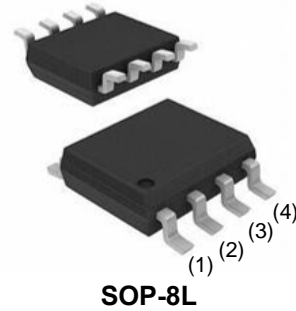
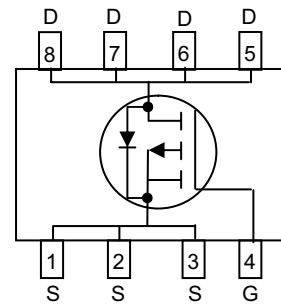


WPM9435A
[Http://www.sh-willsemi.com](http://www.sh-willsemi.com)
Single P-Channel, -30V, -6.3A, Power MOSFET

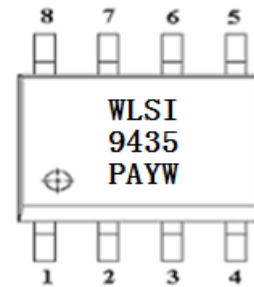
V_{DS} (V)	Typical $R_{DS(on)}$ (m Ω)
-30	33 @ $V_{GS}=-10V$
	43 @ $V_{GS}=-4.5V$


Descriptions

The WPM9435A 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 WPM9435A is Pb-free.


Pin configuration (Top view)
Features

- Trench Technology
- Supper high density cell design
- Excellent ON resistance
- Extremely Low Threshold Voltage



9435 = Device Code
 PA = Special Code
 YW = Year&Week

Marking
Applications

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

Order information

Device	Package	Shipping
WPM9435A-8/TR	SOP-8L	2500/Tape&Reel

Absolute Maximum ratings

Parameter	Symbol	10 s	Steady State	Unit	
Drain-Source Voltage	V_{DS}	-30		V	
Gate-Source Voltage	V_{GS}	±20			
Continuous Drain Current ^{a d}	I_D	$T_A=25^{\circ}C$	-6.3	-5.0	A
		$T_A=70^{\circ}C$	-5.1	-4.0	
Maximum Power Dissipation ^{a d}	P_D	$T_A=25^{\circ}C$	2.7	1.7	W
		$T_A=70^{\circ}C$	1.7	1.1	
Continuous Drain Current ^{b d}	I_D	$T_A=25^{\circ}C$	-5.5	-4.4	A
		$T_A=70^{\circ}C$	-4.4	-3.5	
Maximum Power Dissipation ^{b d}	P_D	$T_A=25^{\circ}C$	2.1	1.3	W
		$T_A=70^{\circ}C$	1.3	0.8	
Pulsed Drain Current ^c	I_{DM}	-25		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	$t \leq 10$ s	$R_{\theta JA}$	32	46	°C/W
	Steady State		60	75	
Junction-to-Ambient Thermal Resistance ^b	$t \leq 10$ s	$R_{\theta JA}$	45	60	
	Steady State		80	95	
Junction-to-Case Thermal Resistance	Steady State	$R_{\theta JC}$	16	25	

