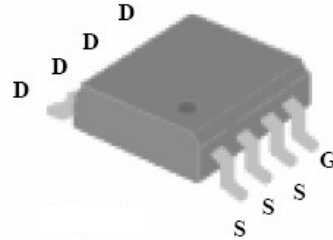
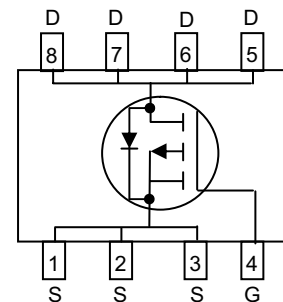
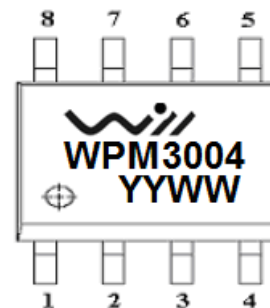


WPM3004
Single P-Channel, -30V, -5.0A, Power MOSFET

V _{DS} (V)	R _{ds(on)} (Ω)
-30	0.053@ V _{GS} = - 10.0V
	0.053@ V _{GS} = - 10.0V
	0.079@ V _{GS} = - 4.5V
	0.079@ V _{GS} = - 4.5V

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

SOP-8L
Descriptions

The WPM3004 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 WPM3004 is Pb-free.


Pin configuration (Top view)


WPM3004 = Device Code
 YY = Year
 WW = Week

Marking
Features

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

Applications

- Driver for Relay, Solenoid, Motor, LED etc.
- DC-DC converter circuit
- Power Switch
- Load Switch
- Charging

Order information

Device	Package	Shipping
WPM3004-8/TR	SOP-8L	2500/Reel&Tape

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	$T_A=25^\circ\text{C}$	I_D	-5.0	-3.8	A
	$T_A=70^\circ\text{C}$		-4.0	-3.1	
Maximum Power Dissipation ^a	$T_A=25^\circ\text{C}$	P_D	2.0	1.2	W
	$T_A=70^\circ\text{C}$		1.3	0.7	
Continuous Drain Current ^b	$T_A=25^\circ\text{C}$	I_D	-4.2	-3.5	A
	$T_A=70^\circ\text{C}$		-3.4	-2.8	
Maximum Power Dissipation ^b	$T_A=25^\circ\text{C}$	P_D	1.4	1.0	W
	$T_A=70^\circ\text{C}$		0.9	0.6	
Pulsed Drain Current ^c		I_{DM}	-22		A
Operating Junction Temperature		T_J	150		$^\circ\text{C}$
Lead Temperature		T_L	260		$^\circ\text{C}$
Storage Temperature Range		T_{stg}	-55 to 150		$^\circ\text{C}$

Thermal resistance ratings

Parameter		Symbol	Typical	Maximum	Unit
Junction-to-Ambient Thermal Resistance ^a	$t \leq 10 \text{ s}$	$R_{\theta JA}$	43	61	$^\circ\text{C/W}$
	Steady State		74	103	
Junction-to-Ambient Thermal Resistance ^b	$t \leq 10 \text{ s}$	$R_{\theta JA}$	64	85	
	Steady State		95	125	
Junction-to-Case Thermal Resistance		$R_{\theta JC}$	33	40	

