

WPM1481
Single P-Channel, -12V, -5.5A, Power MOSFET
[Http://www.sh-willsemi.com](http://www.sh-willsemi.com)

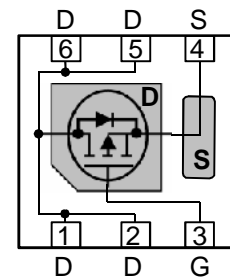
V _{DS} (V)	Typical R _{ds(on)} ()	I _D (A)
-12	0.022 @ V _{GS} =-4.5V	-5.5
	0.030 @ V _{GS} =-2.5V	-4.0
	0.045 @ V _{GS} =-1.8V	-2.5



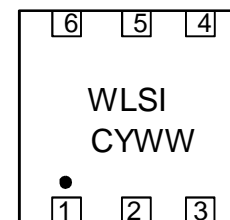
DFN2*2-6L

Descriptions

The WPM1481 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 WPM1481 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 DFN2*2-6L



WLSI = Company Code
 C = Device Code
 Y = 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
WPM1481- 6/TR	DFN2*2-6L	3000/Reel&Tape

Absolute Maximum ratings

Parameter		Symbol	10 S	Steady State	Unit
Drain-Source Voltage		V_{DS}	-12		V
Gate-Source Voltage		V_{GS}	± 12		
Continuous Drain Current ^{a d}	$T_A=25^\circ\text{C}$	I_D	-5.1	-4.3	A
	$T_A=70^\circ\text{C}$		-4.0	-3.4	
Maximum Power Dissipation ^{a d}	$T_A=25^\circ\text{C}$	P_D	1.9	1.4	W
	$T_A=70^\circ\text{C}$		1.2	0.9	
Continuous Drain Current ^{b d}	$T_A=25^\circ\text{C}$	I_D	-3.7	-3.0	A
	$T_A=70^\circ\text{C}$		-3.0	-2.4	
Maximum Power Dissipation ^{b d}	$T_A=25^\circ\text{C}$	P_D	1.0	0.6	W
	$T_A=70^\circ\text{C}$		0.6	0.4	
Pulsed Drain Current ^c		I_{DM}	-24		A
Operating Junction Temperature		T_J	-55~150		$^\circ\text{C}$
Lead Temperature		T_L	260		$^\circ\text{C}$
Storage Temperature Range		T_{stg}	-55 ~150		$^\circ\text{C}$

Thermal resistance ratings

Parameter		Symbol	Typical	Maximum	Unit
Junction-to-Ambient Thermal Resistance ^a	t 10 s	R_{JA}	49	64	$^\circ\text{C/W}$
	Steady State		66	88	
Junction-to-Ambient Thermal Resistance ^b	t 10 s	R_{JA}	84	118	
	Steady State		125	180	
Junction-to-Case Thermal Resistance		R_{JC}	32	42	

