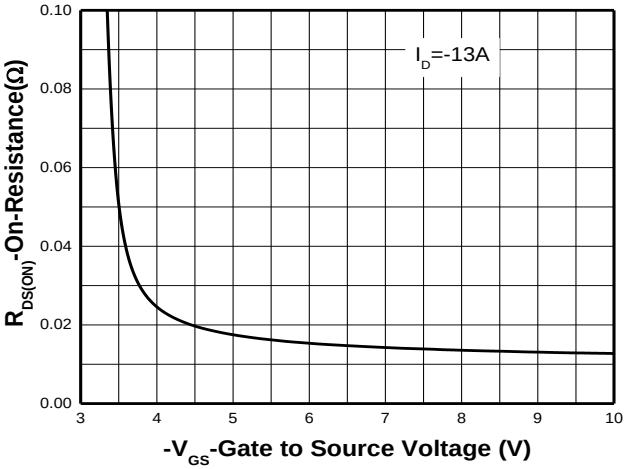
Output characteristics



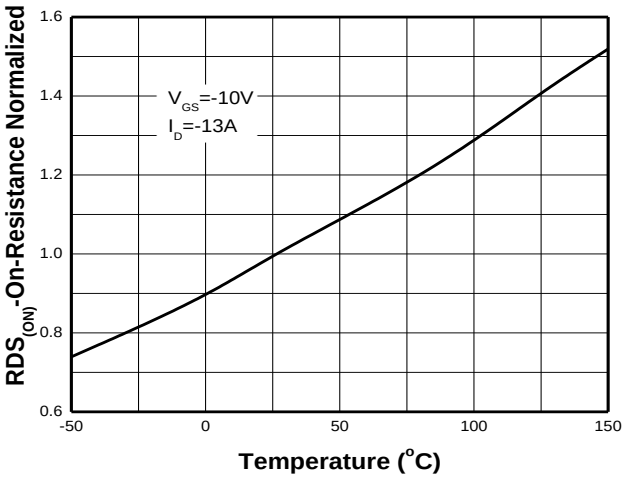
Transfer characteristics



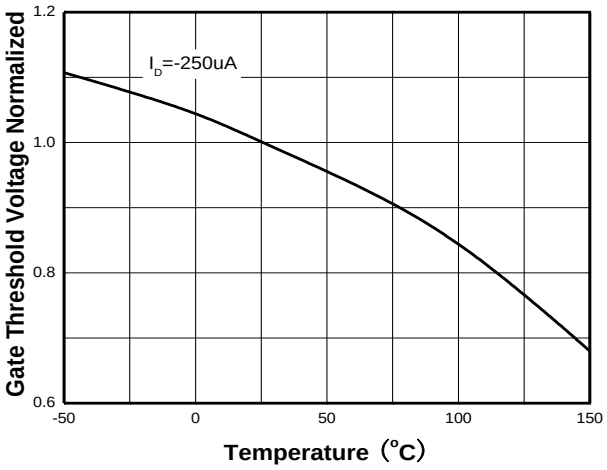
On-Resistance vs. Drain current



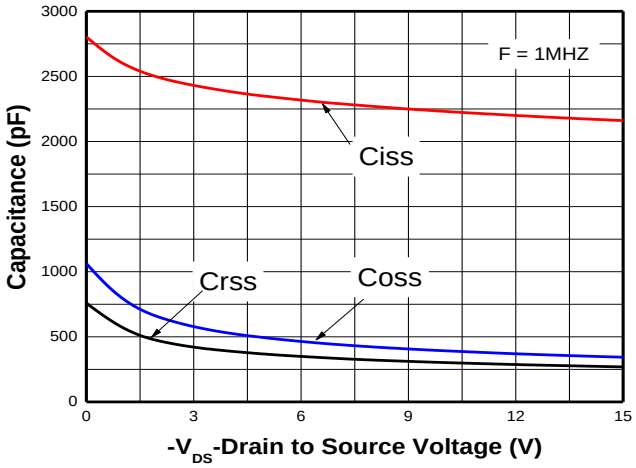
On-Resistance vs. Gate-to-source voltage