a Surface mounted on FR4 Board using 1 square inch pad size, 1oz copper

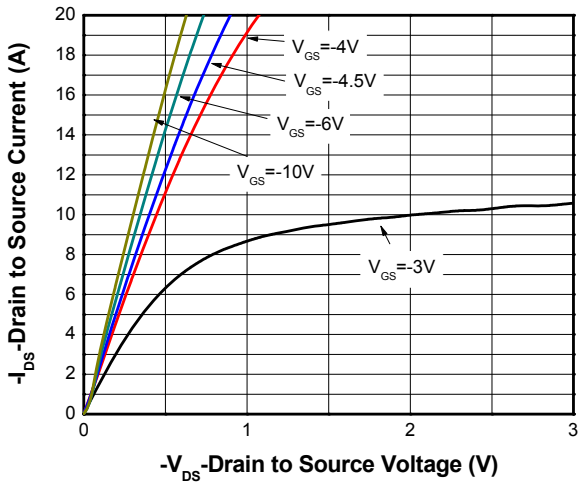
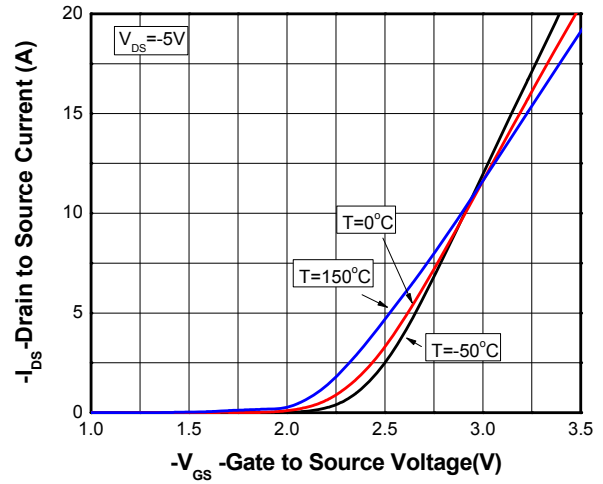
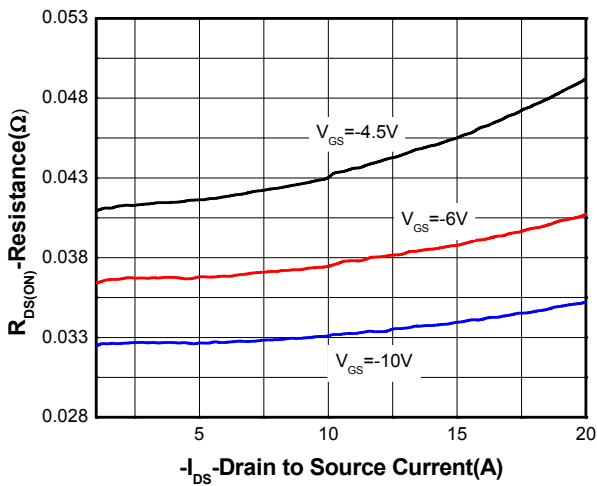
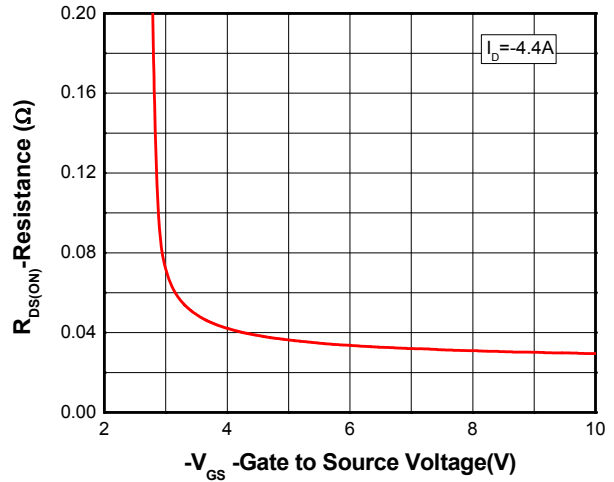
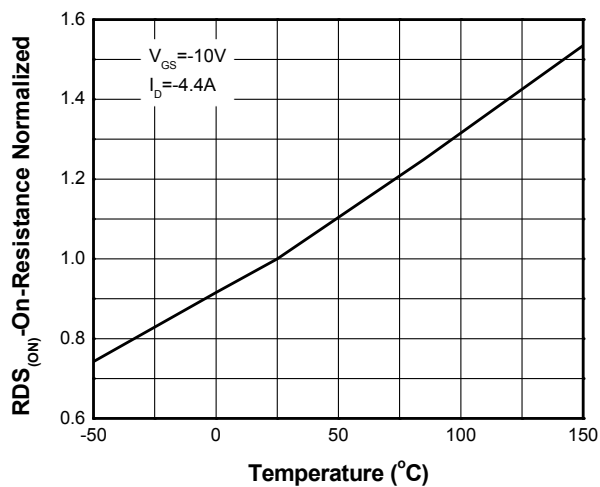
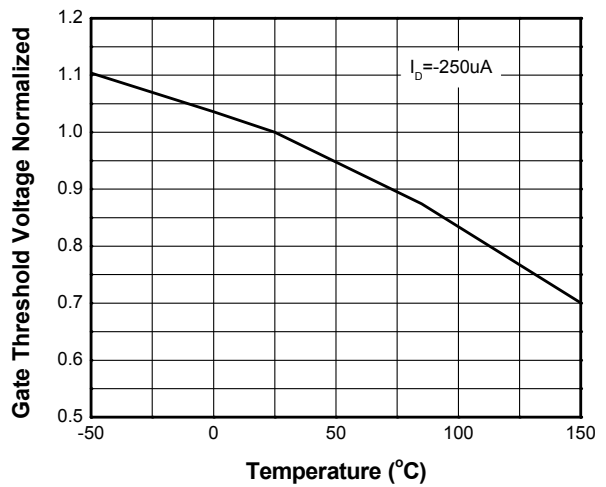
b Surface mounted on FR4 board using minimum pad size, 1oz copper

