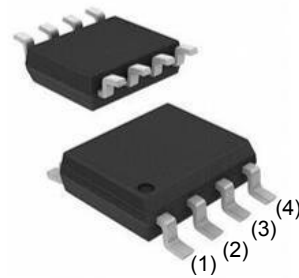
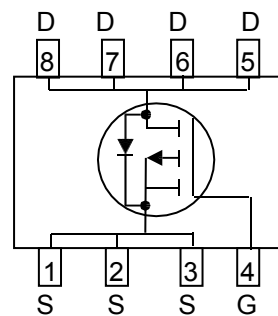


WPM3021A

Single P-Channel, -30V, -13.5A, Power MOSFET

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

V _{DS} (V)	Typical R _{DS(on)} (mΩ)
-30	9.0 @ V _{GS} =-10V
	11.0 @ V _{GS} =-6V
	14.5 @ V _{GS} =-4.5V


SOP-8L

Pin configuration (Top view)


WLSI = Company Code
 3021A = Device Code
 PS = Special Code
 Y = Year
 W = Week(A~z)

Marking
Order information

Device	Package	Shipping
WPM3021A-8/TR	SOP-8L	4000/Tape&Reel

Descriptions

The WPM3021A 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 WPM3021A is Pb-free.

Features

- Trench Technology
- Supper high density cell design
- Excellent ON resistance

Applications

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

Absolute Maximum ratings

Parameter	Symbol	Maximum	Unit	
Drain-Source Voltage	V_{DS}	-30	V	
Gate-Source Voltage	V_{GS}	± 25		
Continuous Drain Current	I_D	$T_A=25^\circ\text{C}$	-13.5	A
		$T_A=70^\circ\text{C}$	-10.8	
Pulsed Drain Current ^c	I_{DM}	-90		
Maximum Power Dissipation ^b	P_D	$T_A=25^\circ\text{C}$	3.1	W
		$T_A=70^\circ\text{C}$	2.0	
Operating Junction Temperature	T_J	-55 to 150	$^\circ\text{C}$	
Storage Temperature Range	T_{STG}	-55 to 150	$^\circ\text{C}$	