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

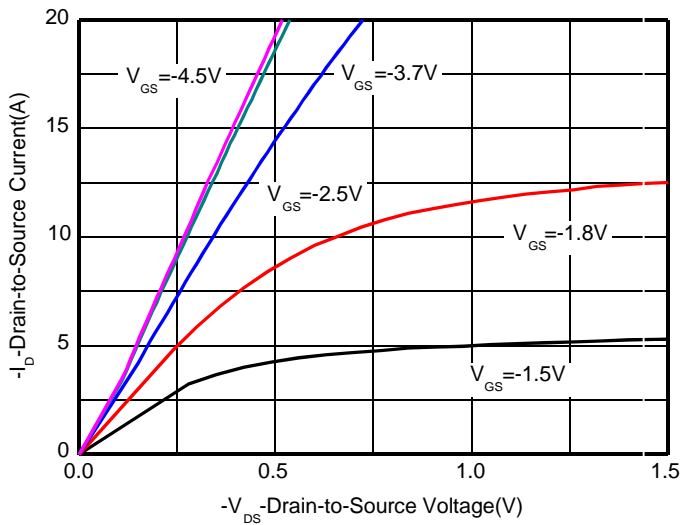
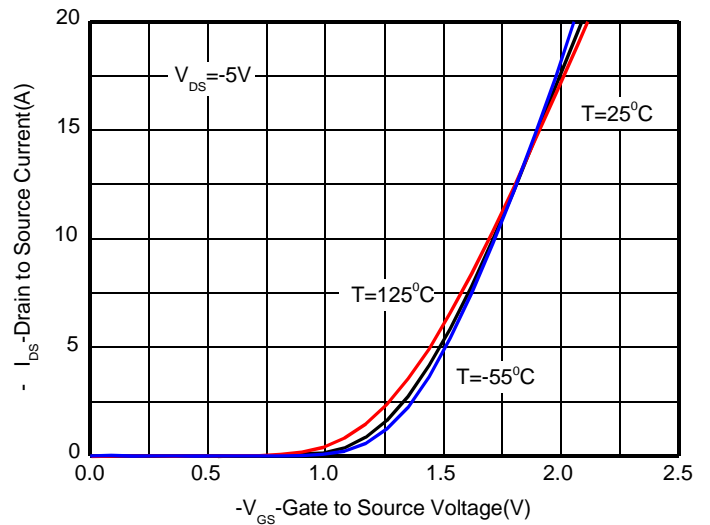
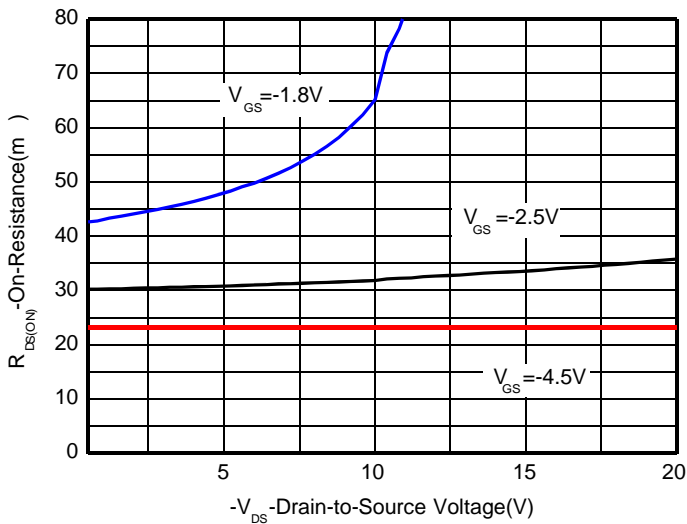
