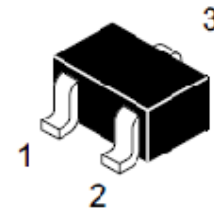


WPM1488

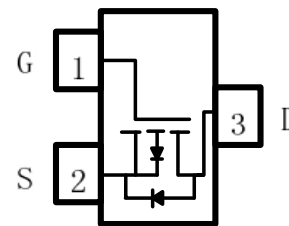
Single P-Channel, -12V, -1.4A, Power MOSFET

www.sh-willsemi.com

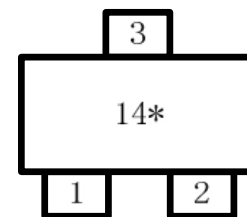
V _{DS} (V)	Typical R _{ds(on)} (Ω)	I _D (A)
-12	0.080@ V _{GS} = - 4.5V	-1.2
	0.086@ V _{GS} = - 3.6V	-1.0
	0.105@ V _{GS} = - 2.5V	-1.0



SOT-323



Pin configuration (Top view)



14 = Specific Device Code

* = Date Code

Marking

Order information

Device	Package	Shipping
WPM1488-3/TR	SOT-323	3000/Reel&Tape

Descriptions

The WPM1488 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 WPM1488 is Pb-free.

Features

- Trench Technology
- Supper high density cell design
- Excellent ON resistance for higher DC current
- Extremely Low Threshold Voltage
- Small package SOT-323

Applications

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

Absolute Maximum ratings

Parameter		Symbol	10 S	Steady State	Unit
Drain-Source Voltage		V_{DS}	-12		V
Gate-Source Voltage		V_{GS}	± 8		
Continuous Drain Current ^{a d}	$T_A=25^\circ\text{C}$	I_D	-1.5	-1.4	A
	$T_A=70^\circ\text{C}$		-1.2	-1.1	
Maximum Power Dissipation ^{a d}	$T_A=25^\circ\text{C}$	P_D	0.44	0.38	W
	$T_A=70^\circ\text{C}$		0.28	0.25	
Continuous Drain Current ^{b d}	$T_A=25^\circ\text{C}$	I_D	-1.4	-1.3	A
	$T_A=70^\circ\text{C}$		-1.1	-1.1	
Maximum Power Dissipation ^{b d}	$T_A=25^\circ\text{C}$	P_D	0.39	0.34	W
	$T_A=70^\circ\text{C}$		0.25	0.22	
Pulsed Drain Current ^c		I_{DM}	-10		A
Operating Junction Temperature		T_J	-55 to 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 10 s	R_{JA}	284	335	$^\circ\text{C/W}$
	Steady State		321	385	
Junction-to-Ambient Thermal Resistance ^b	t 10 s	R_{JA}	315	338	
	Steady State		358	415	
Junction-to-Case Thermal Resistance	Steady State	R_{JC}	110	165	

