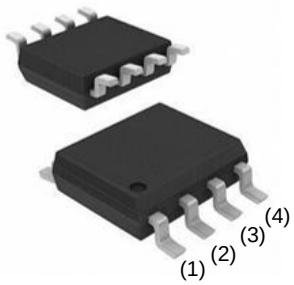
WPM9435A

Http://www.sh-willsemi.com

Single P-Channel, -30V, -6.3A, Power MOSFET

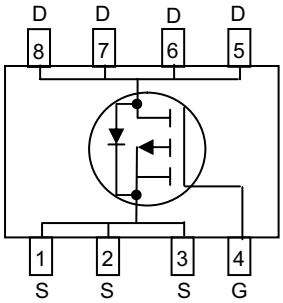
V_{DS} (V)	Typical $R_{DS(on)}$ (mΩ)
-30	33 @ V_{GS}=-10V
	43 @ V_{GS}=-4.5V



SOP-8L

Descriptions

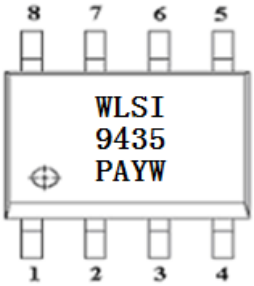
The WPM9435A is P-Channel enhancement MOS Field Effect Transistor. Uses advanced trench technology and design to provide excellent $R_{DS(ON)}$ with low gate charge. This device is suitable for use in DC-DC conversion, power switch and charging circuit. Standard Product WPM9435A is Pb-free.



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	4000/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]	T_A=25°C	I_D	-6.3	-5.0	A
	T_A=70°C		-5.1	-4.0	
Maximum Power Dissipation [a d]	T_A=25°C	P_D	2.7	1.7	W
	T_A=70°C		1.7	1.1	
Continuous Drain Current [b d]	T_A=25°C	I_D	-5.5	-4.4	A
	T_A=70°C		-4.4	-3.5	
Maximum Power Dissipation [b d]	T_A=25°C	P_D	2.1	1.3	W
	T_A=70°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 ≤ 10 s	$R_{\theta JA}$	32	46	°C/W
	Steady State		60	75	
Junction-to-Ambient Thermal Resistance [b]	t ≤ 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

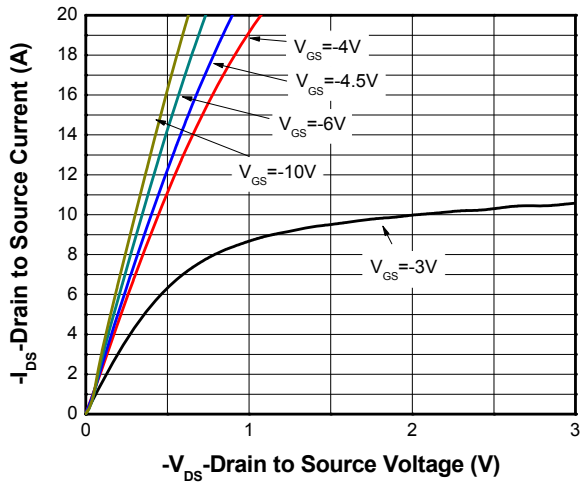
c Repetitive rating, pulse width limited by junction temperature, t_p=10μs, Duty Cycle=1%

d Repetitive rating, pulse width limited by junction temperature T_J=150°C.