Thermal resistance ratings

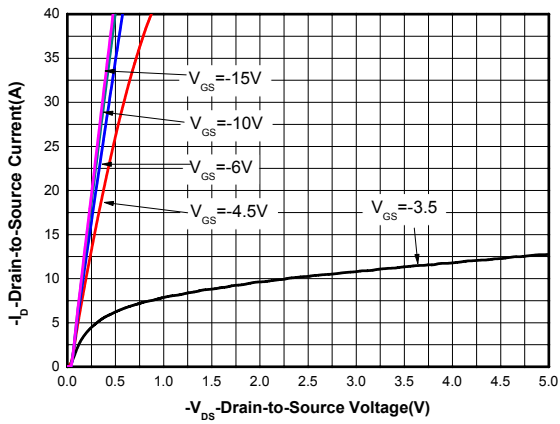
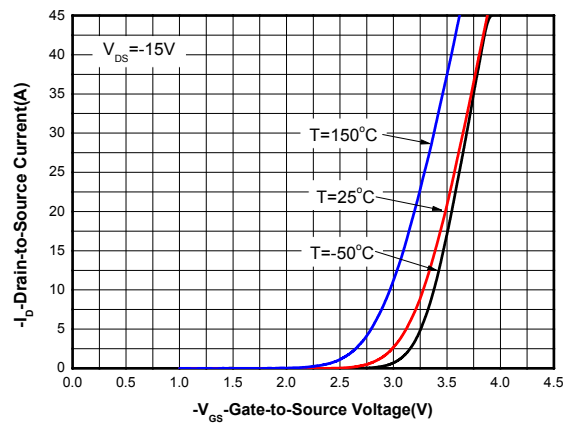
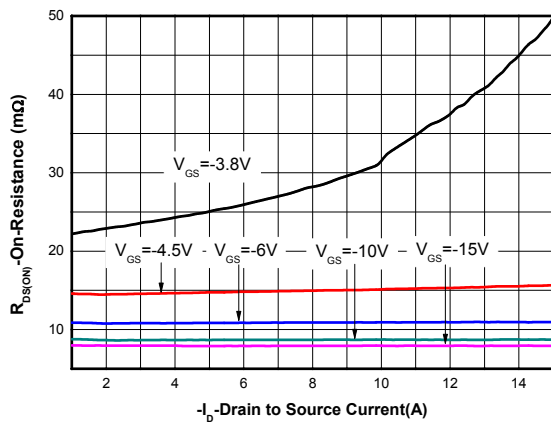
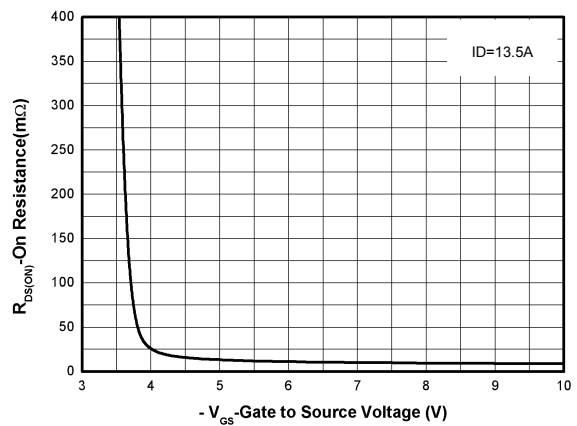
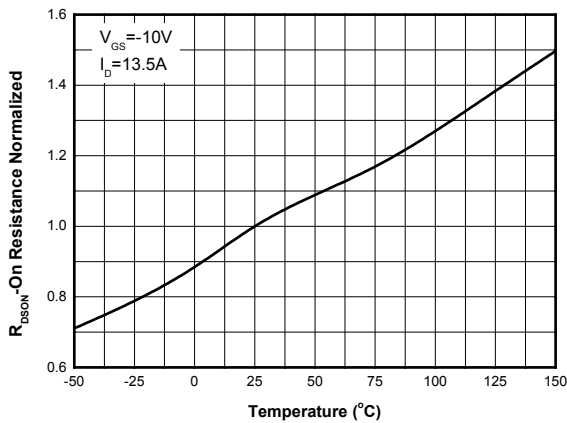
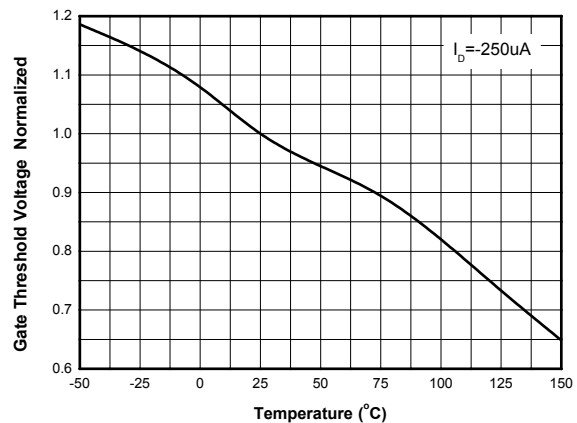
Single Operation					
Parameter		Symbol	Typical	Maximum	Unit
Junction-to-Ambient Thermal Resistance ^a	$t \leq 10\text{ s}$	$R_{\theta JA}$	32	40	$^\circ\text{C/W}$
	Steady State		57	71	
Junction-to-Lead Thermal Resistance	Steady State	$R_{\theta JL}$	18	22.5	