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

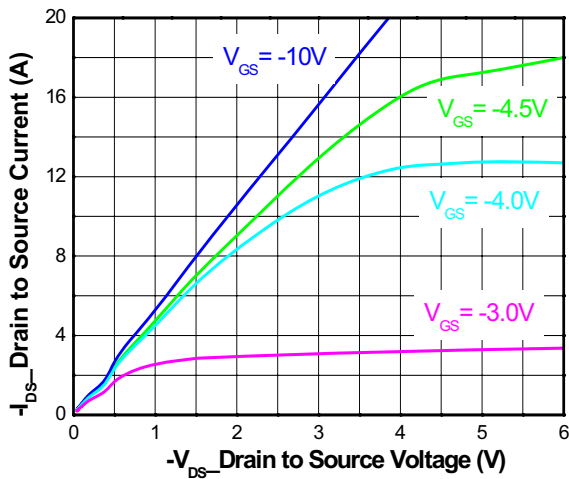
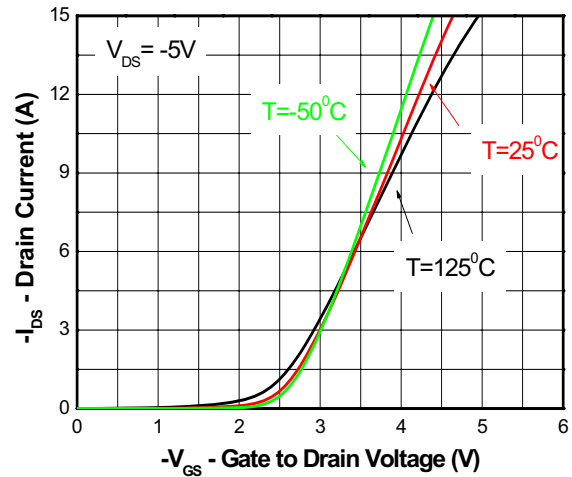
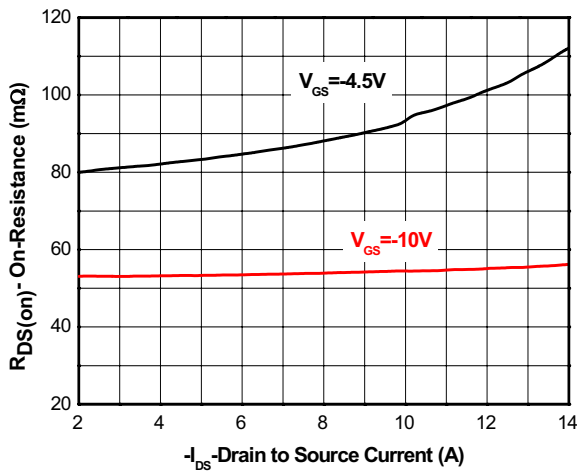
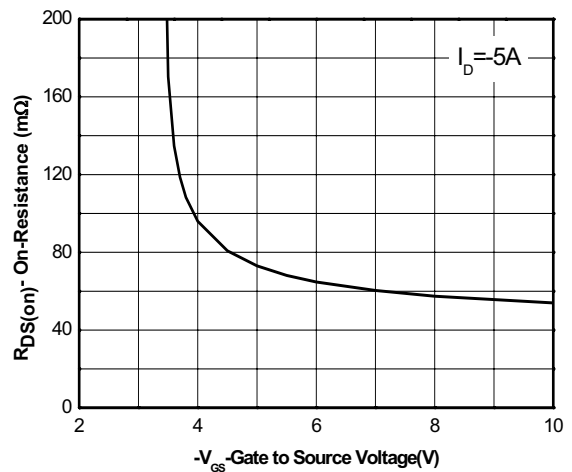
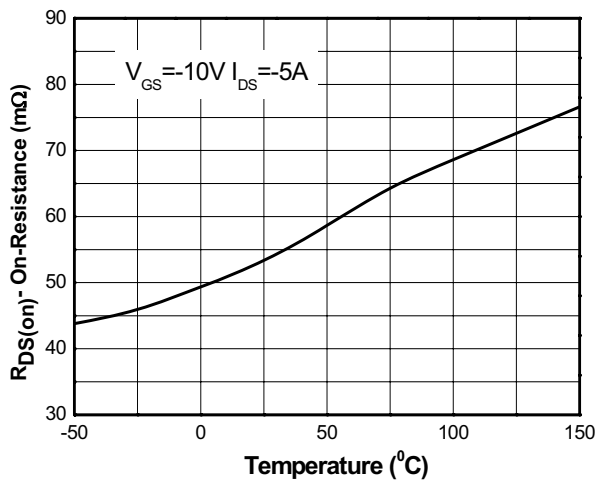
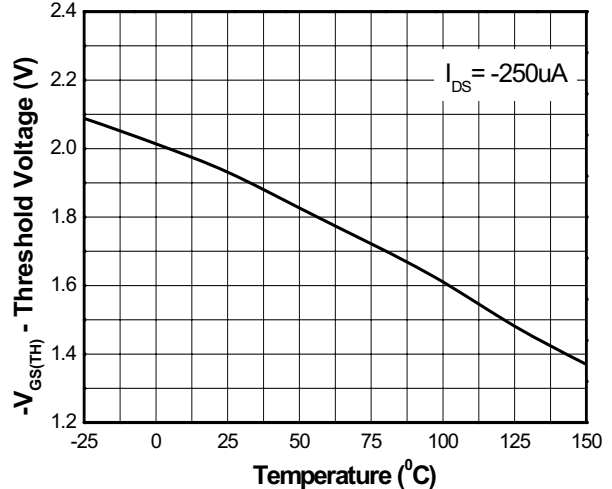
b Surface mounted on FR4 board using minimum pad size, 1oz copper