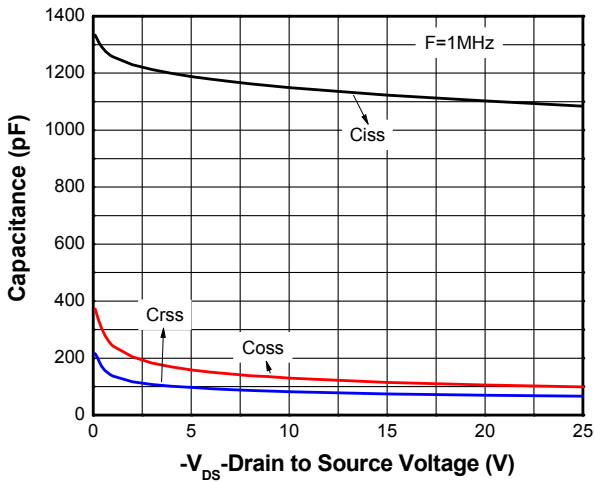
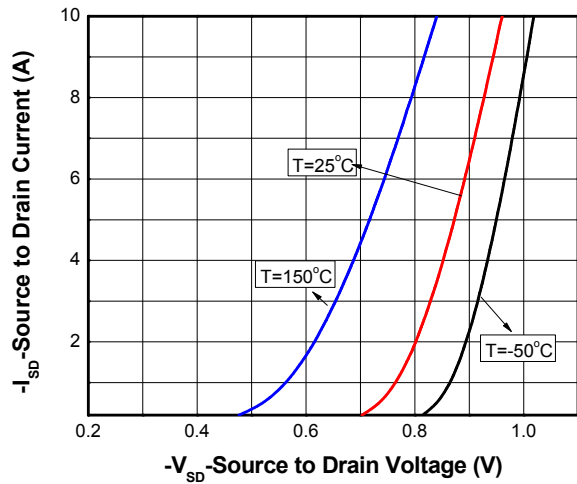
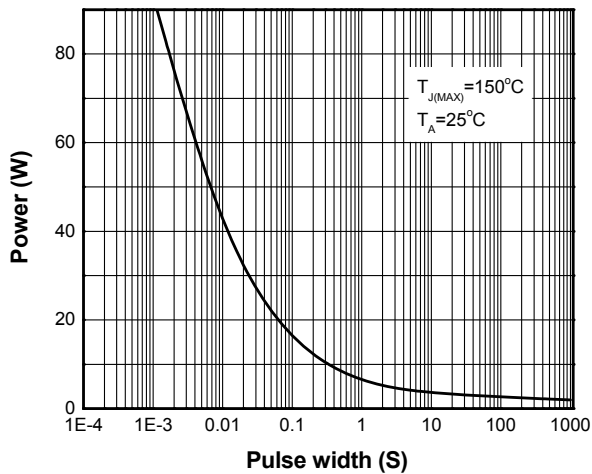
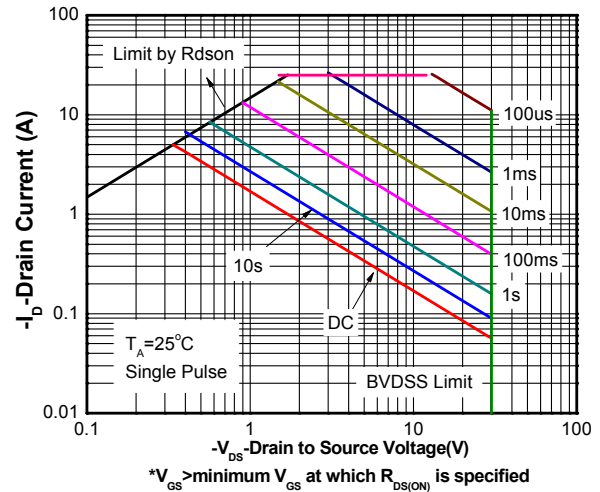
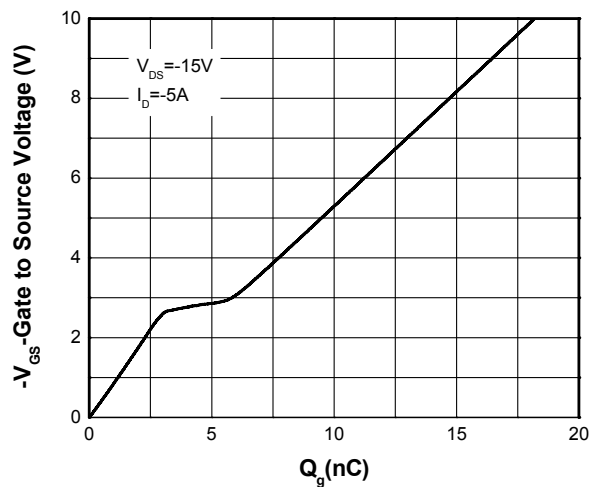
c Repetitive rating, pulse width limited by junction temperature, $t_p=10\mu s$, Duty Cycle=1%

