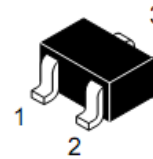
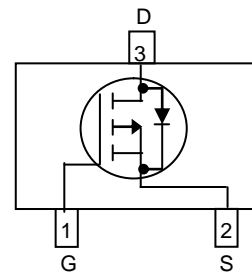


WPM3015
Single P-Channel, -30V, -3.1A, Power MOSFET
www.sh-willsemi.com

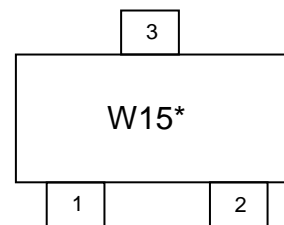
V_{DS} (V)	Typical $R_{DS(on)}$ (Ω)
-30	0.063 @ $V_{GS}=-10V$
	0.091 @ $V_{GS}=-4.5V$


TSOT-23-3L
Descriptions

The WPM3015 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 WPM3015 is Pb-free and Halogen-free.


Features

- Trench Technology
- Supper high density cell design
- Excellent ON resistance for higher DC current
- Extremely Low Threshold Voltage
- Small package TSOT-23-3L

Pin configuration (Top view)


W15= Device Code
* = Month

Applications

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

Marking
Order information

Device	Package	Shipping
WPM3015-3/TR	TSOT-23-3L	3000/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 ^{ad}	$T_A=25^\circ\text{C}$	I_D	-3.1	-2.6	A
	$T_A=70^\circ\text{C}$		-2.4	-2.1	
Maximum Power Dissipation ^{ad}	$T_A=25^\circ\text{C}$	P_D	1.0	0.8	W
	$T_A=70^\circ\text{C}$		0.6	0.5	
Continuous Drain Current ^{bd}	$T_A=25^\circ\text{C}$	I_D	-2.9	-2.5	A
	$T_A=70^\circ\text{C}$		-2.3	-2.0	
Maximum Power Dissipation ^{bd}	$T_A=25^\circ\text{C}$	P_D	0.9	0.7	W
	$T_A=70^\circ\text{C}$		0.6	0.4	
Pulsed Drain Current ^c		I_{DM}	-10		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	$t \leq 10$ s	$R_{\theta JA}$	95	115	$^\circ\text{C/W}$
	Steady State		120	155	
Junction-to-Ambient Thermal Resistance ^b	$t \leq 10$ s	$R_{\theta JA}$	115	130	
	Steady State		145	170	
Junction-to-Case Thermal Resistance		$R_{\theta JC}$	70	90	