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

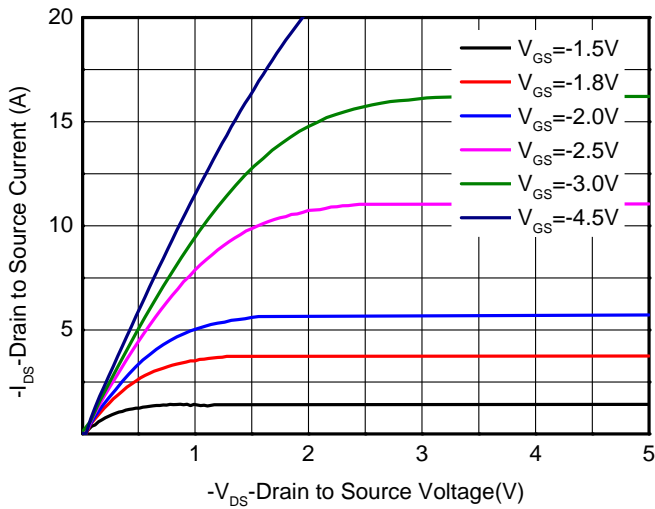
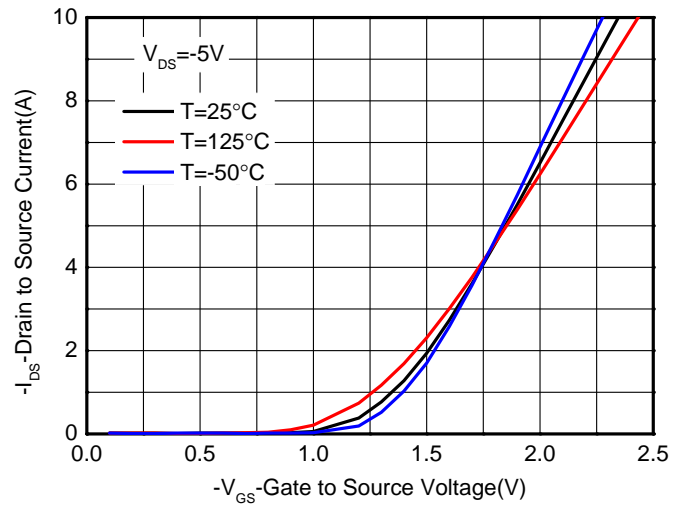
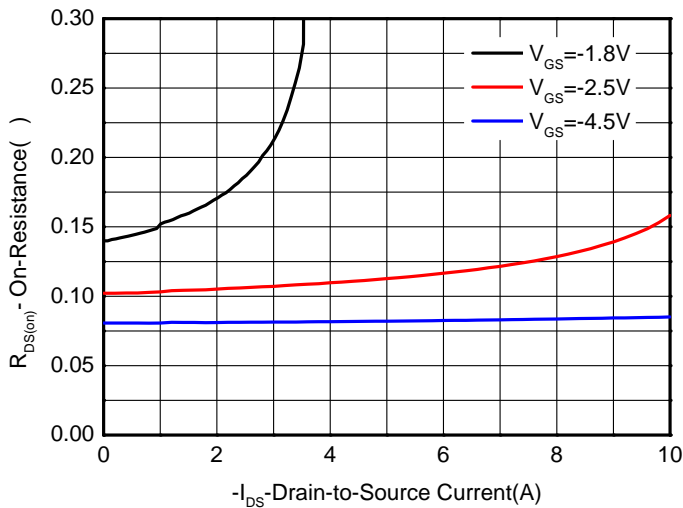