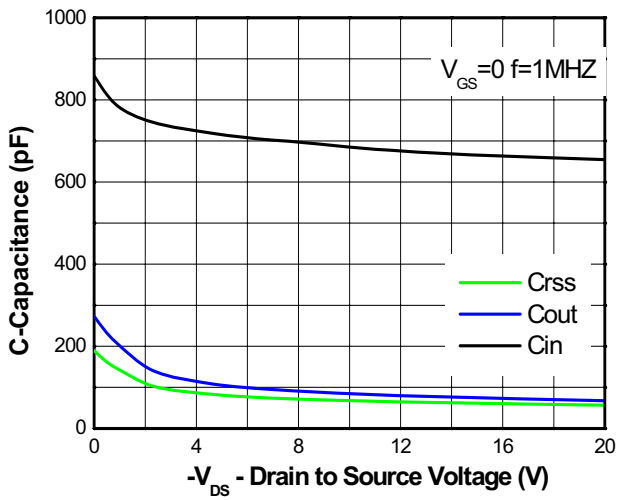
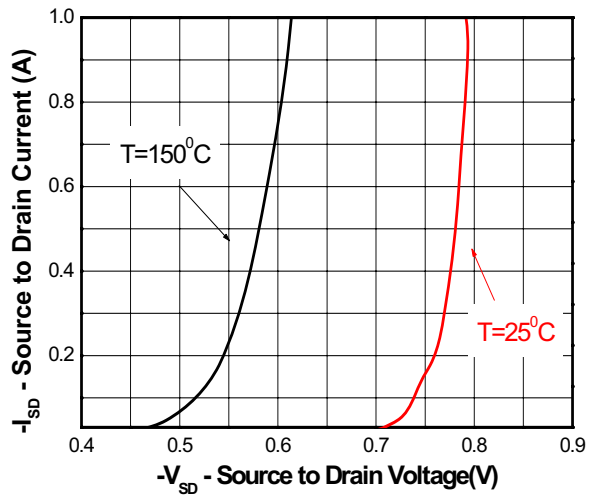
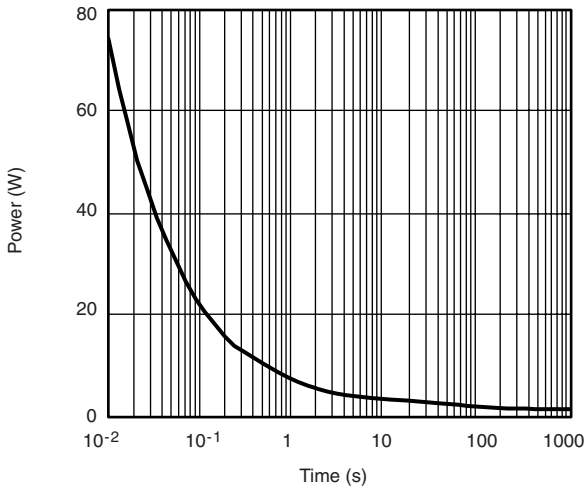
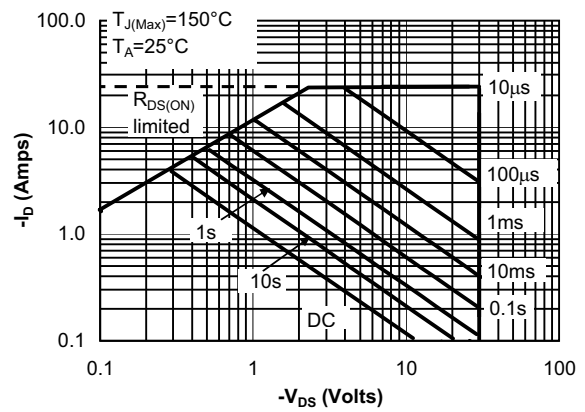
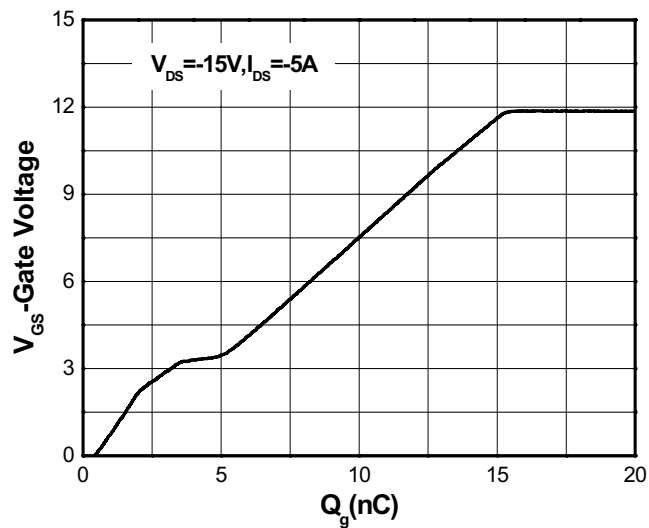
c Repetitive rating, pulse width limited by junction temperature, $t_p=10\mu\text{s}$, Duty Cycle=1%

