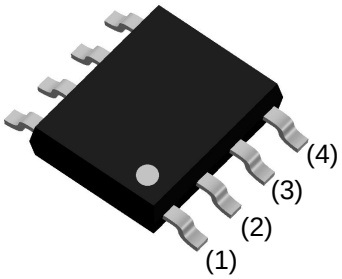
WPMD4953

Dual P-Channel, -30V, -4.9A, Power MOSFET

Http//:www.willsemi.com

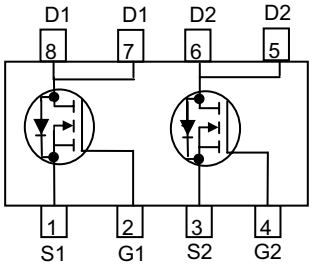
V_{DS} (V)	Rds(on) (Ω)
-30	0.049@ V_{GS}=-10V
	0.070@ V_{GS}=-4.5V



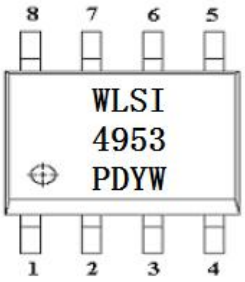
SOP-8L

Descriptions

The WPMD4953 is the Dual 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 WPMD4953 is Pb-free and Halogen-free.



Pin configuration (Top view)



WLSI = Company
4953 = Device Code
PD = Special Code
Y = Year
W = Week(A~z)

Marking

Features

- Super high density cell design for extremely low $R_{DS(ON)}$
- Exceptional on-resistance and maximum DC current capability
- SOP-8L package design

Applications

- Power Management in Note book
- Portable Equipment
- Battery Powered System
- DC/DC Converter
- Load Switch
- DSC
- LCD Display inverter

Order information

Device	Package	Shipping
WPMD4953-8/TR	SOP-8L	4000/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	-4.9	-3.8	A
	T_A=70°C		-3.9	-3.0	
Maximum Power Dissipation [a]	T_A=25°C	P_D	1.9	1.1	W
	T_A=70°C		1.2	0.7	
Continuous Drain Current [b]	T_A=25°C	I_D	-4.5	-3.6	A
	T_A=70°C		-3.6	-2.9	
Maximum Power Dissipation [b]	T_A=25°C	P_D	1.6	1.0	W
	T_A=70°C		1.0	0.6	
Pulsed Drain Current [c]		I_{DM}	-25		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

Single Operation					
Parameter		**Symbol**	**Typical**	**Maximum**	**Unit**
Junction-to-Ambient Thermal Resistance [a]	t ≤ 10 s	$R_{\theta JA}$	56	65	°C/W
	Steady State		87	105	
Junction-to-Ambient Thermal Resistance [b]	t ≤ 10 s	$R_{\theta JA}$	64	76	
	Steady State		96	115	
Junction-to-Case Thermal Resistance	Steady State	$R_{\theta JC}$	32	40	
Dual Operation					
Junction-to-Ambient Thermal Resistance [a]	t ≤ 10 s	$R_{\theta JA}$	61	70	°C/W
	Steady State		92	112	
Junction-to-Ambient Thermal Resistance [b]	t ≤ 10 s	$R_{\theta JA}$	69	82	
	Steady State		102	120	
Junction-to-Case Thermal Resistance	Steady State	$R_{\theta JC}$	36	45	

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

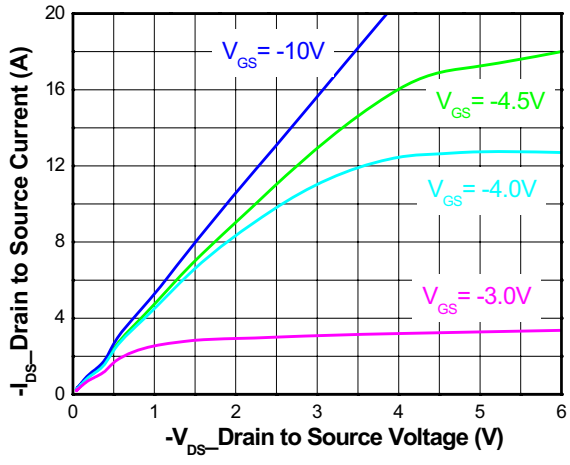
c Repetitive rating, pulse width limited by junction temperature, t_p=10μs, Duty Cycle=1%

