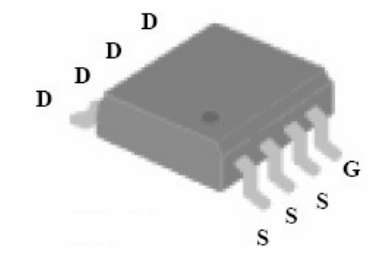
WPM3004

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

V_{DS} (V)	Rds(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

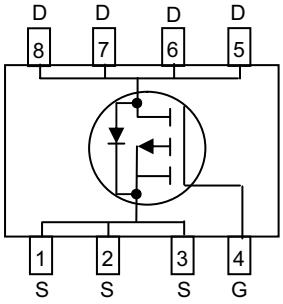
Http//:www.willsemi.com



SOP-8L

Descriptions

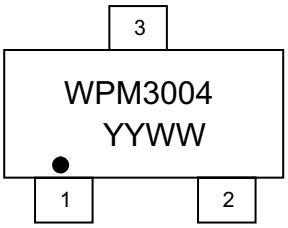
The WPM3004 is P-Channel enhancement MOS Field Effect Transistor. Uses advanced trench technology and design to provide excellent $R_{DS\ (ON)}$ with low gate charge. This device is suitable for use in DC-DC conversion, power switch and charging circuit. Standard Product WPM3004 is Pb-free.



Pin configuration (Top view)

Features

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



WPM3004 = Device Code
YY = Year
WW = Week

Marking

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

Thermal resistance ratings

Parameter		Symbol	Typical	Maximum	Unit
Junction-to-Ambient Thermal Resistance [a]	t ≤ 10 s	$R_{\theta JA}$	43	61	°C/W
	Steady State		74	103	
Junction-to-Ambient Thermal Resistance [b]	t ≤ 10 s	$R_{\theta JA}$	64	85	
	Steady State		95	125	
Junction-to-Case Thermal Resistance	Steady State	$R_{\theta JC}$	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

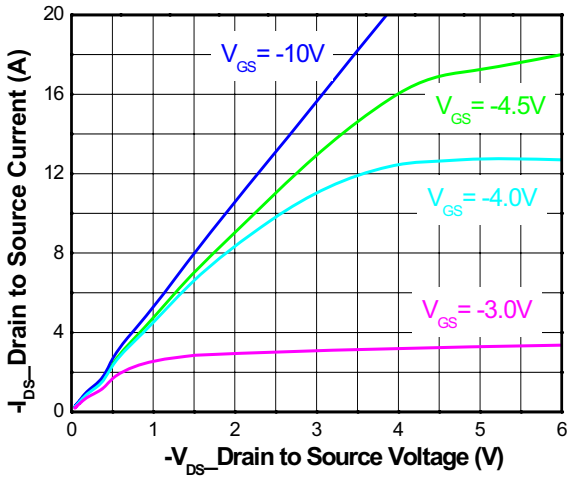
c Repetitive rating, pulse width limited by junction temperature, t_p=10μs, Duty Cycle=1%

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

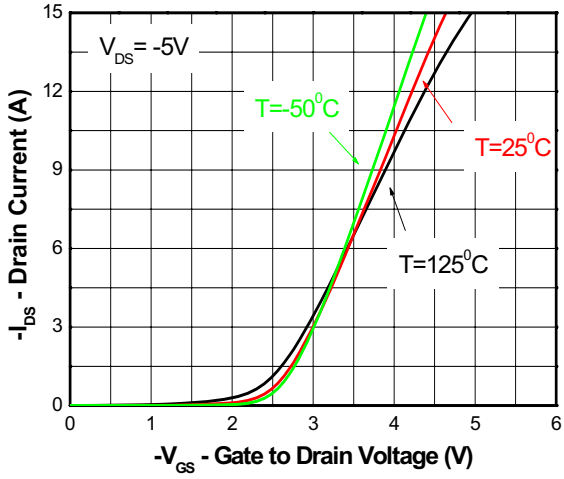
Electronics Characteristics (Ta=25°C, unless otherwise noted)