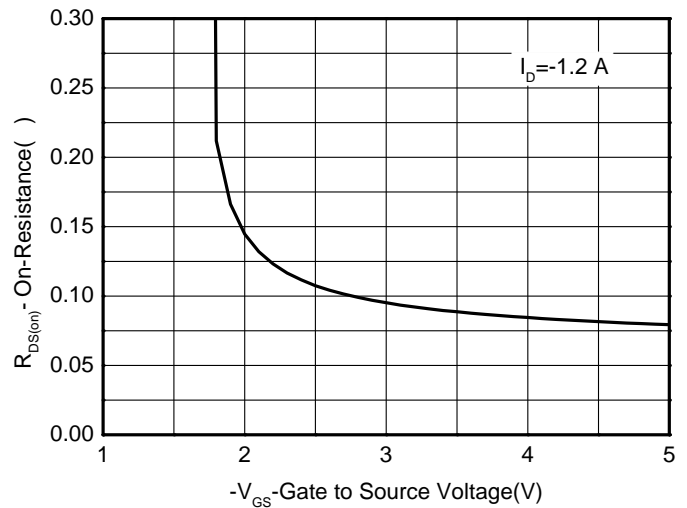
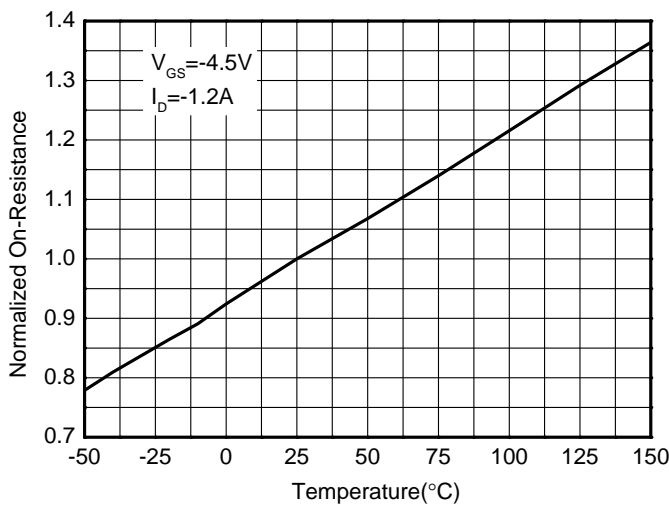
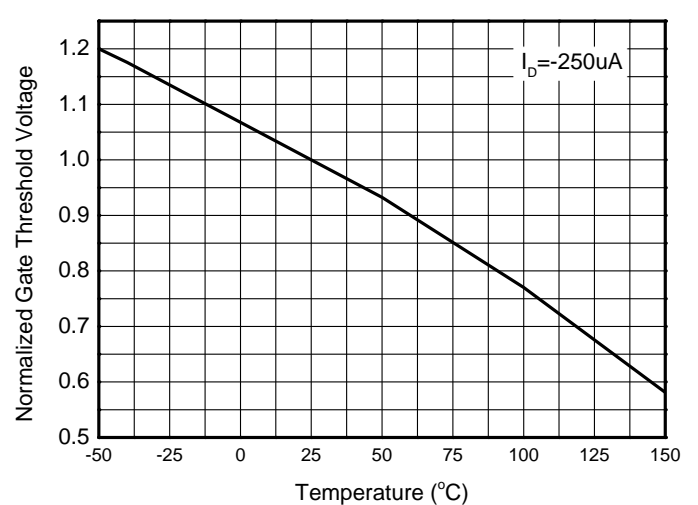
b Surface mounted on FR-4 board using minimum pad size, 1oz copper