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

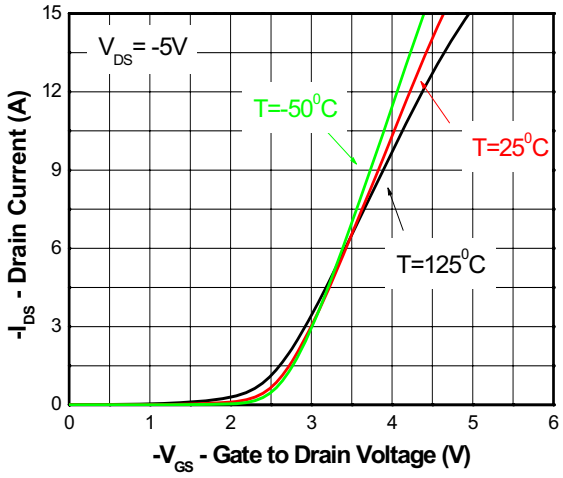
Electronics Characteristics (Ta=25°C, unless otherwise noted)

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	-1.5	-1.9	-2.5	V
Drain-to-source On-resistance	$R_{DS(on)}$	V_{GS} = -10V, I_D = -4.9A		49	60	mΩ
		V_{GS} = -4.5V, I_D = -4.0A		70	90	
Forward Transconductance	g_{FS}	V_{DS} = -15 V, I_D = -3.0A		5.0		S
CHARGES, CAPACITANCES AND GATE RESISTANCE						
Input Capacitance	C_{ISS}	V_{GS} = 0 V, f = 1MHz, 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 = -4.9 A		14.0		nC
Threshold Gate Charge	$Q_{G(TH)}$			1.31		
Gate-to-Source Charge	Q_{GS}			1.80		
Gate-to-Drain Charge	Q_{GD}			1.60		
SWITCHING CHARACTERISTICS						
Turn-On Delay Time	td(ON)	V_{GS} = -10 V, V_{DS} = -15 V, 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	-1.5	V

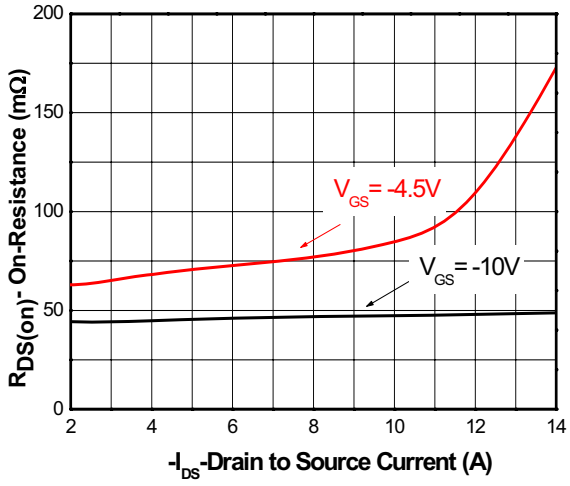
Typical Characteristics (Ta=25°C, unless otherwise noted)