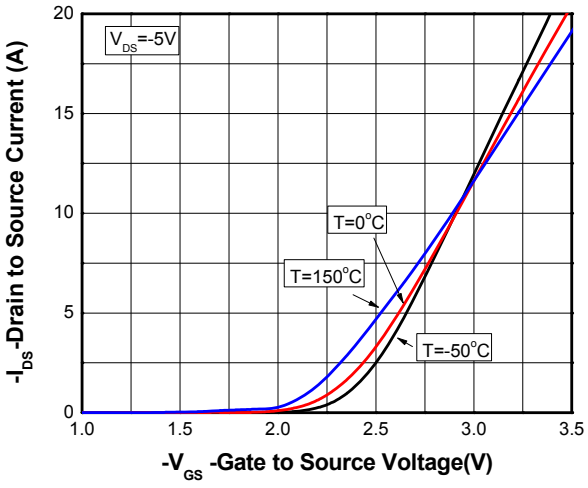
Electronics Characteristics (Ta=25°C, unless otherwise noted)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Drain-to-Source Breakdown Voltage	BV_{DSS}	V_{GS} = 0 V, I_D = -250uA	-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} = ±20V			±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 = -4.4A		33	45	mΩ
		V_{GS} = -4.5V, I_D = -3.0A		43	66	
Forward Transconductance	g_{FS}	V_{DS} = -5 V, I_D = -5A		6	16	S
CHARGES, CAPACITANCES AND GATE RESISTANCE						
Input Capacitance	C_{ISS}	V_{GS} = 0 V, f = 1.0MHz, V_{DS} = -15 V		1120		pF
Output Capacitance	C_{OSS}			115		
Reverse Transfer Capacitance	C_{RSS}			74		
Total Gate Charge	$Q_{G(TOT)}$	V_{GS} = -10 V, V_{DS} = -15 V, I_D =-5 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	td(ON)	V_{GS} = -10 V, V_{DS} =-15 V, I_D=-4.3A, R_G=6Ω		20		ns
Rise Time	tr			10		
Turn-Off Delay Time	td(OFF)			48		
Fall Time	tf			10		
BODY DIODE CHARACTERISTICS						
Forward Voltage	V_{SD}	V_{GS} = 0 V, I_S = -2.5A		-0.8	-1.5	V

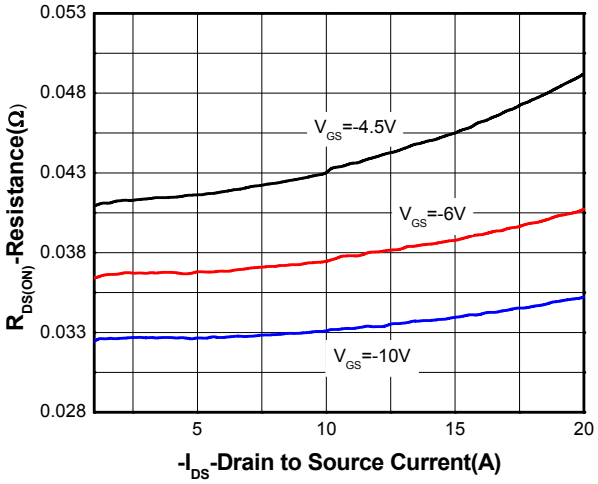
Typical Characteristics (Ta=25°C, unless otherwise noted)



