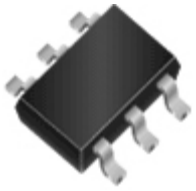
WPMD2012

Dual P-Channel, -20V, -0.64A, Small Signal MOSFET

Http//:www.willsemi.com

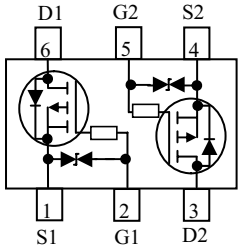
V_{DS} (V)	Rds(on) (Ω)
-20	0.550@ V_{GS}=-4.5V
	0.740@ V_{GS}=-2.5V
	0.910@ V_{GS}=-1.8V



SOT-363

Descriptions

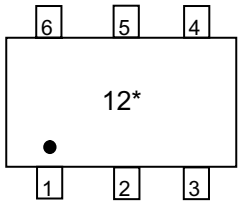
The WPMD2012 is P-Channel enhancement MOS Field Effect Transistor. Uses advanced trench technology and design to provide excellent $R_{DS\ (ON)}$ with low gate charge. This device is suitable for use in DC-DC conversion, load switch and level shift. Standard Product WPMD2012 is Pb-free.



Pin configuration (Top view)

Features

- Trench Technology
- Supper high density cell design
- Excellent ON resistance
- Extremely Low Threshold Voltage
- Small package SOT-363



12 = Device Code
* = Month (A~Z)

Marking

Applications

- DC-DC converter circuit
- Small Signal Switch
- Load Switch
- Level Shift

Order information

Device	Package	Shipping
WPMD2012-6/TR	SOT-363	3000/Reel&Tape

Absolute Maximum ratings

Parameter		Symbol	10 S	Steady State	Unit
Drain-Source Voltage		V_{DS}	-20		V
Gate-Source Voltage		V_{GS}	±6		
Continuous Drain Current [a]	T_A=25°C	I_D	-0.64	-0.57	A
	T_A=70°C		-0.51	-0.46	
Maximum Power Dissipation [a]	T_A=25°C	P_D	0.37	0.29	W
	T_A=70°C		0.24	0.19	
Continuous Drain Current [b]	T_A=25°C	I_D	-0.55	-0.50	A
	T_A=70°C		-0.44	-0.40	
Maximum Power Dissipation [b]	T_A=25°C	P_D	0.27	0.22	W
	T_A=70°C		0.17	0.14	
Pulsed Drain Current [c]		I_{DM}	-1.0		A
Operating Junction Temperature		T_J	150		°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	$R_{\theta JA}$	280	330	°C/W
	Steady State		340	420	
Junction-to-Ambient Thermal Resistance [b]	t ≤ 10 s	$R_{\theta JA}$	380	455	
	Steady State		460	545	
Junction-to-Case Thermal Resistance	Steady State	$R_{\theta JC}$	280	320	
Dual Operation					
Junction-to-Ambient Thermal Resistance [a]	t ≤ 10 s	$R_{\theta JA}$	315	365	°C/W
	Steady State		371	436	
Junction-to-Ambient Thermal Resistance [b]	t ≤ 10 s	$R_{\theta JA}$	425	490	
	Steady State		492	580	
Junction-to-Case Thermal Resistance	Steady State	$R_{\theta JC}$	285	325	

a. Surface mounted on FR4 Board using 1 in sq pad size, 1oz Cu.

b. Surface mounted on FR4 board using the minimum recommended pad size, 1oz Cu.

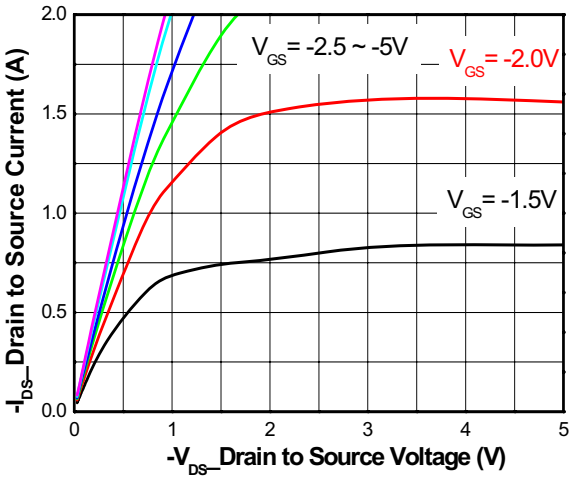
c. Repetitive rating, pulse width limited by junction temperature, tp=10μs, Duty Cycle=1%