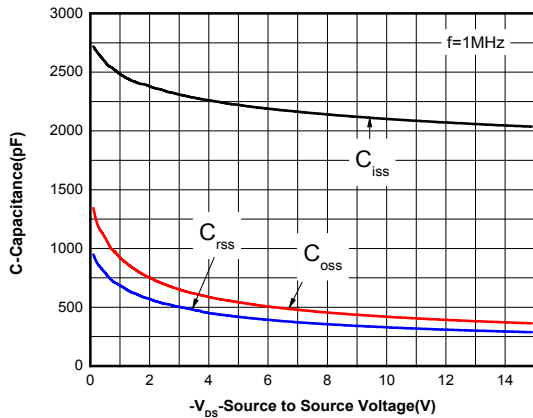
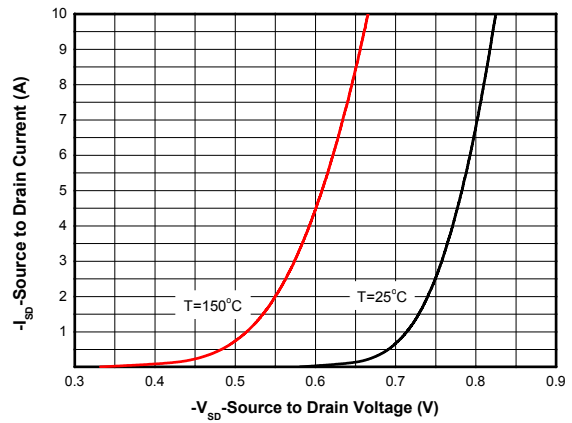
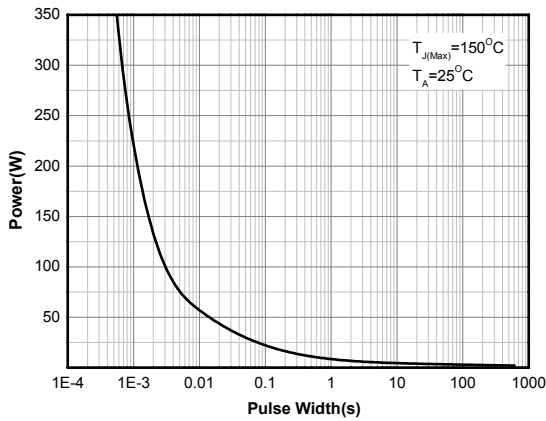
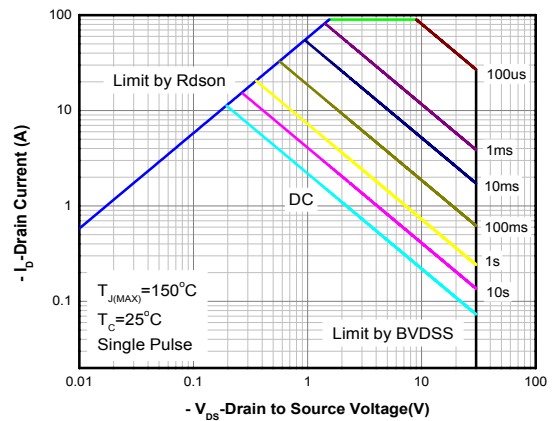
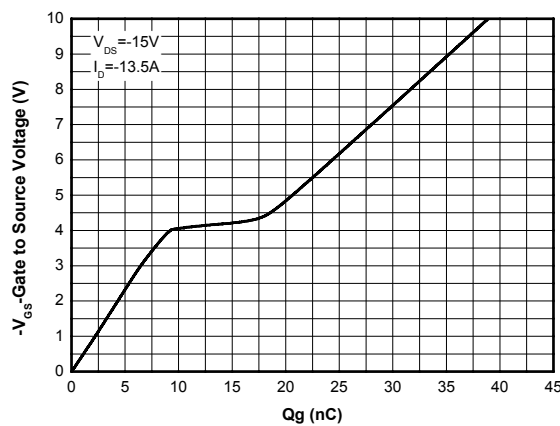
Note:

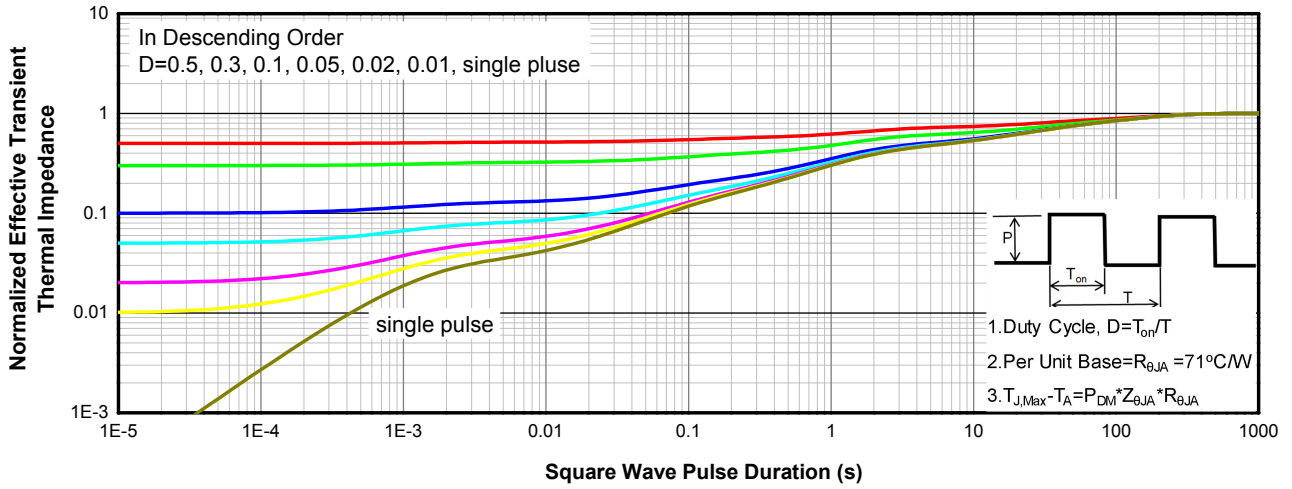
- The value of $R_{\theta JA}$ is measured with the device mounted on 1-inch² (6.45cm²) with 2oz.(0.071mm thick) Copper pad on a 1.5*1.5 inch², 0.06-inch thick FR4 PCB, in a still air environment with $T_A = 25^\circ\text{C}$. The value in any given application is determined by the user's specific board design
- The power dissipation P_D is based on Junction-to-Ambient thermal resistance $R_{\theta JA}$ $t \leq 10\text{s}$ value and the $T_{J(MAX)}=150^\circ\text{C}$.
- Repetitive rating, ~10us pulse width, duty cycle ~1%, keep initial $T_J = 25^\circ\text{C}$, the maximum allowed junction temperature of 150 $^\circ\text{C}$.
- The static characteristics are obtained using ~380us pulses, duty cycle ~1%.