a Surface mounted on FR-4 Board using 1 square inch pad size, 1oz copper

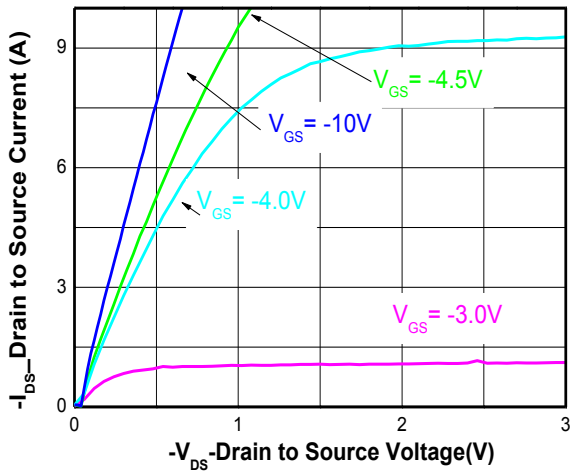
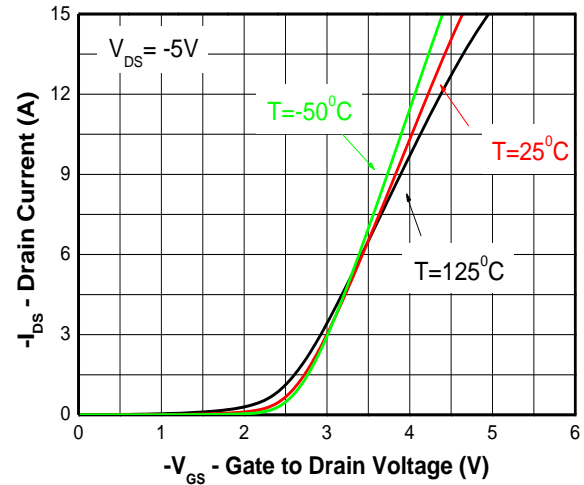
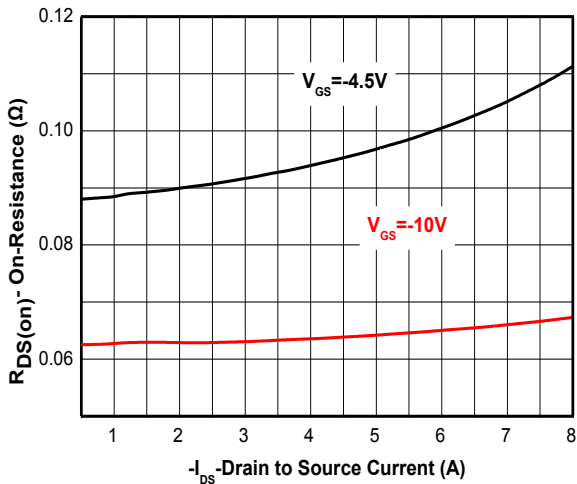
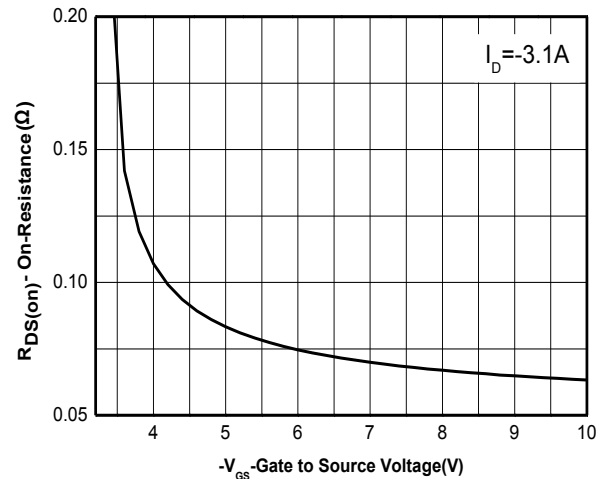
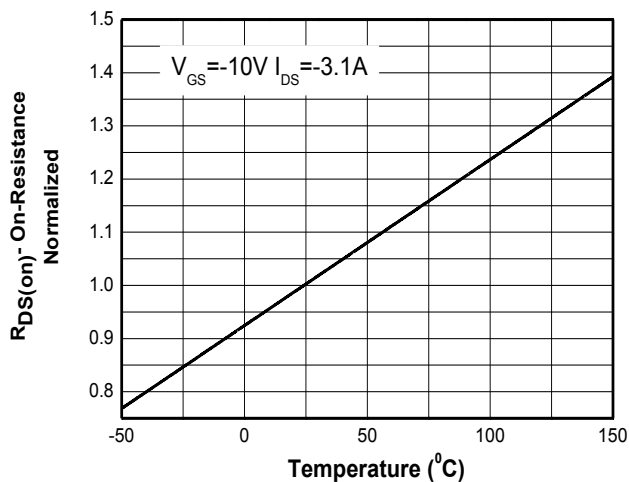
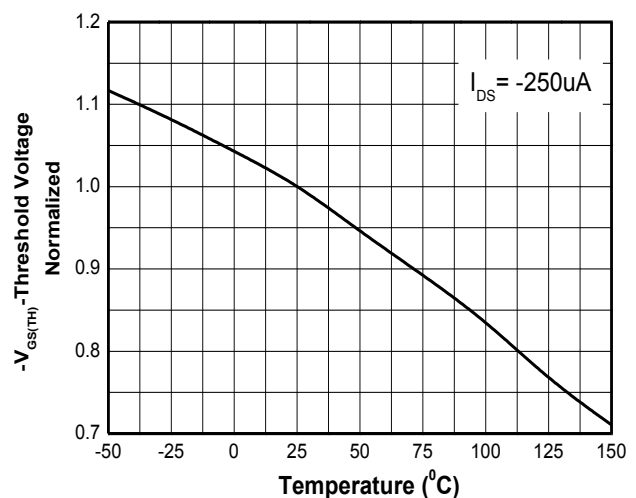
b Surface mounted on FR-4 board using minimum pad size, 1oz copper