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} = -24 V, 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	-1.5	-2.0	-2.5	V
Drain-to-source On-resistance	$R_{DS(on)}$	V_{GS} = -10V, I_D = -5.0A		53	60	mΩ
		V_{GS} = -10V, I_D = -3.0A		53	60	
		V_{GS} = -4.5V, I_D = -4.0A		79	90	
		V_{GS} = -4.5V, I_D= -3.0A		79	90	
Forward Transconductance	g_{FS}	V_{DS} = -5 V, I_D = -5.0A		7.6		S
CHARGES, CAPACITANCES AND GATE RESISTANCE						
Input Capacitance	C_{ISS}	V_{GS} = 0 V, f = 1.0 MHz, V_{DS} = -15 V		670		pF
Output Capacitance	C_{OSS}			75		
Reverse Transfer Capacitance	C_{RSS}			62		
Total Gate Charge	$Q_{G(TOT)}$	V_{GS} = -10 V, V_{DS} = -15 V, I_D = -5.0 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	td(ON)	V_{GS} = -10 V, V_{DS} = -15V, R_L=5.0 Ω , R_G=15 Ω		6.8		ns
Rise Time	tr			3.2		
Turn-Off Delay Time	td(OFF)			25.2		
Fall Time	tf			4.4		
BODY DIODE CHARACTERISTICS						
Forward Voltage	V_{SD}	V_{GS} = 0 V, I_S = -1.0A	-0.55	-0.78	-1.50	V

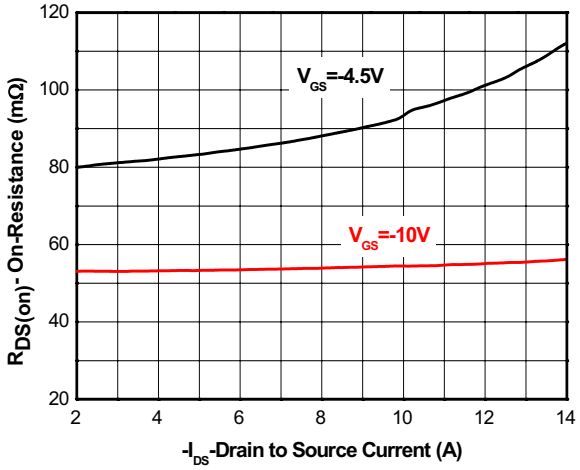
Typical Characteristics (Ta=25°C, unless otherwise noted)