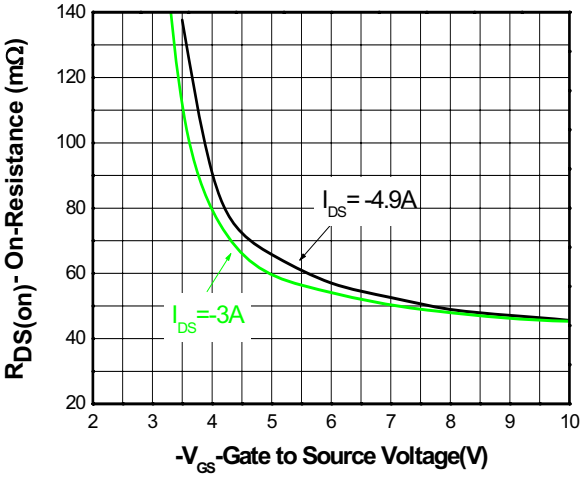
Output characteristics



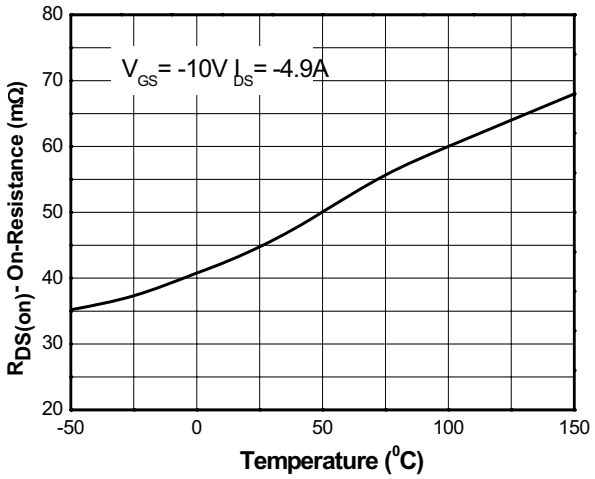
Transfer characteristics



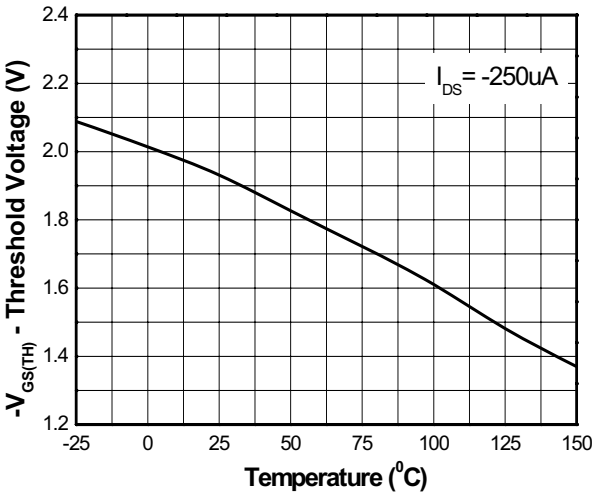
On-Resistance vs. Drain current



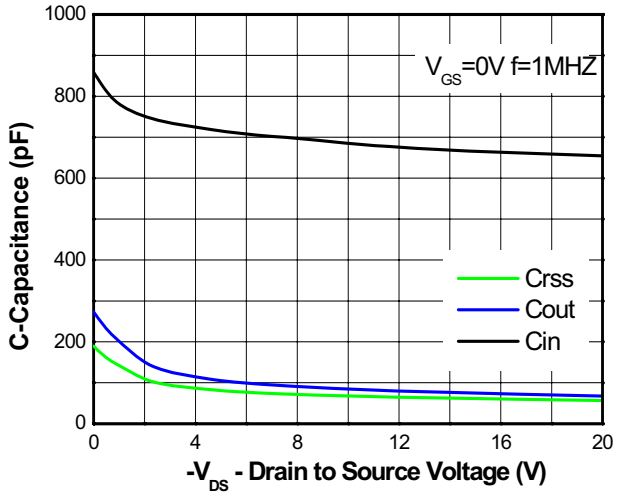
On-Resistance vs. Gate-to-Source voltage