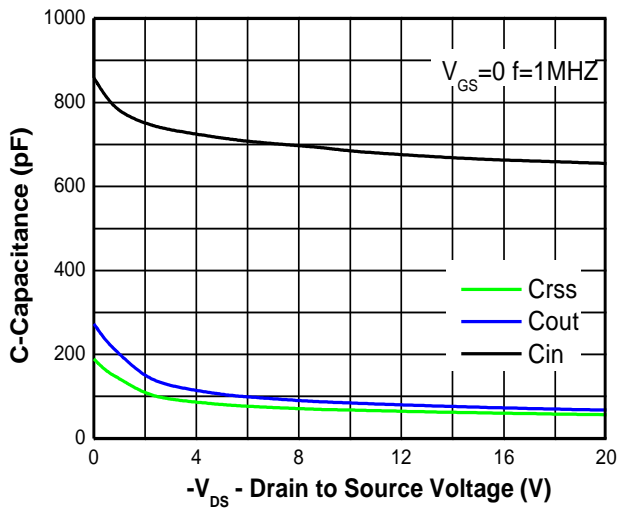
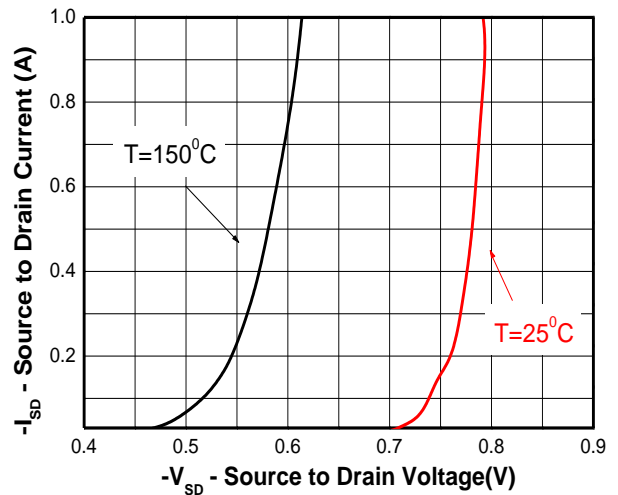
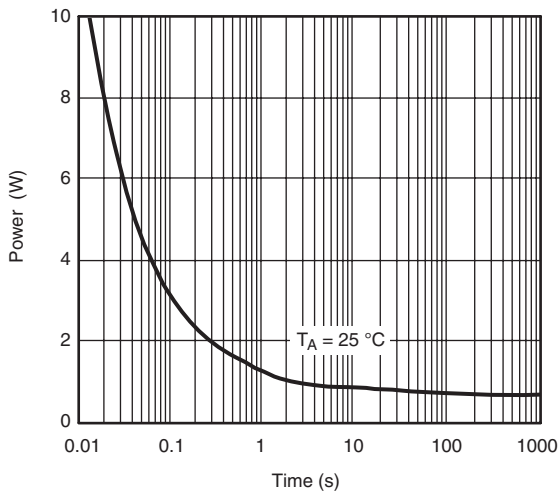
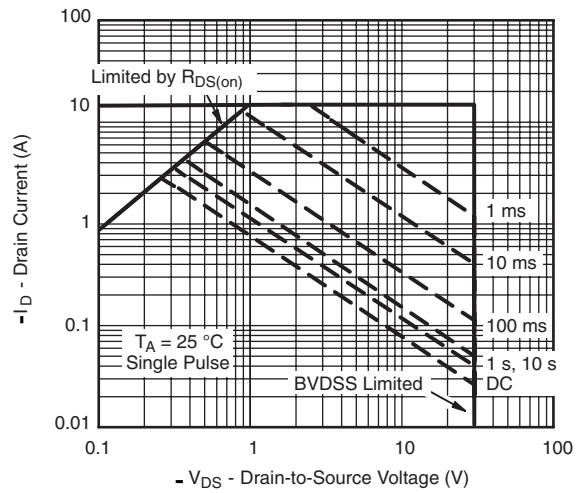
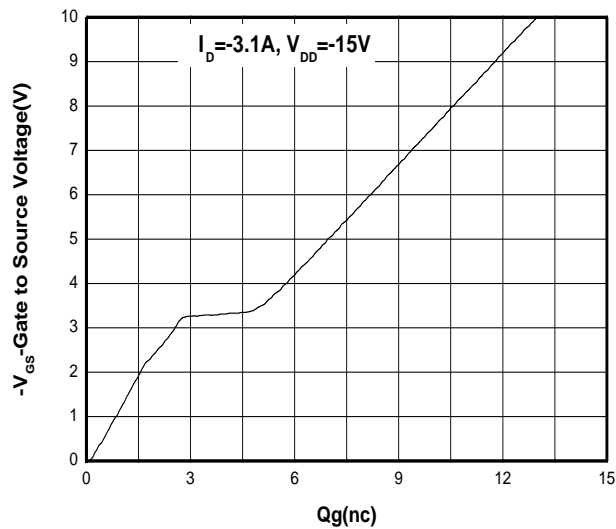
c Pulse width < 380us