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

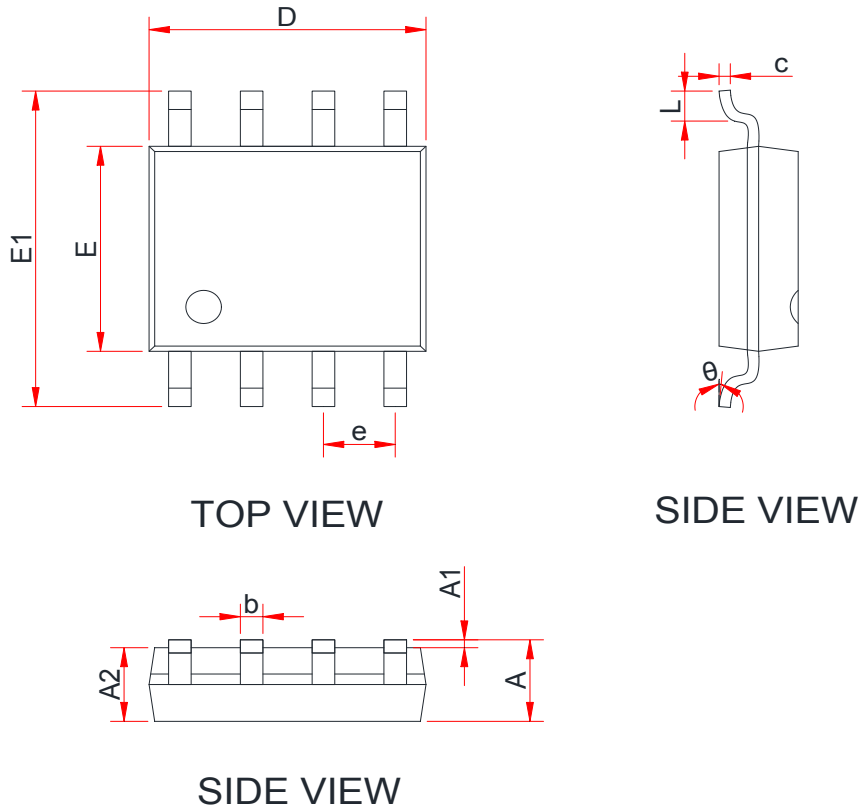
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Drain-to-Source Breakdown Voltage	BV_{DSS}	$V_{GS} = 0\text{ V}, I_D = -250\mu\text{A}$	-30			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = -24\text{ V}, V_{GS} = 0\text{ V}$			-1	μA
Gate-to-source Leakage Current	I_{GSS}	$V_{DS} = 0\text{ V}, V_{GS} = \pm 25\text{ V}$			± 100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{GS} = V_{DS}, I_D = -250\mu\text{A}$	-1.0	-2.1	-3.0	V
Drain-to-source On-resistance	$R_{DS(on)}$	$V_{GS} = -10\text{ V}, I_D = -13.5\text{ A}$		9.0	11.5	m Ω
		$V_{GS} = -6\text{ V}, I_D = -10\text{ A}$		11.0	16.0	
		$V_{GS} = -4.5\text{ V}, I_D = -8\text{ A}$		14.5	21.3	
CHARGES, CAPACITANCES AND GATE RESISTANCE						
Input Capacitance	C_{ISS}	$V_{GS} = 0\text{ V}, f = 1.0\text{ MHz}, V_{DS} = -15\text{ V}$		2040		pF
Output Capacitance	C_{OSS}			355		
Reverse Transfer Capacitance	C_{RSS}			280		
Total Gate Charge	$Q_{G(TOT)}$	$V_{GS} = -10\text{ V}, V_{DS} = -15\text{ V}, I_D = -13.5\text{ A}$		42		nC
Threshold Gate Charge	$Q_{G(TH)}$			4		
Gate-to-Source Charge	Q_{GS}			8.5		
Gate-to-Drain Charge	Q_{GD}			10		
SWITCHING CHARACTERISTICS						
Turn-On Delay Time	$t_d(ON)$	$V_{GS} = -10\text{ V}, V_{DS} = -15\text{ V}, I_D = -13.5\text{ A}, R_G = 6\Omega$		14		ns
Rise Time	t_r			21		
Turn-Off Delay Time	$t_d(OFF)$			54		
Fall Time	t_f			32		
BODY DIODE CHARACTERISTICS						
Forward Voltage	V_{SD}	$V_{GS} = 0\text{ V}, I_S = -1\text{ A}$			-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