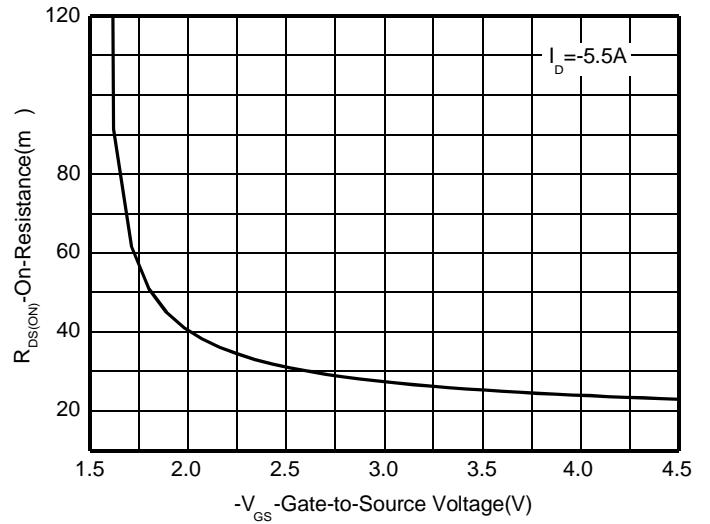
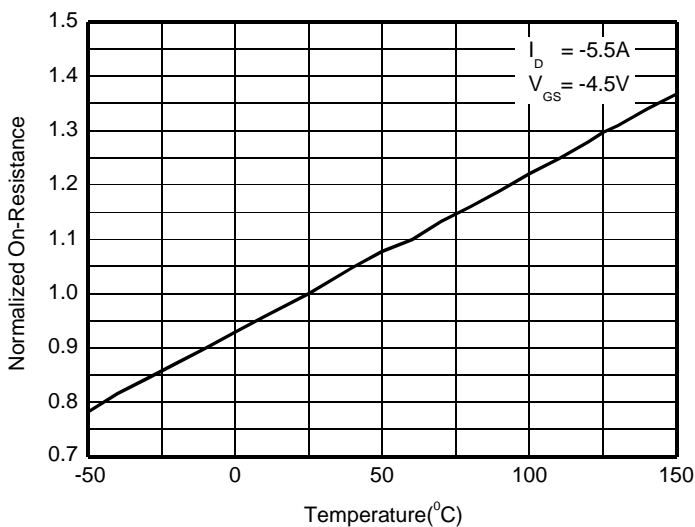
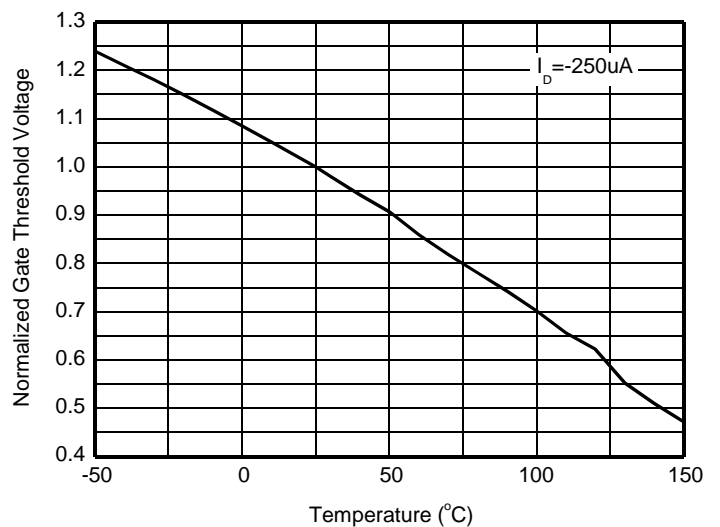
c Pulse width < 380 μs , Single pulse