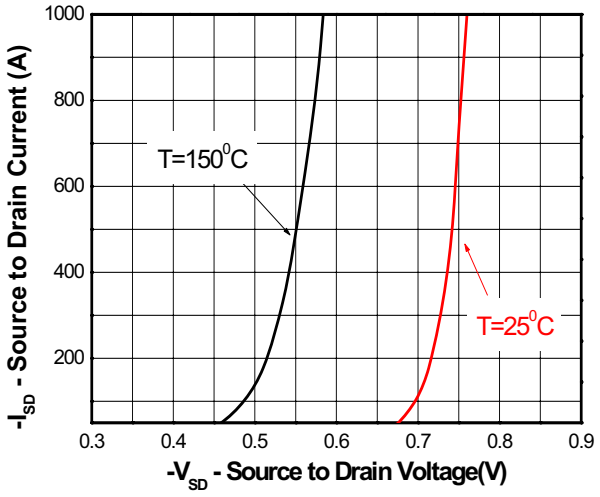
On-Resistance vs. Junction temperature



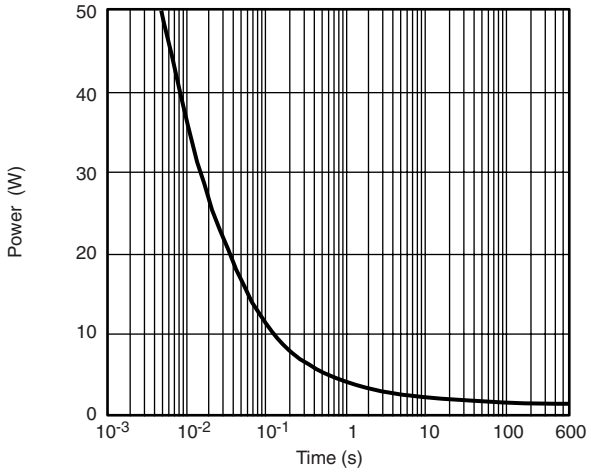
Threshold voltage vs. Temperature



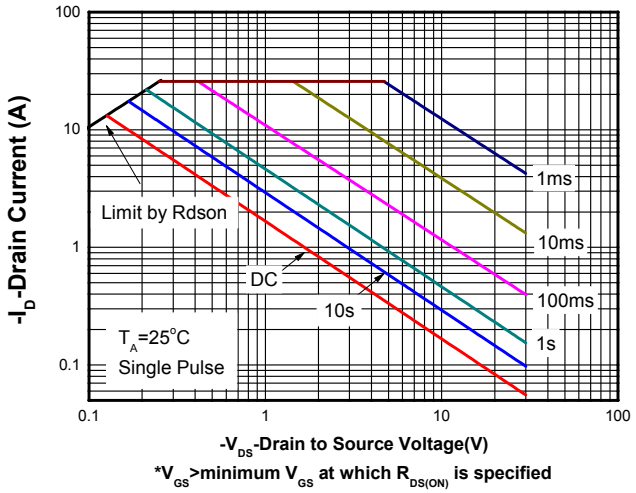
Capacitance



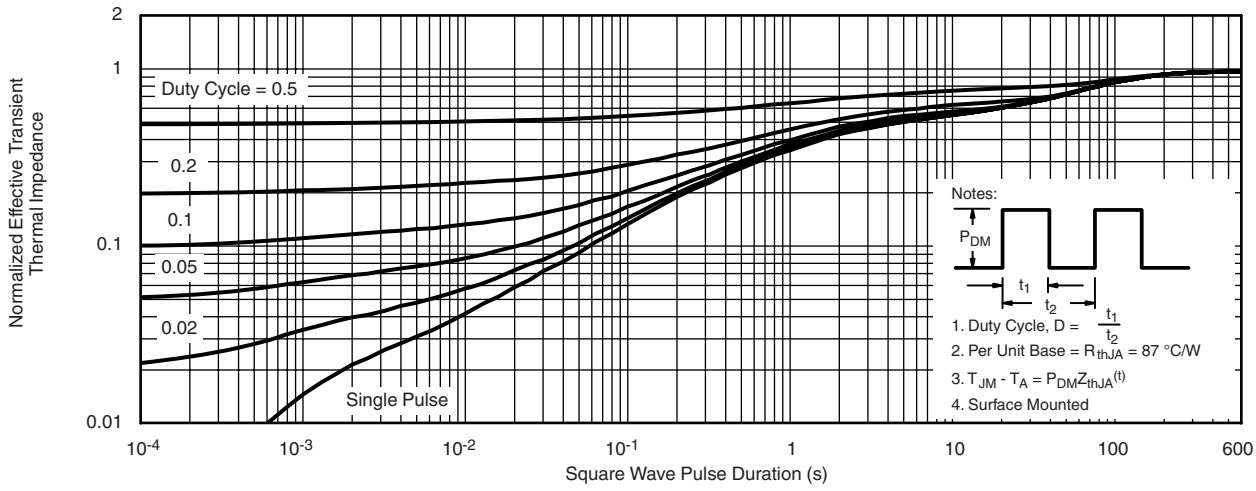
Body diode forward voltage



Single pulse power



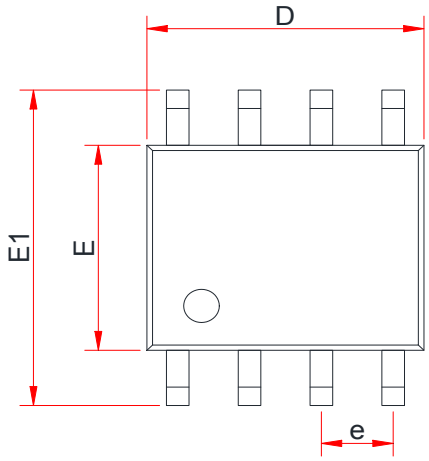
Safe operating power



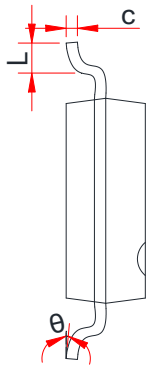
Normalized Thermal Transient Impedance, Junction-to-Ambient