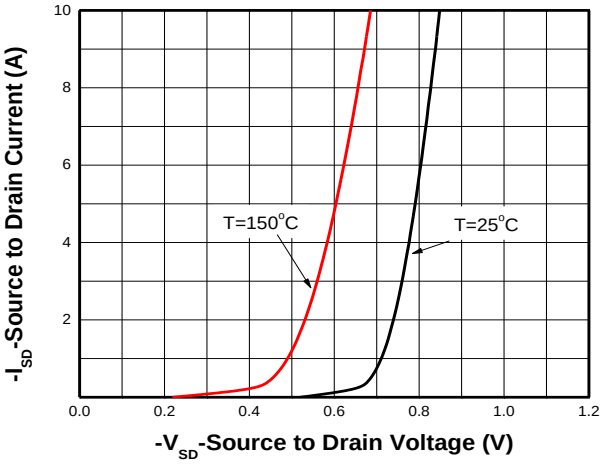
On-Resistance vs. Junction temperature



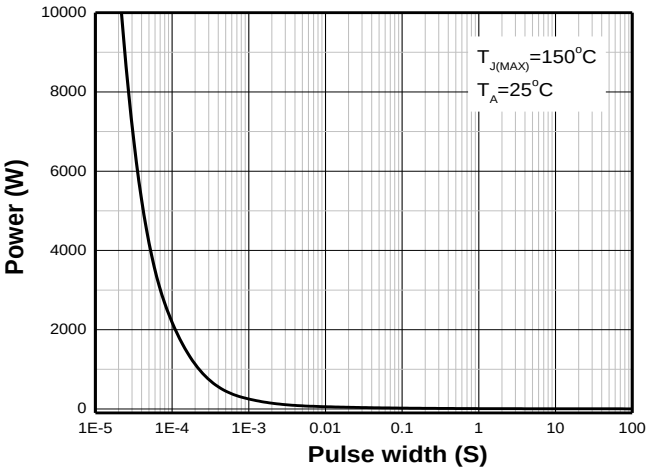
Threshold voltage vs. Temperature



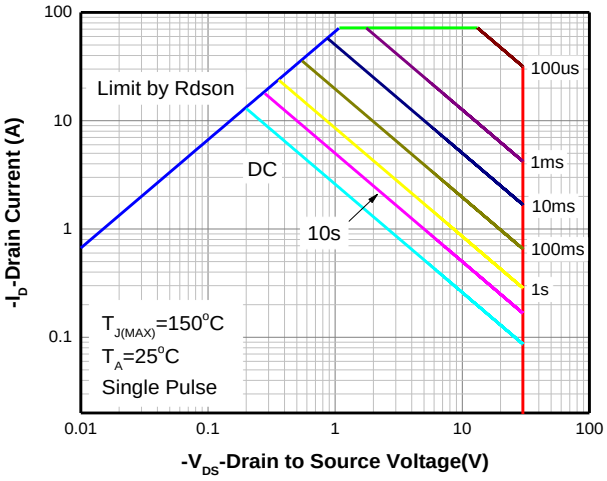
Capacitance



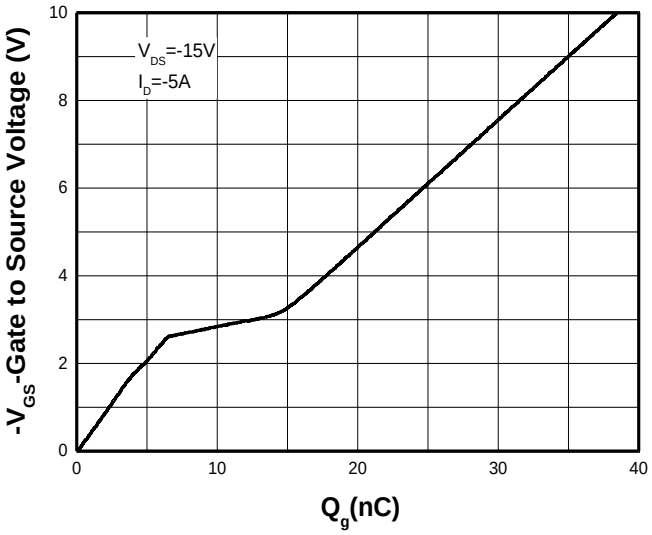
Body diode forward voltage



Single pulse power

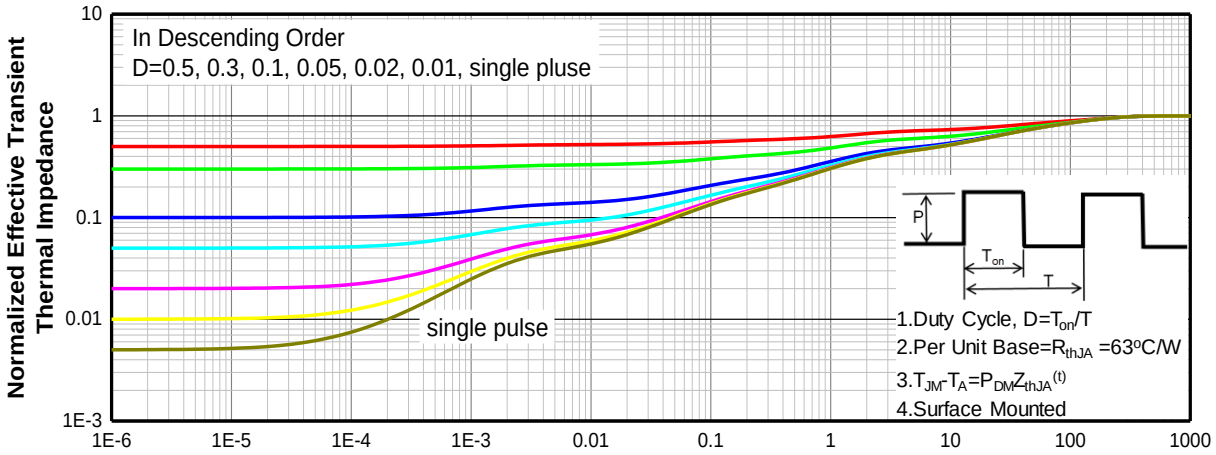


Safe operating power



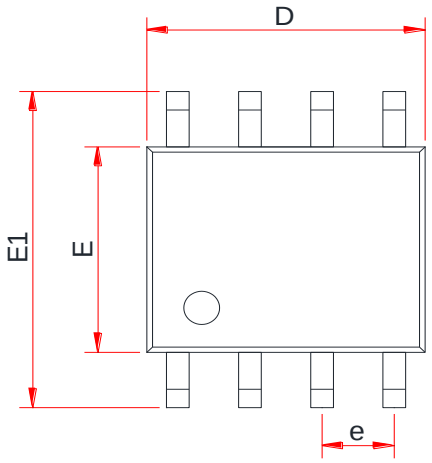
Gate Charge Characteristics

Transient Thermal Response (Junction-to-Ambient)

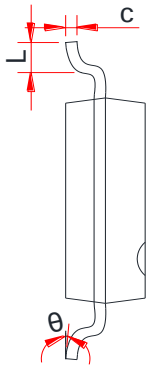


Package outline dimensions