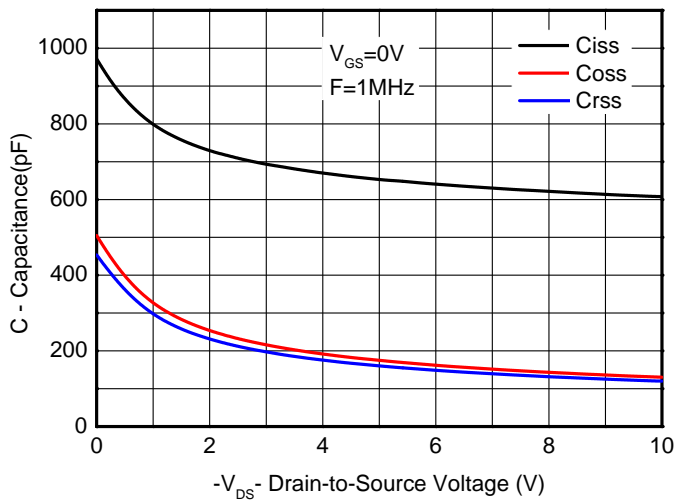
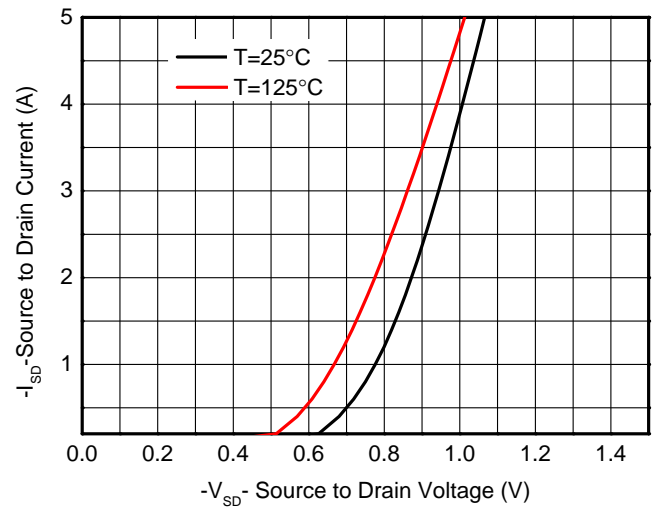
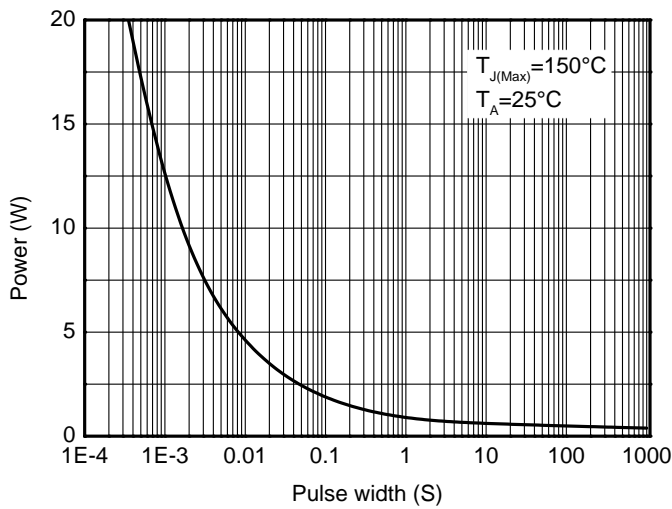
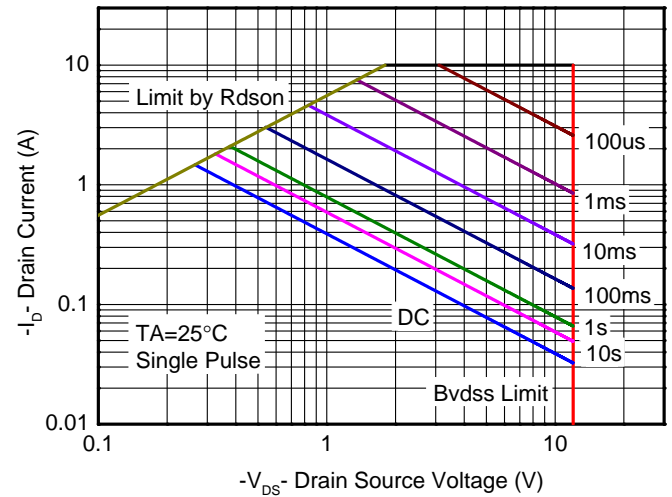
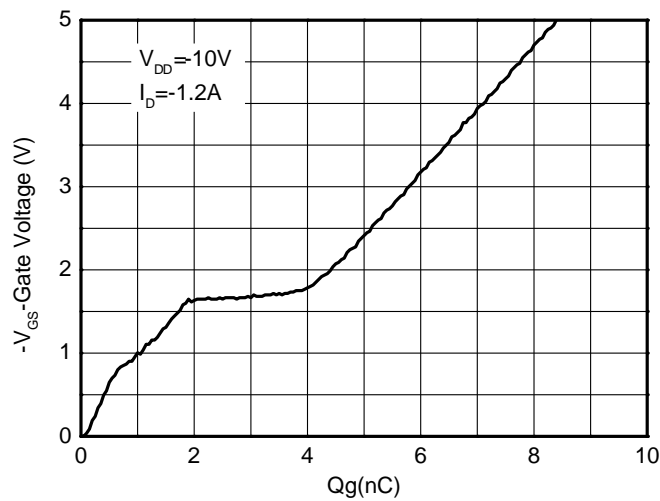
c Pulse width<380 μs , Duty Cycle<2%