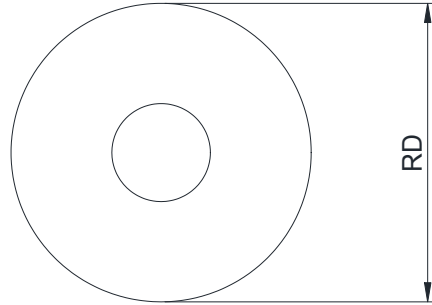
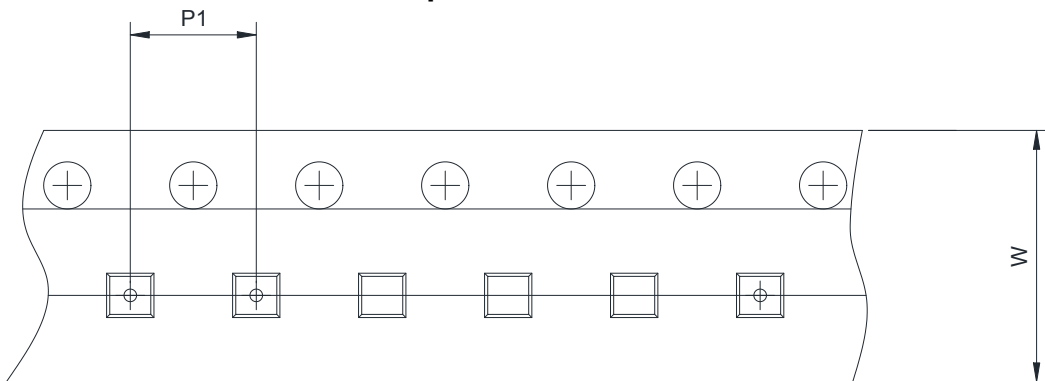
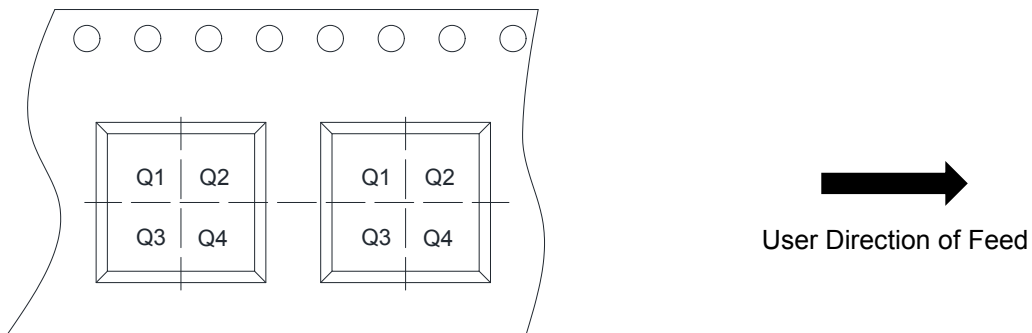

Capacitance

Body diode forward voltage

Single pulse power

Safe operating power

Gate Charge Characteristics



Transient Thermal Response (Junction-to-Ambient)

Package outline dimensions
SOP-8L


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	<input type="checkbox"/> 7inch	<input checked="" type="checkbox"/> 13inch		
W	Overall width of the carrier tape	<input type="checkbox"/> 8mm	<input checked="" type="checkbox"/> 12mm		
P1	Pitch between successive cavity centers	<input type="checkbox"/> 2mm	<input type="checkbox"/> 4mm	<input checked="" type="checkbox"/> 8mm	
Pin1	Pin1 Quadrant	<input checked="" type="checkbox"/> Q1	<input type="checkbox"/> Q2	<input type="checkbox"/> Q3	<input type="checkbox"/> Q4