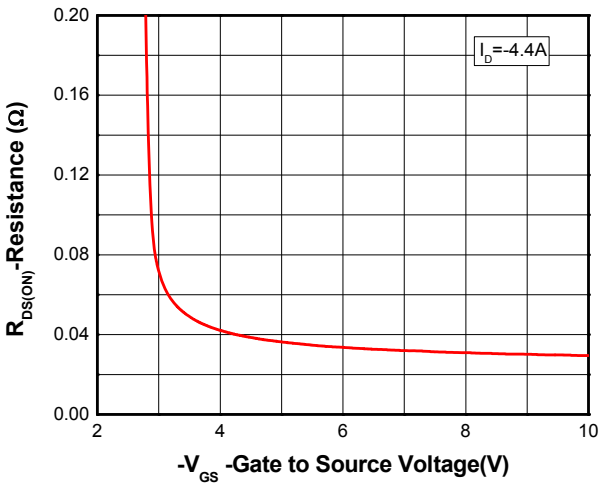
Output characteristics



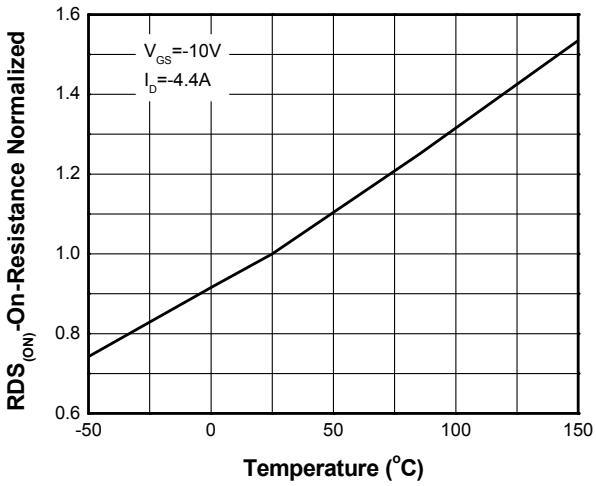
Transfer characteristics



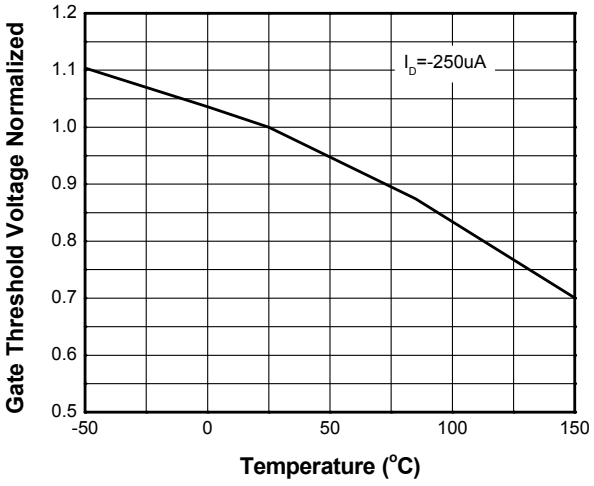
On-Resistance vs. Drain current



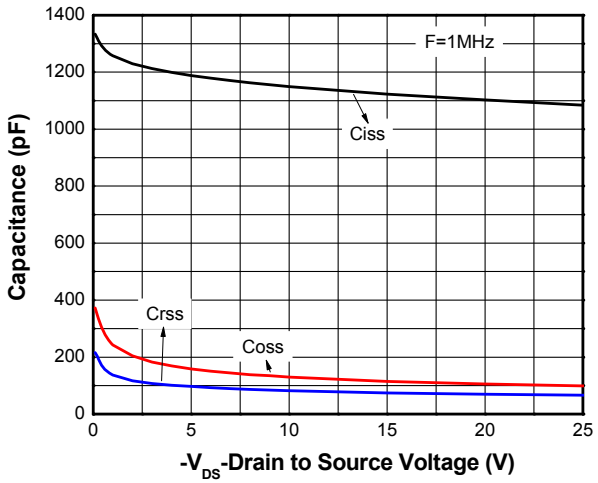
On-Resistance vs. Gate-to-source voltage