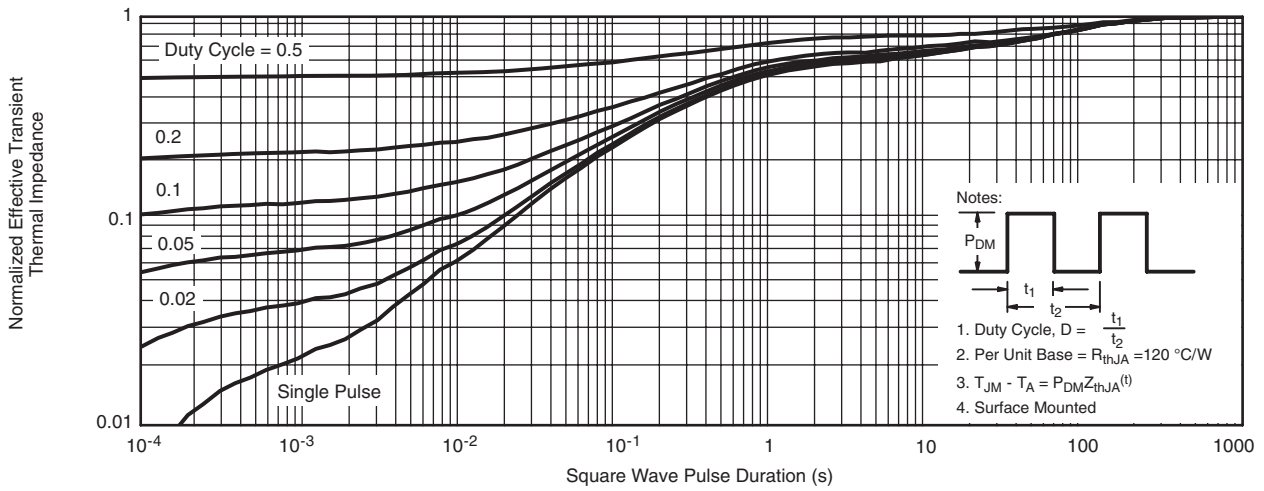
d Maximum junction temperature $T_J=150^\circ\text{C}$.