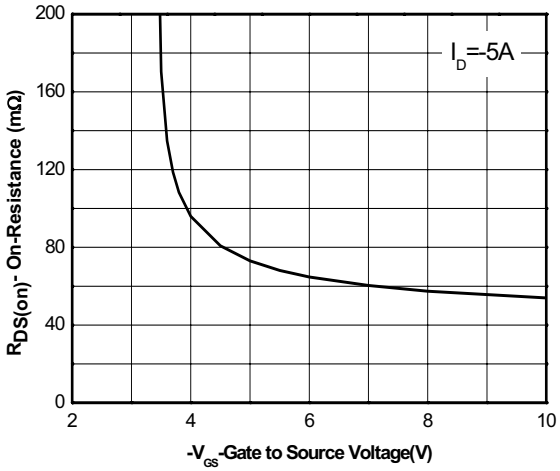
Output characteristics



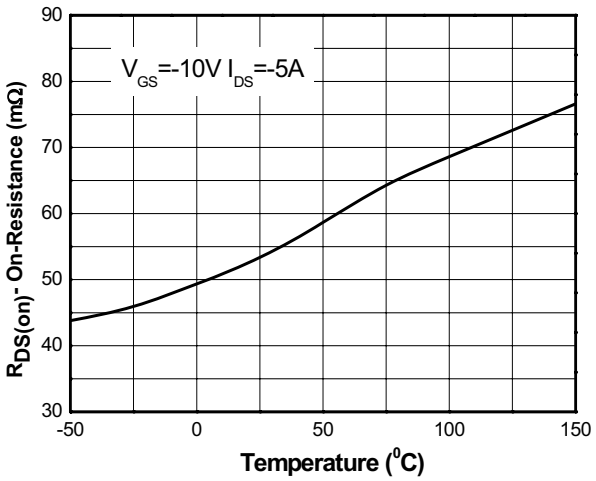
Transfer characteristics



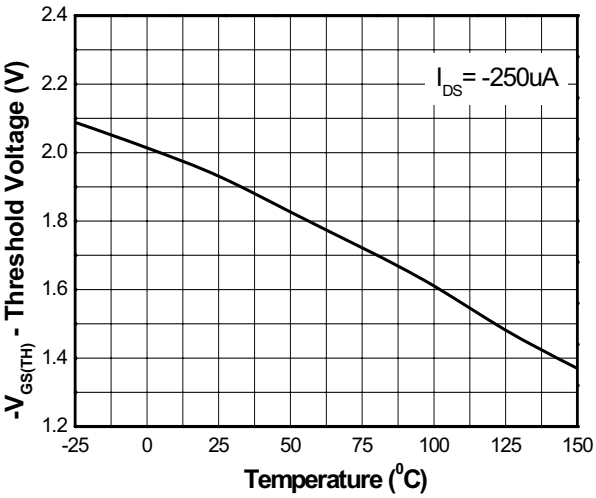
On-Resistance vs. Drain current



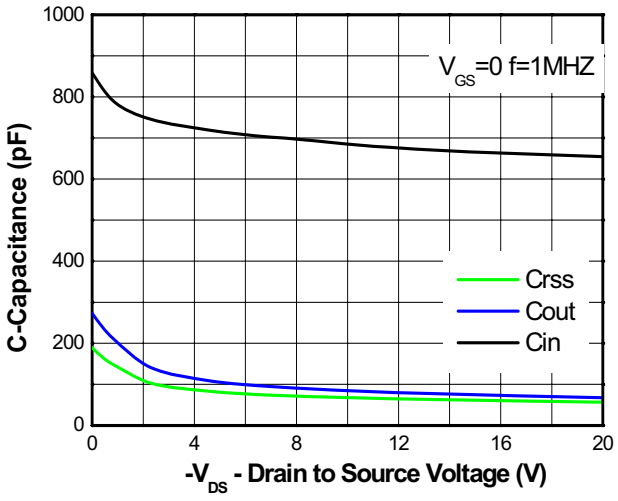
On-Resistance vs. Gate-to-Source voltage