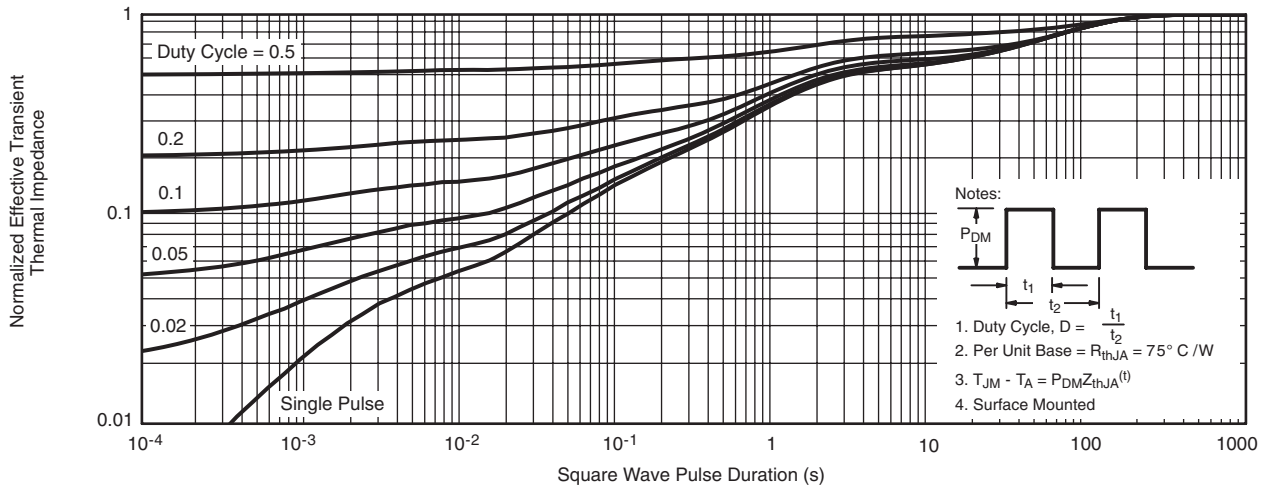
d Repetitive rating, pulse width limited by junction temperature $T_J=150^{\circ}C$.