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

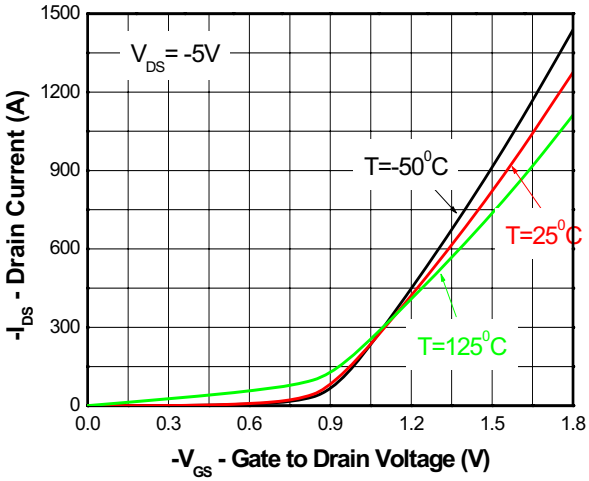
Electronics Characteristics (Ta=25°C, unless otherwise noted)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Drain-to-Source Breakdown Voltage	BV_{DSS}	V_{GS} = 0 V, I_D = −250uA	-20			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} =-16 V, V_{GS} = 0V			-1	uA
Gate-to-source Leakage Current	I_{GSS}	V_{DS} = 0 V, V_{GS} =±5V			-5	uA
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	V_{GS} = V_{DS}, I_D = −250uA	-0.4	-0.65	-0.90	V
Drain-to-source On-resistance	$R_{DS(on)}$	VGS = −4.5V, ID =−0.45A		550	810	mΩ
		VGS = −2.5V, ID = −0. 35A		740	1050	
		VGS = −1.8V, ID = −0. 25A		910	1300	
Forward Transconductance	g_{FS}	VDS = −5 V, ID = -0.45A		1.25		S
CHARGES, CAPACITANCES AND GATE RESISTANCE						
Input Capacitance	C_{ISS}	V_{GS} = 0 V, f = 100KHz, V_{DS} = −10 V		74.5		pF
Output Capacitance	C_{OSS}			10.8		
Reverse Transfer Capacitance	C_{RSS}			10.2		
Total Gate Charge	$Q_{G(TOT)}$	V_{GS} = −4.5 V, V_{DS} = −10 V, I_D = -0.45A		1.8		nC
Threshold Gate Charge	$Q_{G(TH)}$			0.12		
Gate-to-Source Charge	Q_{GS}			0.18		
Gate-to-Drain Charge	Q_{GD}			0.74		
SWITCHING CHARACTERISTICS						
Turn-On Delay Time	td(ON)	V_{GS} = -4.5 V, V_{DS} = -10 V, I_D=-0.45A, R_G=6 Ω		45		ns
Rise Time	tr			140		
Turn-Off Delay Time	td(OFF)			1500		
Fall Time	tf			2100		
BODY DIODE CHARACTERISTICS						
Forward Voltage	V_{SD}	V_{GS} = 0 V, I_S = -0.15A	-0.50	-0.65	-1.50	V

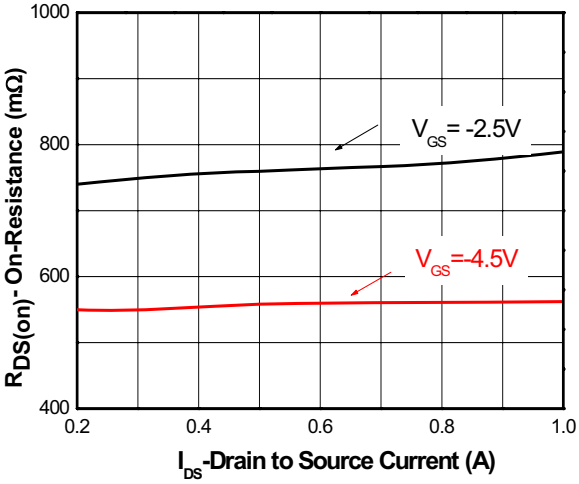
Typical Characteristics (Ta=25°C, unless otherwise noted)