Package outline dimensions

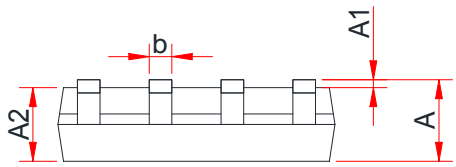
SOP-8L



TOP VIEW



SIDE VIEW

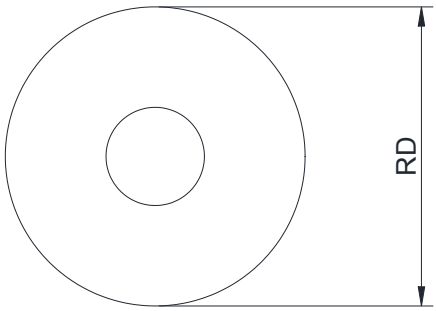


SIDE VIEW

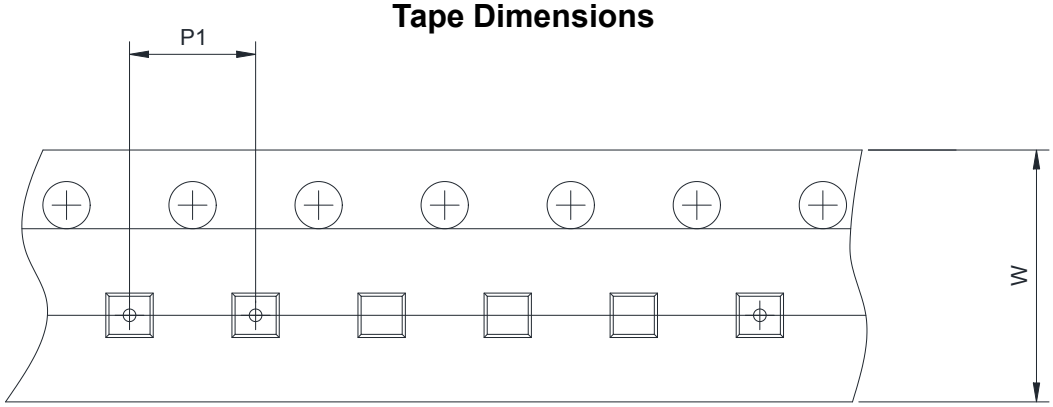
Symbol	Dimensions In Millimeters (mm)		
	Min.	Typ.	Max.
A	1.35	1.55	1.75
A1	0.05	0.15	0.25
A2	1.25	1.40	1.65
b	0.33	-	0.51
c	0.15	-	0.26
D	4.70	4.90	5.10
E	3.70	3.90	4.10
E1	5.80	6.00	6.20
e	1.27BSC		
L	0.40	-	1.27
θ	0°	-	8°

TAPE AND REEL INFORMATION

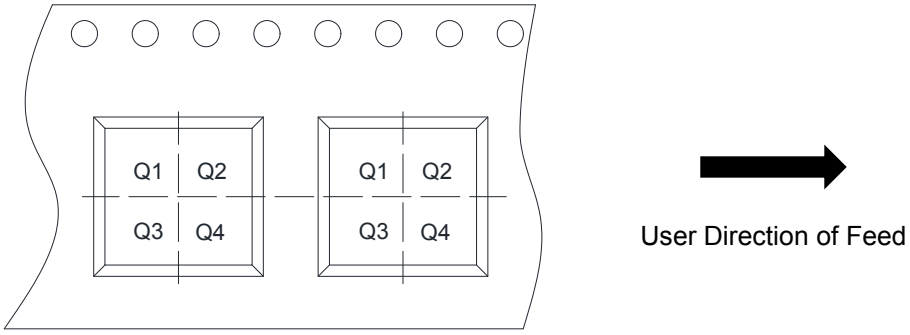
Reel Dimensions



Tape Dimensions



Quadrant Assignments For PIN1 Orientation In Tape



RD	Reel Dimension	☐ 7inch ☑ 13inch
W	Overall width of the carrier tape	☐ 8mm ☑ 12mm
P1	Pitch between successive cavity centers	☐ 2mm ☐ 4mm ☑ 8mm
Pin1	Pin1 Quadrant	☑ Q1 ☐ Q2 ☐ Q3 ☐ Q4