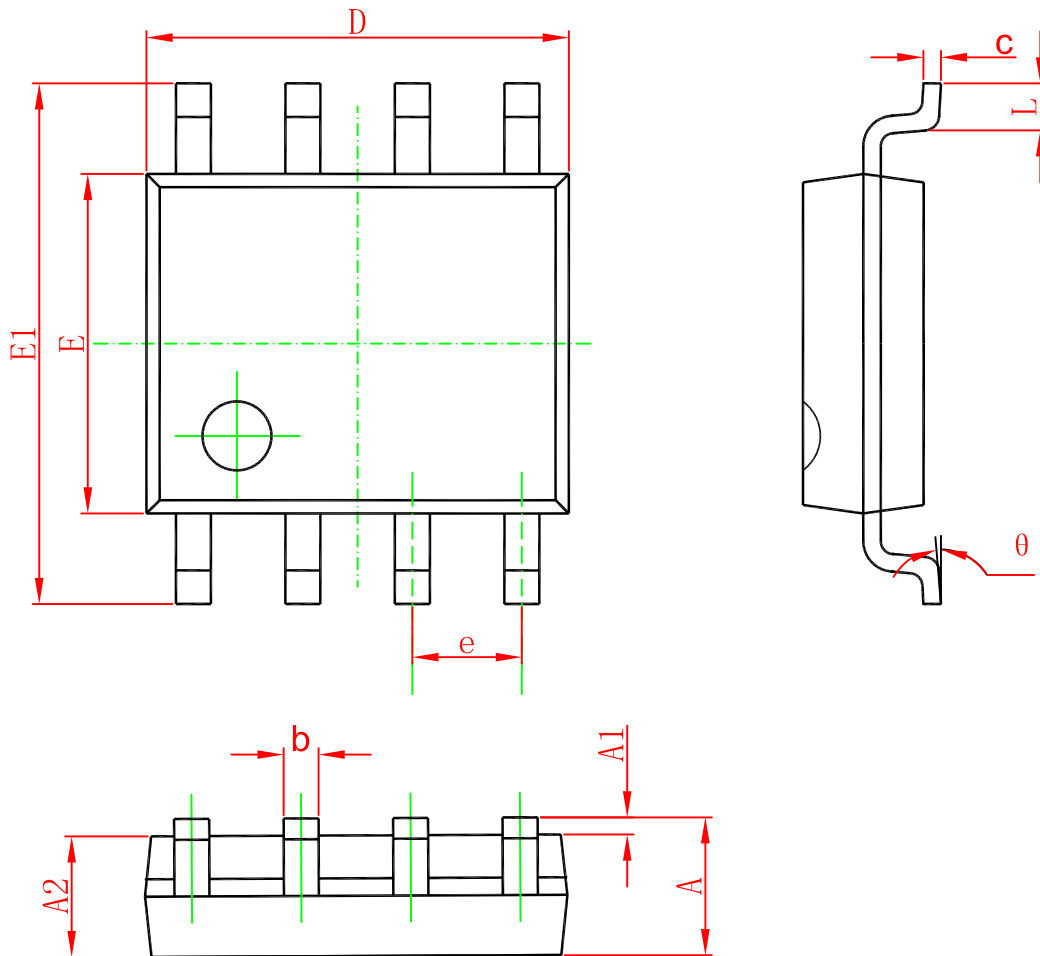
Electronics Characteristics (Ta=25°C, unless otherwise noted)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Drain-to-Source Breakdown Voltage	BV_{DSS}	$V_{GS} = 0\text{ V}, I_D = -250\mu\text{A}$	-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}	$V_{DS} = 0\text{ V}, V_{GS} = \pm 20\text{ V}$			± 100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{GS} = V_{DS}, I_D = -250\mu\text{A}$	-1.0	-1.8	-3.0	V
Drain-to-source On-resistance	$R_{DS(on)}$	$V_{GS} = -10\text{ V}, I_D = -4.4\text{ A}$		33	45	m Ω
		$V_{GS} = -4.5\text{ V}, I_D = -3.0\text{ A}$		43	66	
Forward Transconductance	g_{FS}	$V_{DS} = -5\text{ V}, I_D = -5\text{ A}$		6	16	S
CHARGES, CAPACITANCES AND GATE RESISTANCE						
Input Capacitance	C_{ISS}	$V_{GS} = 0\text{ V}, f = 1.0\text{ MHz}, V_{DS} = -15\text{ V}$		1120		pF
Output Capacitance	C_{OSS}			115		
Reverse Transfer Capacitance	C_{RSS}			74		
Total Gate Charge	$Q_{G(TOT)}$	$V_{GS} = -10\text{ V}, V_{DS} = -15\text{ V}, I_D = -5\text{ A}$		18.2		nC
Threshold Gate Charge	$Q_{G(TH)}$			2		
Gate-to-Source Charge	Q_{GS}			3.1		
Gate-to-Drain Charge	Q_{GD}			2.7		
SWITCHING CHARACTERISTICS						
Turn-On Delay Time	$t_d(ON)$	$V_{GS} = -10\text{ V}, V_{DS} = -15\text{ V}, I_D = -4.3\text{ A}, R_G = 6\Omega$		20		ns
Rise Time	t_r			10		
Turn-Off Delay Time	$t_d(OFF)$			48		
Fall Time	t_f			10		
BODY DIODE CHARACTERISTICS						
Forward Voltage	V_{SD}	$V_{GS} = 0\text{ V}, I_S = -2.5\text{ A}$		-0.8	-1.5	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)

Transient thermal response (Junction-to-Ambient)

Package outline dimensions
SOP-8L


Symbol	Dimensions in millimeter		
	Min.	Typ.	Max.
A	1.350	1.550	1.750
A1	0.100	0.175	0.250
A2	1.350	1.450	1.550
b	0.330	0.420	0.510
c	0.170	0.210	0.250
D	4.700	4.900	5.100
E	3.800	3.900	4.000
E1	5.800	6.000	6.200
e	1.270(BSC)		
L	0.400	0.835	1.270
θ	0°		8°