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

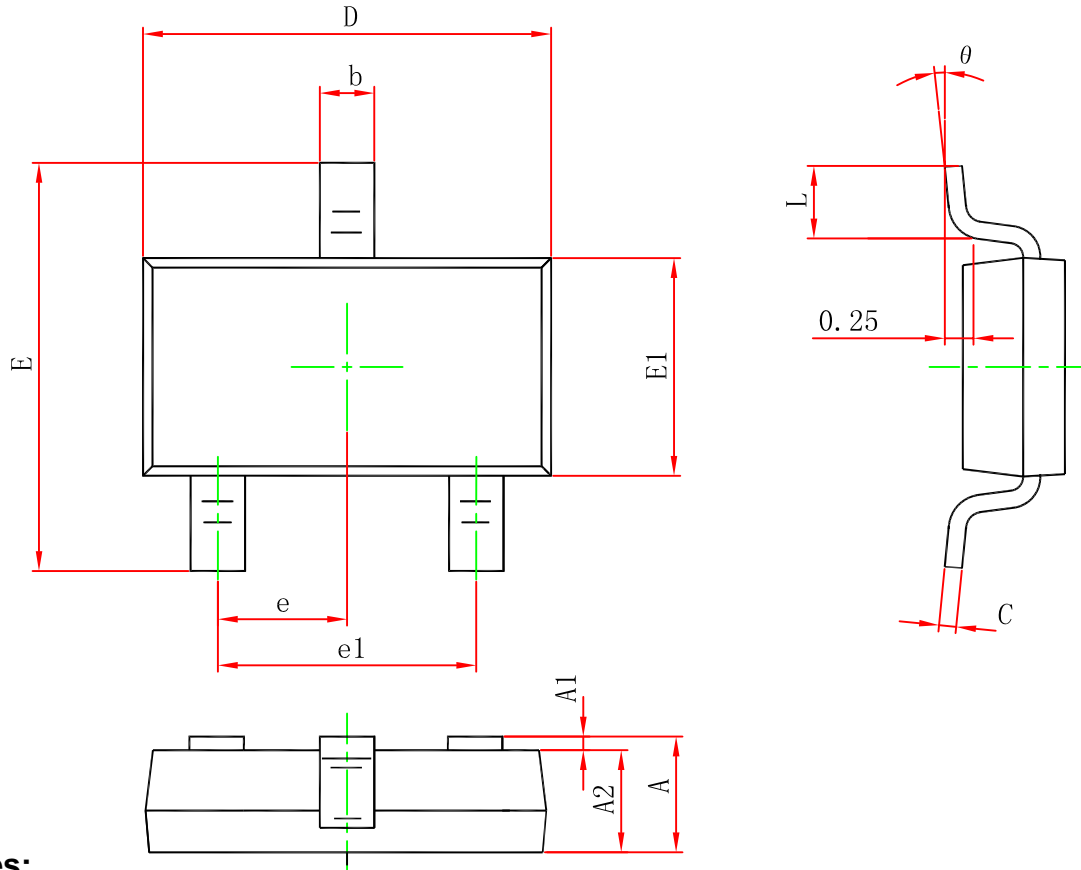
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Drain-to-Source Breakdown Voltage	BV_{DSS}	$V_{GS} = 0\text{ V}, I_D = -250\mu\text{A}$	-30			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = -24\text{V}, V_{GS} = 0\text{V}$			-1	μA
Gate-to-source Leakage Current	I_{GSS}	$V_{DS} = 0\text{ V}, V_{GS} = \pm 20\text{V}$			± 1	μA
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{GS} = V_{DS}, I_D = -250\mu\text{A}$	-1.0	-2.1	-2.5	V
Drain-to-source On-resistance ^c	$R_{DS(on)}$	$V_{GS} = -10\text{V}, I_D = -3.1\text{A}$		63	75	m Ω
		$V_{GS} = -4.5\text{V}, I_D = -2.8\text{A}$		91	112	
Forward Transconductance	g_{FS}	$V_{DS} = -5\text{ V}, I_D = -3.1\text{A}$		6.0		S
CAPACITANCES, CHARGES						
Input Capacitance	C_{ISS}	$V_{GS} = 0\text{ V},$ $f = 1.0\text{ MHz},$ $V_{DS} = -20\text{V}$		654		pF
Output Capacitance	C_{OSS}			67		
Reverse Transfer Capacitance	C_{RSS}			56		
Total Gate Charge	$Q_{G(TOT)}$	$V_{GS} = -10\text{ V},$ $V_{DD} = -15\text{V},$ $I_D = -3.1\text{A}$		12.9		nC
Threshold Gate Charge	$Q_{G(TH)}$			1.55		
Gate-to-Source Charge	Q_{GS}			2.75		
Gate-to-Drain Charge	Q_{GD}			2.03		
SWITCHING CHARACTERISTICS						
Turn-On Delay Time	$t_d(ON)$	$V_{GS} = -10\text{ V},$ $V_{DD} = -15\text{ V},$ $R_L = 5\Omega,$ $R_G = 15\Omega$		9.6		ns
Rise Time	t_r			4.0		
Turn-Off Delay Time	$t_d(OFF)$			34.8		
Fall Time	t_f			7.2		
BODY DIODE CHARACTERISTICS						
Forward Voltage	V_{SD}	$V_{GS} = 0\text{ V}, I_S = -1.0\text{A}$		-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)

Package outline dimensions
TSOT-23-3L

Notes:
All dimensions meet jedec standard MO-19 AA
Do not include mold flash or protrusions.

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	---	0.900	---	0.035
A1	0.000	0.100	0.000	0.004
A2	0.700	0.800	0.028	0.031
b	0.350	0.500	0.014	0.020
c	0.080	0.200	0.003	0.008
D	2.820	3.020	0.111	0.119
E1	1.600	1.700	0.063	0.067
E	2.650	2.950	0.104	0.116
e	0.95 (BSC)		0.037(BSC)	
e1	1.90 (BSC)		0.075(BSC)	
L	0.300	0.600	0.012	0.024
theta	0°	8°	0°	8°