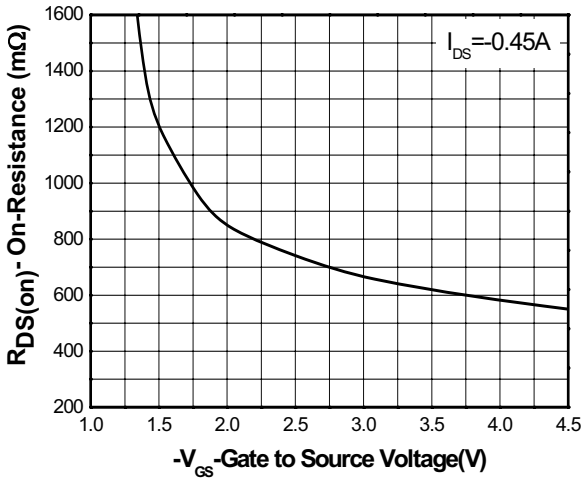
Output characteristics



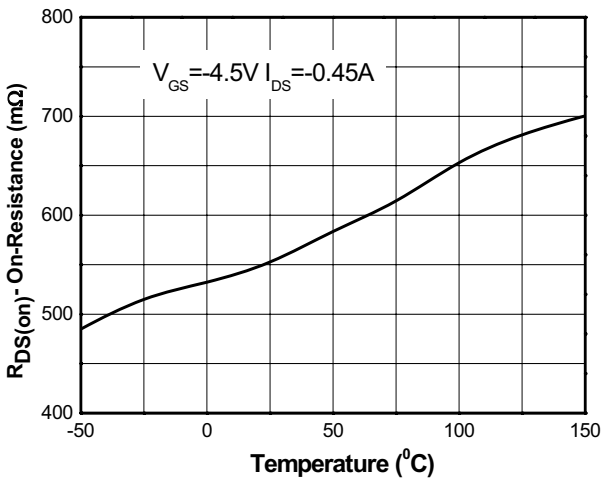
Transfer characteristics



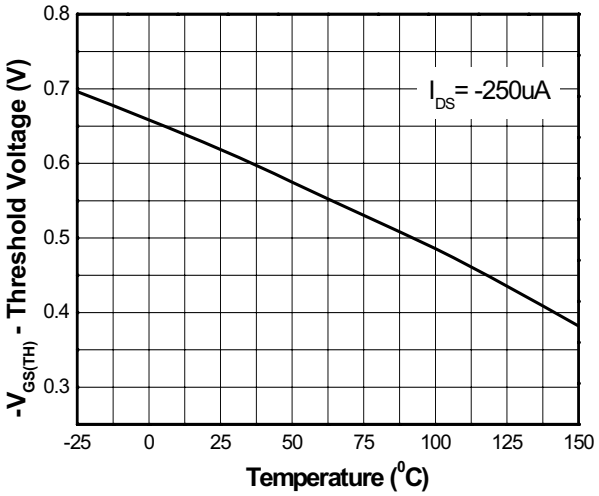
On-Resistance vs. Drain current



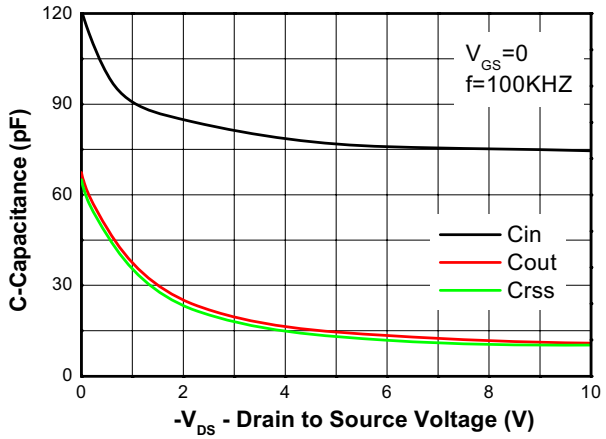
On-Resistance vs. Gate-to-Source voltage