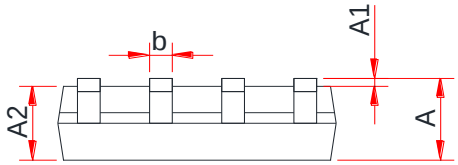
SOP-8L



TOP VIEW



SIDE VIEW

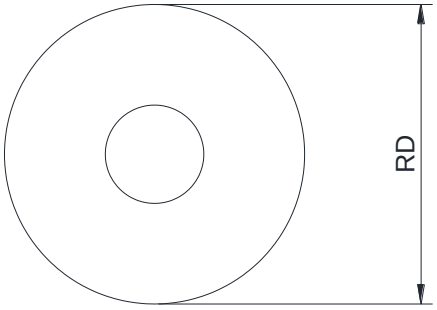


SIDE VIEW

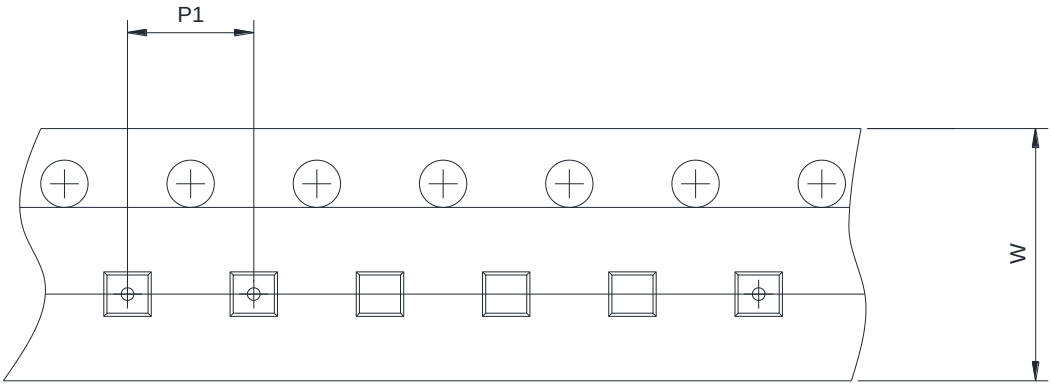
Symbol	Dimensions In Millimeters (mm)		
	Min.	Typ.	Max.
A	1.35	1.55	1.75
A1	0.05	0.15	0.25
A2	1.25	1.40	1.65
b	0.33	-	0.51
c	0.15	-	0.26
D	4.70	4.90	5.10
E	3.70	3.90	4.10
E1	5.80	6.00	6.20
e	1.27BSC		
L	0.40	-	1.27
θ	0°	-	8°

Tape and reel information

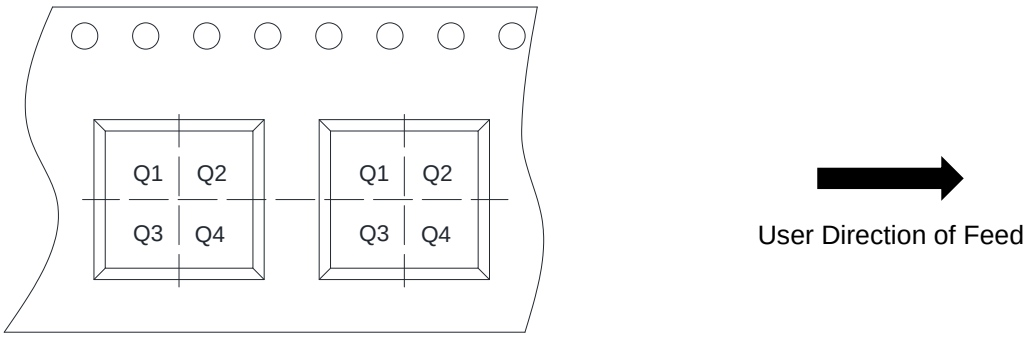
Reel Dimensions



Tape Dimensions



Quadrant Assignments For PIN1 Orientation In Tape



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