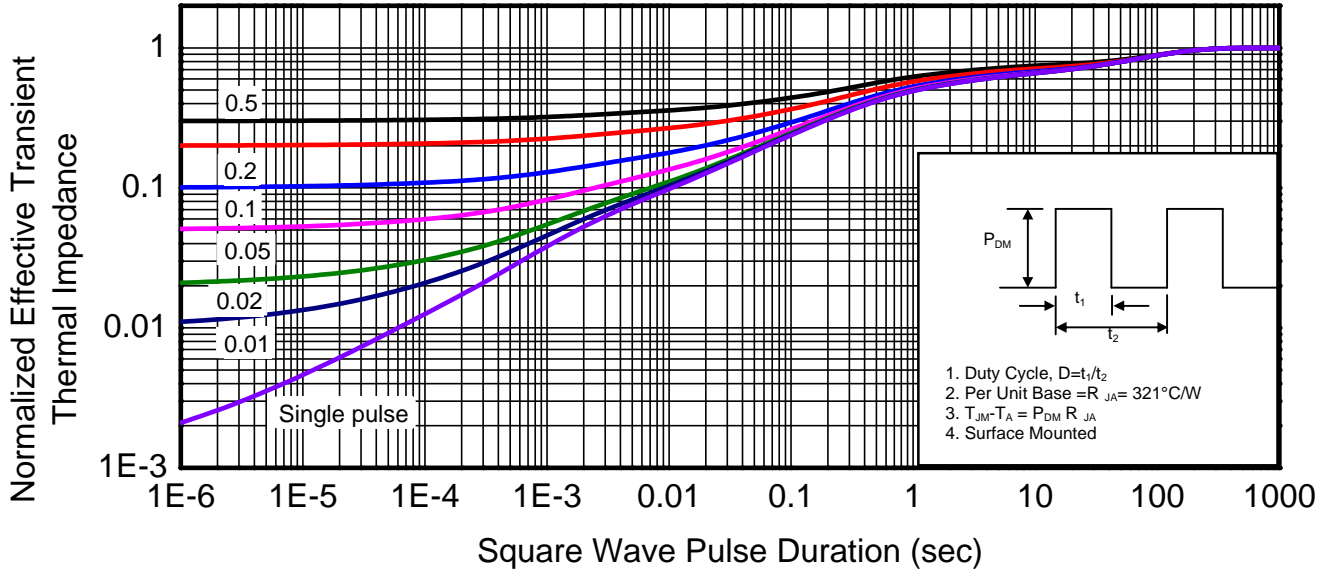
d Maximum junction temperature $T_J=150^\circ\text{C}$.