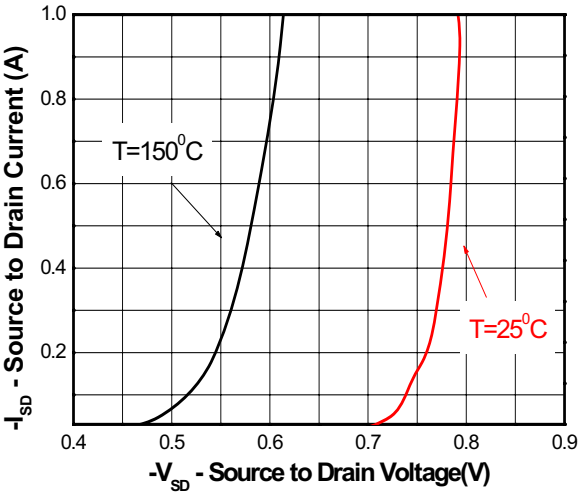
On-Resistance vs. Junction temperature



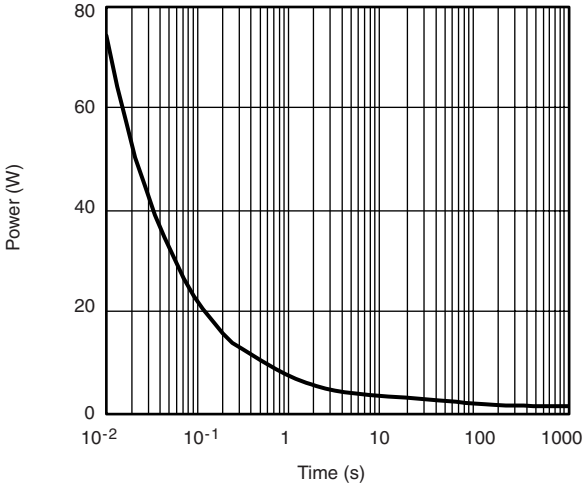
Threshold voltage vs. Temperature



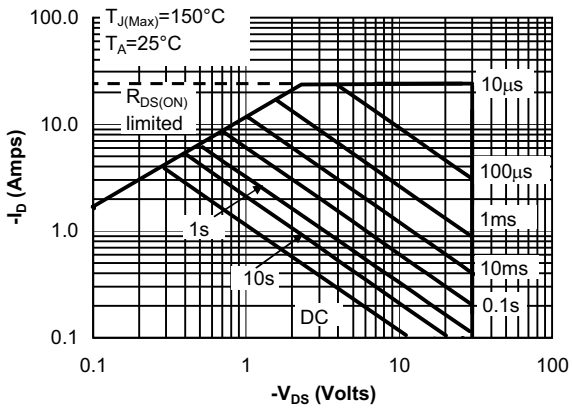
Capacitance



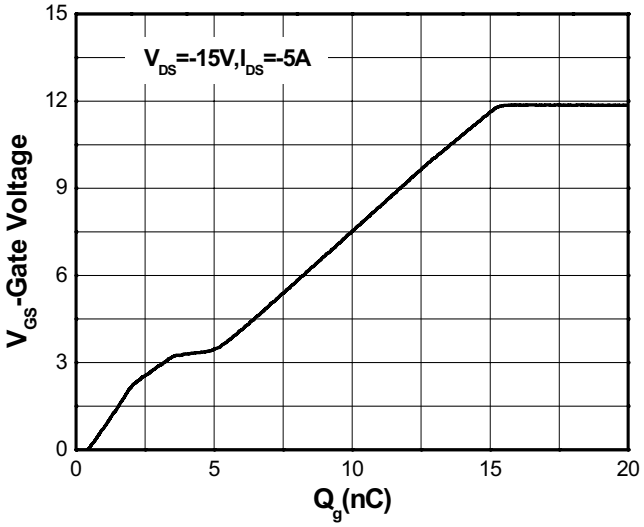
Body diode forward voltage



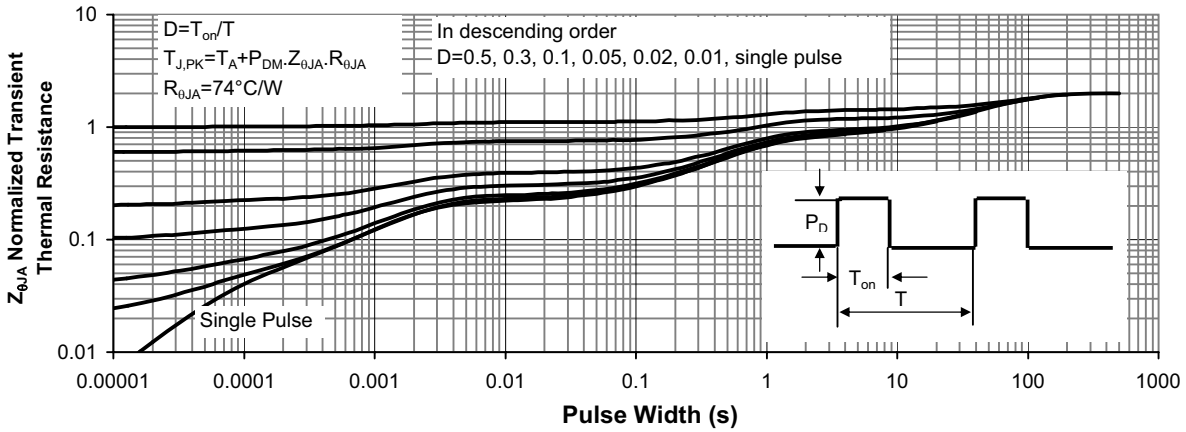
Single Pulse Power (Junction-to-Ambient)