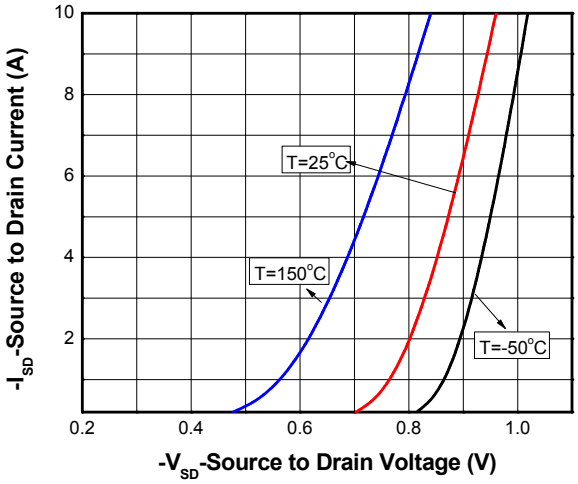
On-Resistance vs. Junction temperature



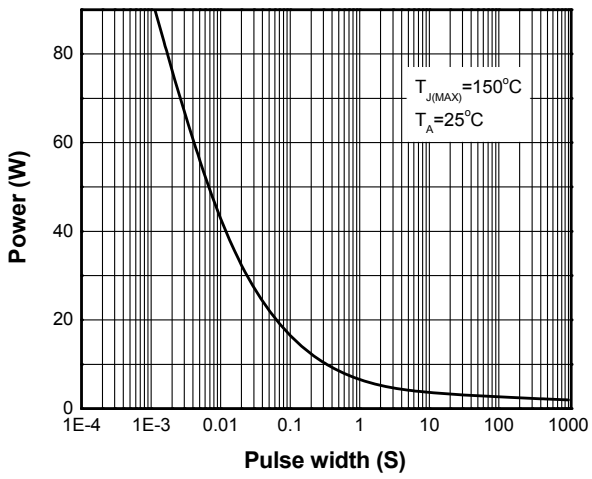
Threshold voltage vs. Temperature



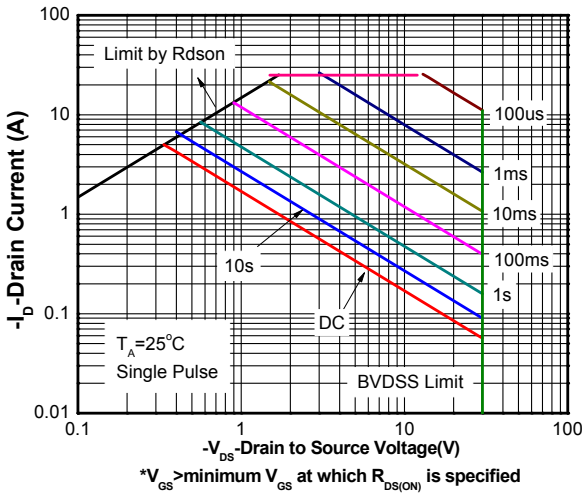
Capacitance



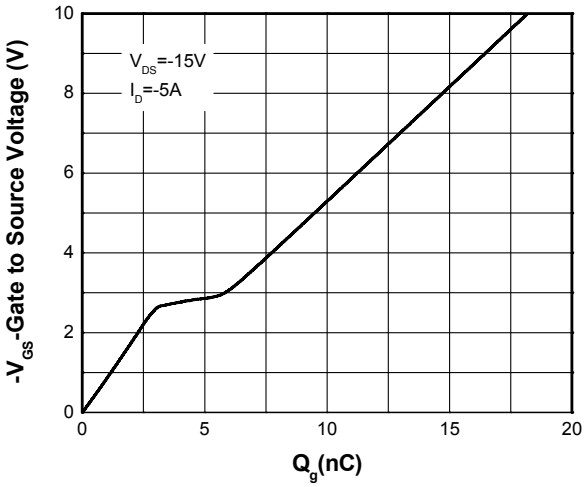
Body diode forward voltage