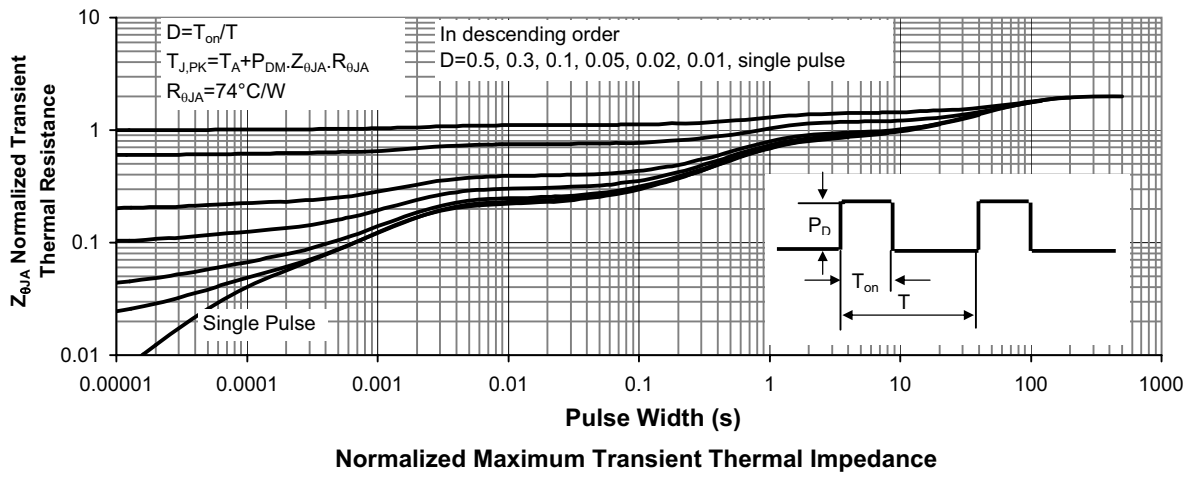
d Repetitive rating, pulse width limited by junction temperature $T_J=150^\circ\text{C}$.