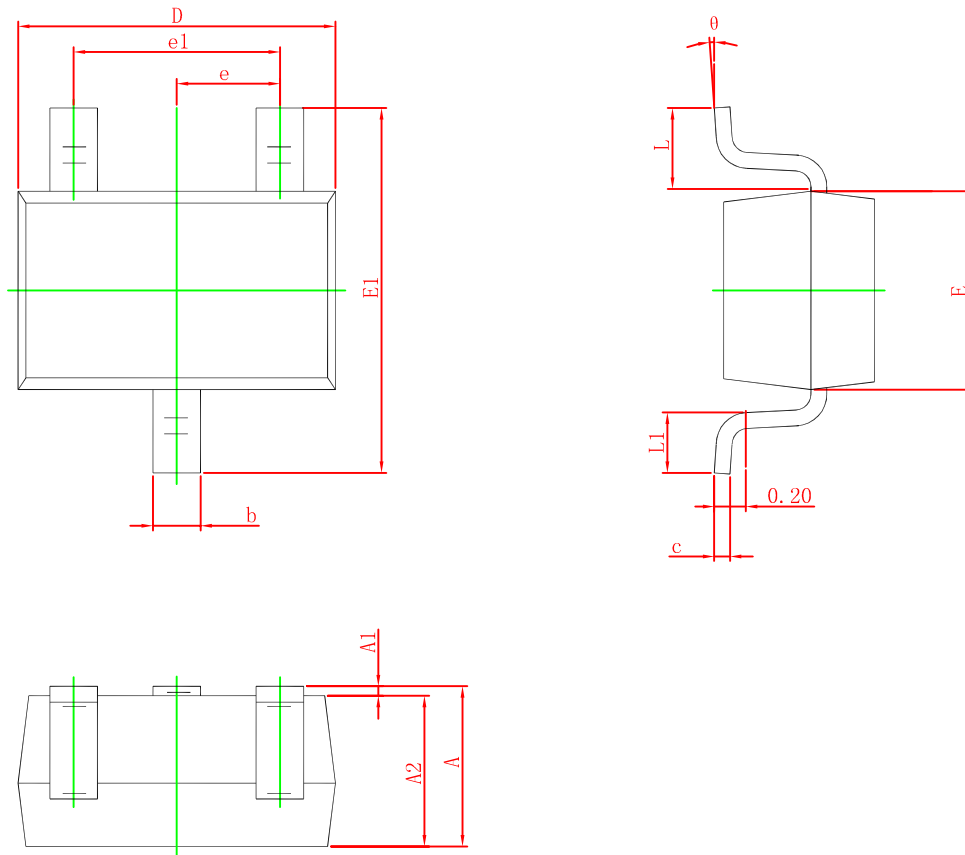
Electronics Characteristics (Ta=25°C, unless otherwise noted)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Drain-to-Source Breakdown Voltage	BV_{DSS}	$V_{GS} = 0\text{ V}, I_D = -250\mu\text{A}$	-12			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = -10\text{V}, V_{GS} = 0\text{V}$			-1	μA
Gate-to-source Leakage Current	I_{GSS}	$V_{DS} = 0\text{ V}, V_{GS} = \pm 8\text{V}$			± 1	μA
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{GS} = V_{DS}, I_D = -250\mu\text{A}$	-0.45	-0.65	-0.85	V
Drain-to-source On-resistance ^{b, c}	$R_{DS(on)}$	$V_{GS} = -4.5\text{V}, I_D = -1.2\text{A}$		80	120	m Ω
		$V_{GS} = -3.6\text{V}, I_D = -1.0\text{A}$		86	140	
		$V_{GS} = -2.5\text{V}, I_D = -1.0\text{A}$		105	160	
Forward Transconductance	g_{FS}	$V_{DS} = -5\text{V}, I_D = -1.2\text{A}$		9		S
CAPACITANCES, CHARGES						
Input Capacitance	C_{ISS}	$V_{GS} = 0\text{ V},$ $f = 1.0\text{ MHz},$ $V_{DD} = -10\text{ V}$		607		pF
Output Capacitance	C_{OSS}			130		
Reverse Transfer Capacitance	C_{RSS}			120		
Total Gate Charge	$Q_{G(TOT)}$	$V_{GS} = -4.5\text{ V},$ $V_{DD} = -10\text{ V},$ $I_D = -1.2\text{A}$		7.85		nC
Threshold Gate Charge	$Q_{G(TH)}$			0.85		
Gate-to-Source Charge	Q_{GS}			1.9		
Gate-to-Drain Charge	Q_{GD}			2.1		
SWITCHING CHARACTERISTICS						
Turn-On Delay Time	$t_{d(on)}$	$V_{GS} = -4.5\text{ V},$ $V_{DD} = -10\text{V},$ $I_D = -1.2\text{A},$ $R_G = 6\ \Omega$		30		ns
Rise Time	t_r			32		
Turn-Off Delay Time	$t_{d(off)}$			62		
Fall Time	t_f			18		
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
SOT-323


Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.100	0.035	0.043
A1	0.000	0.100	0.000	0.004
A2	0.900	1.000	0.035	0.039
b	0.200	0.400	0.008	0.016
c	0.080	0.150	0.003	0.006
D	2.000	2.200	0.079	0.087
E	1.150	1.350	0.045	0.053
E1	2.150	2.450	0.085	0.096
e	0.650 TYP.		0.026 TYP.	
e1	1.200	1.400	0.047	0.055
L	0.525 REF.		0.021 REF.	
L1	0.260	0.460	0.010	0.018
θ	0°	8°	0°	8°

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