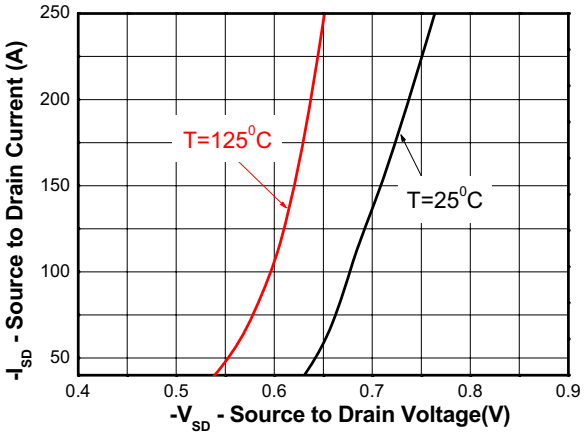
On-Resistance vs. Junction temperature



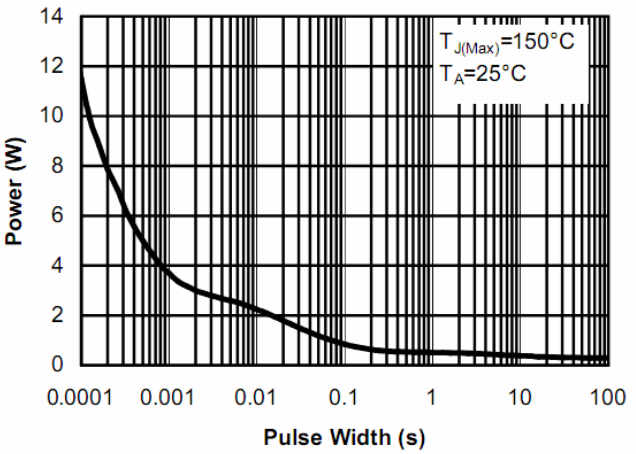
Threshold voltage vs. Temperature



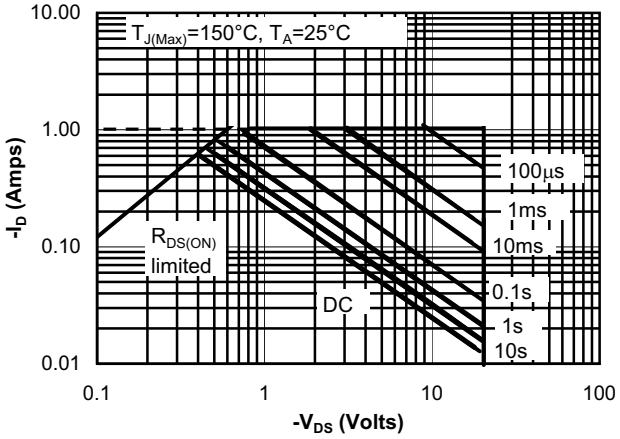
Capacitance



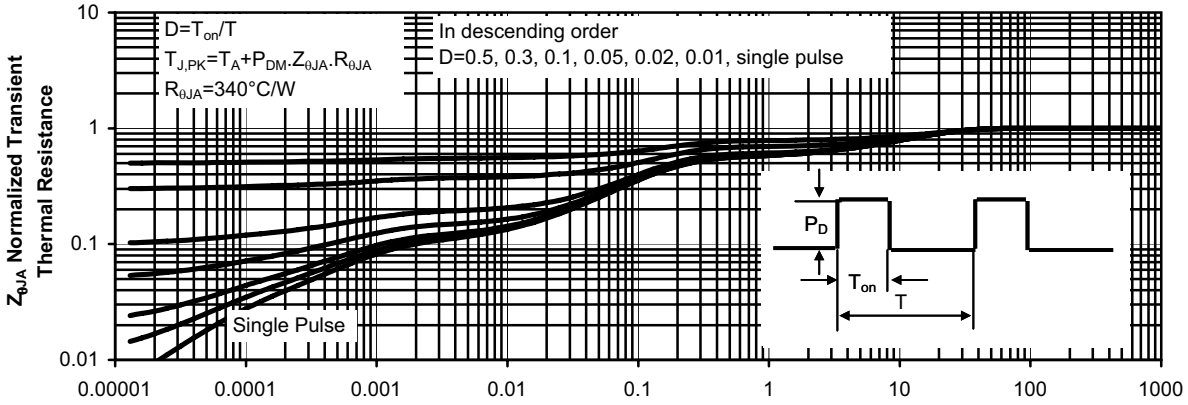
Body diode forward voltage



Single pulse power



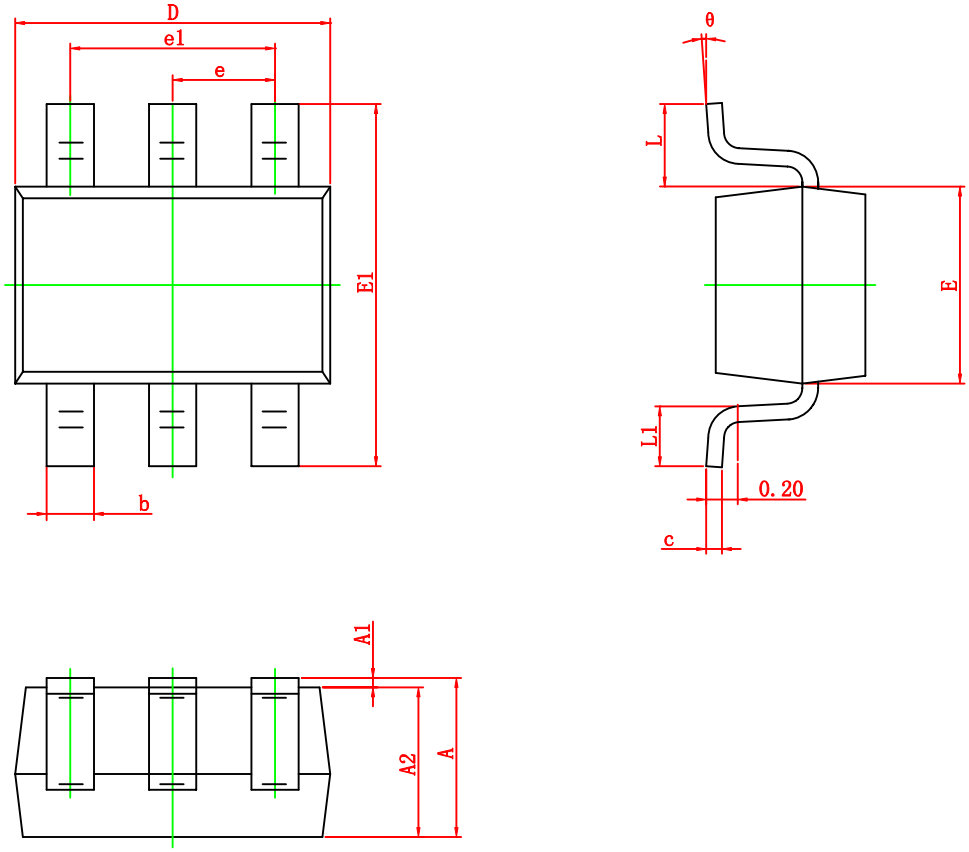
Safe operating power



Transient thermal response (Junction-to-Ambient)

Package outline dimensions

SOT-363



Symbol	Dimension in Millimeters	
	Min.	Max.
A	0.900	1.100
A1	0.000	0.100
A2	0.900	1.000
b	0.150	0.350
c	0.080	0.150
D	2.000	2.200
E	1.150	1.350
E1	2.150	2.450
e	0.650 TYP	
e1	1.200	1.400
L	0.525 REF	
L1	0.260	0.460
θ	0°	8°