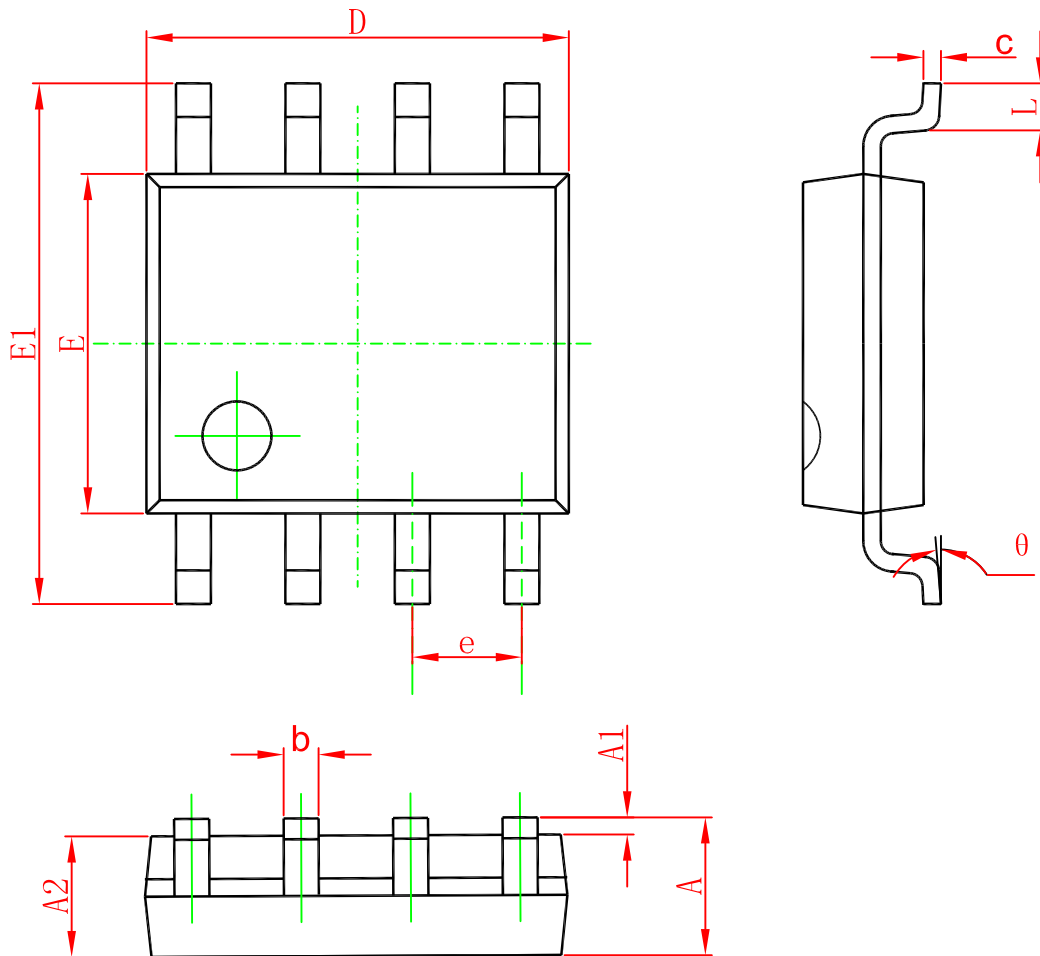
Electronics Characteristics (Ta=25°C, unless otherwise noted)

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	$V_{GS(TH)}$	$V_{GS} = V_{DS}, I_D = -250\mu\text{A}$	-1.5	-2.0	-2.5	V
Drain-to-source On-resistance	$R_{DS(on)}$	$V_{GS} = -10\text{ V}, I_D = -5.0\text{ A}$		53	60	m Ω
		$V_{GS} = -10\text{ V}, I_D = -3.0\text{ A}$		53	60	
		$V_{GS} = -4.5\text{ V}, I_D = -4.0\text{ A}$		79	90	
		$V_{GS} = -4.5\text{ V}, I_D = -3.0\text{ A}$		79	90	
Forward Transconductance	g_{FS}	$V_{DS} = -5\text{ V}, I_D = -5.0\text{ A}$		7.6		S
CHARGES, CAPACITANCES AND GATE RESISTANCE						
Input Capacitance	C_{ISS}	$V_{GS} = 0\text{ V}, f = 1.0\text{ MHz}, V_{DS} = -15\text{ V}$		670		pF
Output Capacitance	C_{OSS}			75		
Reverse Transfer Capacitance	C_{RSS}			62		
Total Gate Charge	$Q_{G(TOT)}$	$V_{GS} = -10\text{ V}, V_{DS} = -15\text{ V}, I_D = -5.0\text{ A}$		14.0		nC
Threshold Gate Charge	$Q_{G(TH)}$			1.31		
Gate-to-Source Charge	Q_{GS}			2.0		
Gate-to-Drain Charge	Q_{GD}			2.45		
SWITCHING CHARACTERISTICS						
Turn-On Delay Time	$t_d(ON)$	$V_{GS} = -10\text{ V}, V_{DS} = -15\text{ V}, R_L = 5.0\ \Omega, R_G = 15\ \Omega$		6.8		ns
Rise Time	t_r			3.2		
Turn-Off Delay Time	$t_d(OFF)$			25.2		
Fall Time	t_f			4.4		
BODY DIODE CHARACTERISTICS						
Forward Voltage	V_{SD}	$V_{GS} = 0\text{ V}, I_S = -1.0\text{ A}$	-0.55	-0.78	-1.50	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 (Junction-to-Ambient)

Safe operating power

Gate Charge Characteristics



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°