Single pulse power

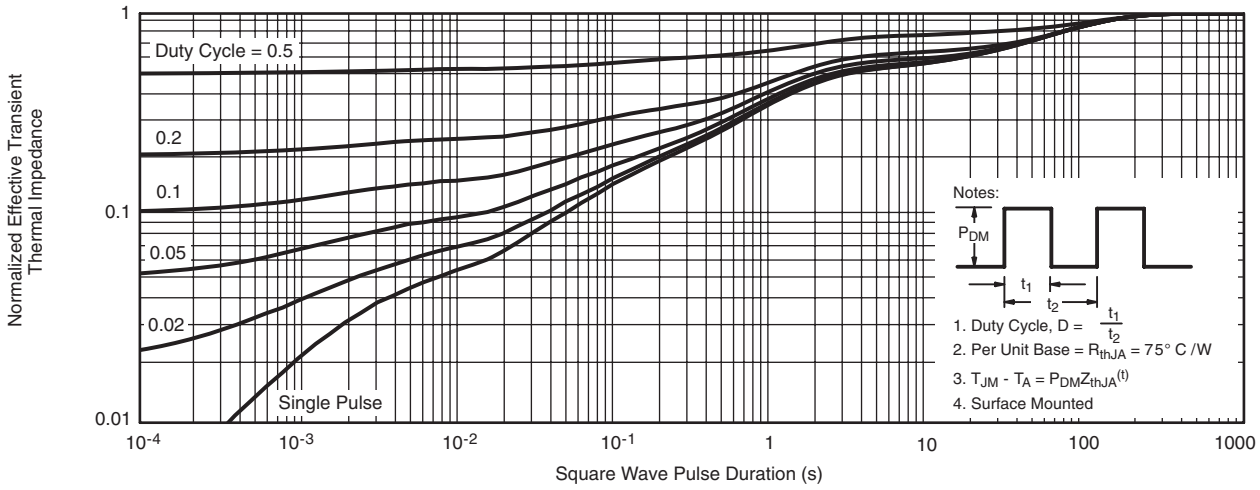


Safe operating power



Gate Charge Characteristics

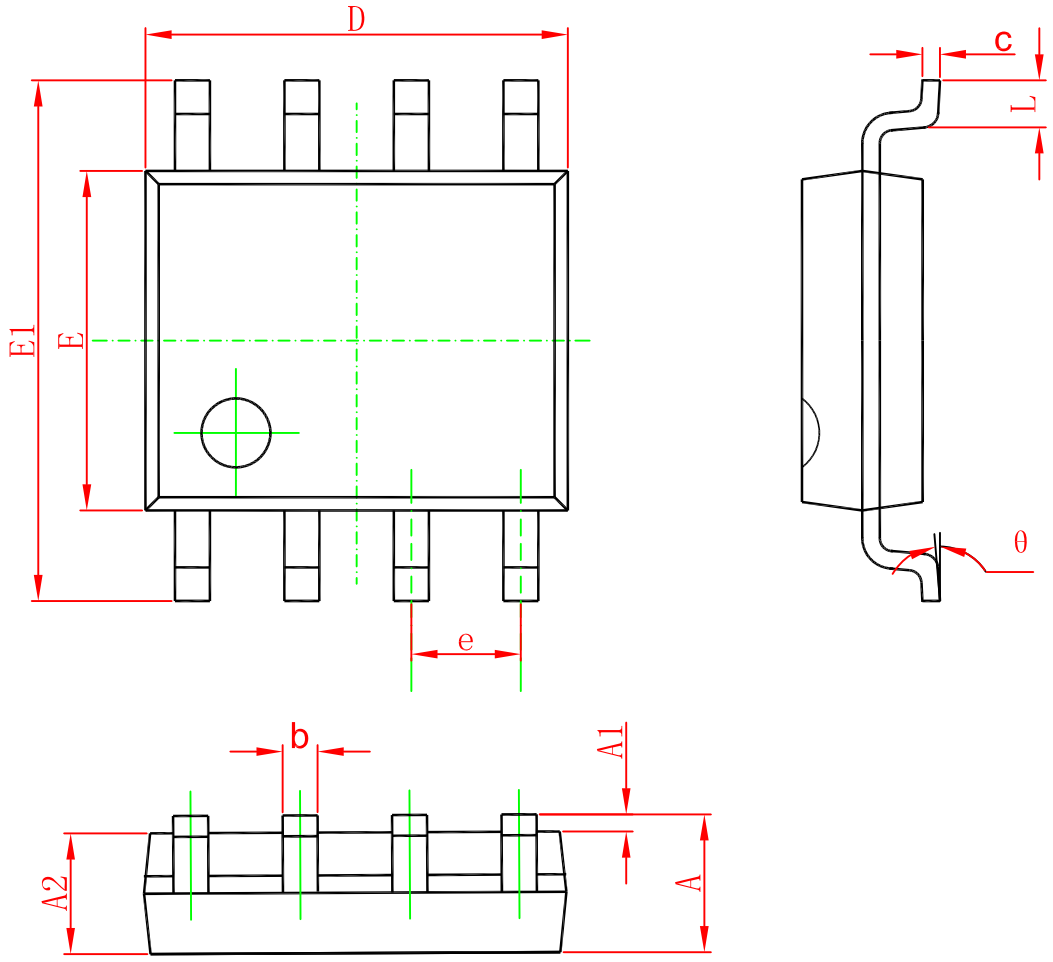
Transient thermal response (Junction-to-Ambient)



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°