Safe operating power



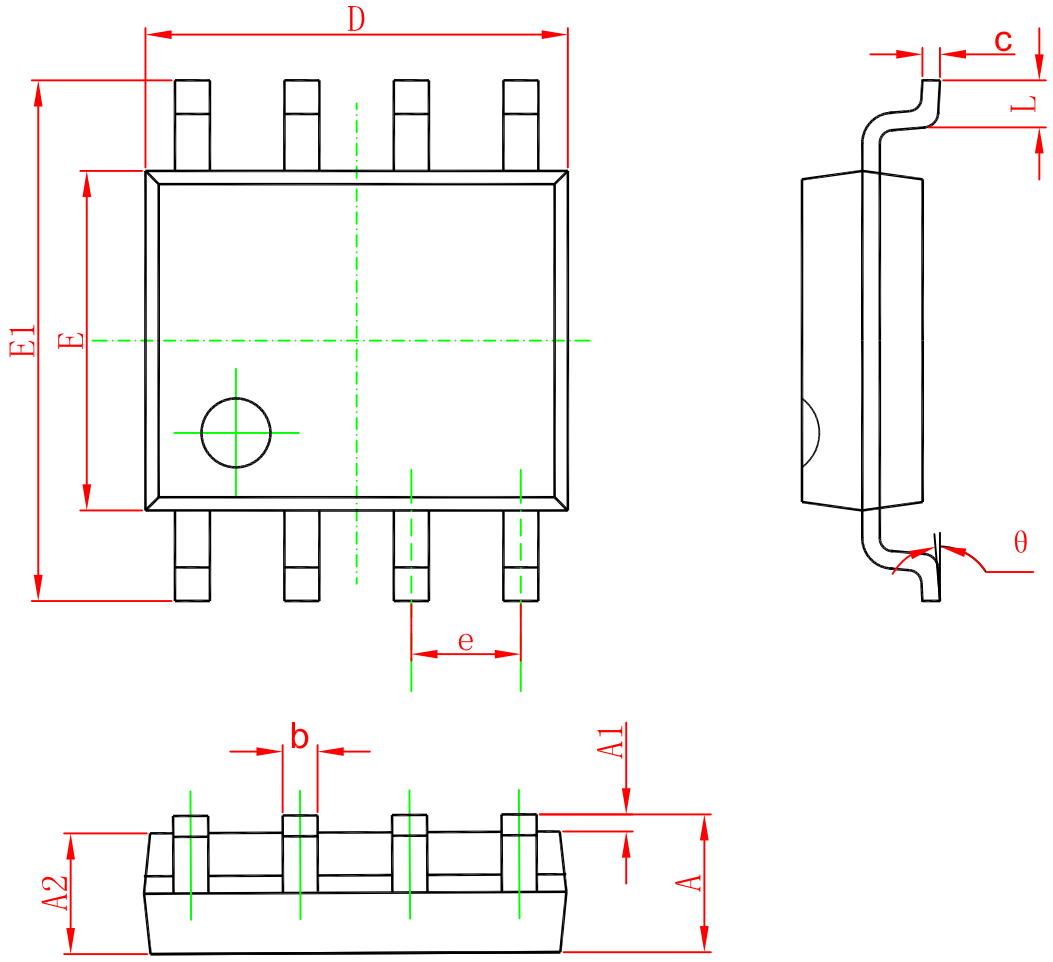
Gate Charge Characteristics



Normalized Maximum Transient Thermal Impedance

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°