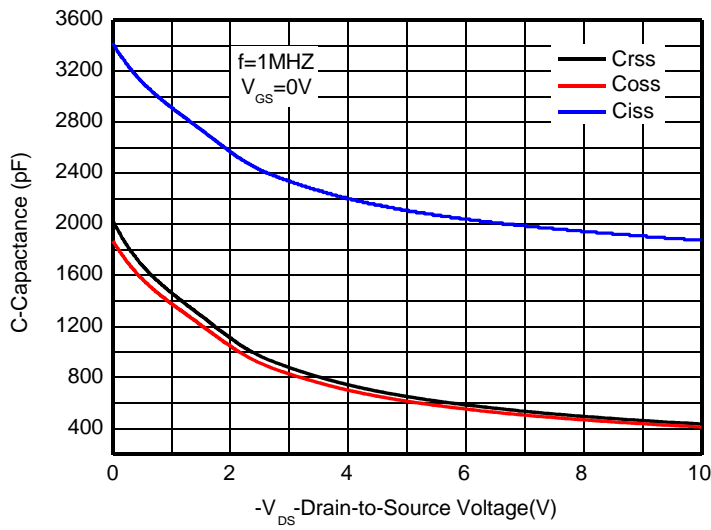
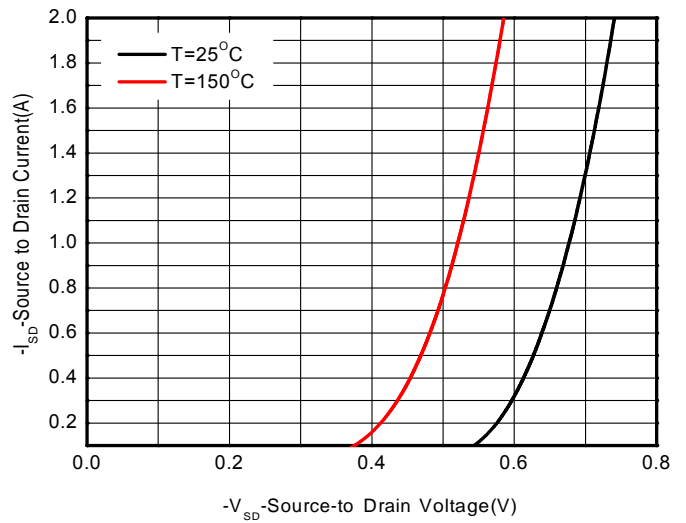
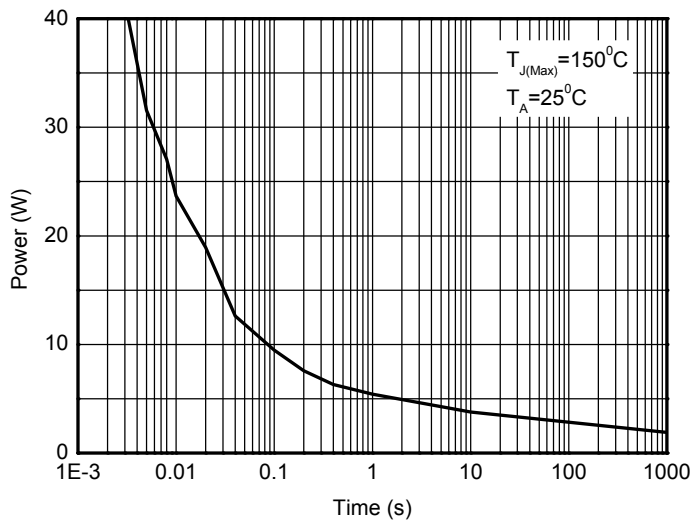
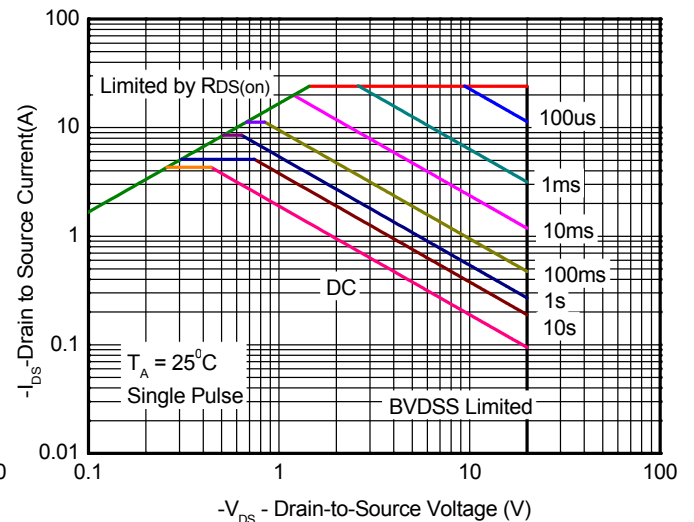
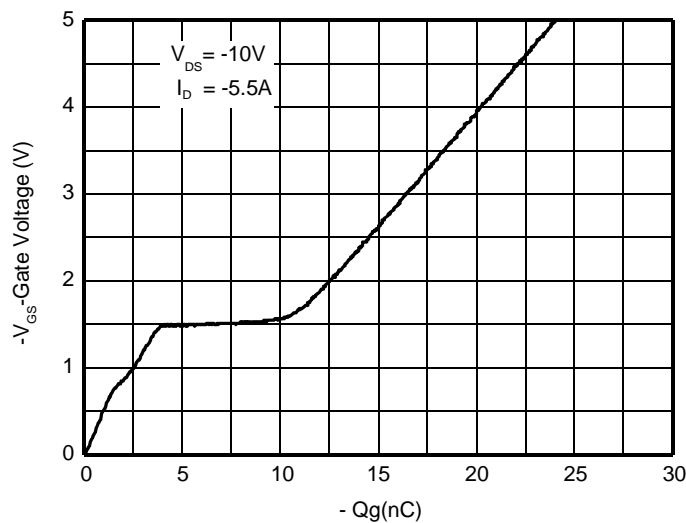
d Maximum junction temperature $T_J=150^\circ\text{C}$.

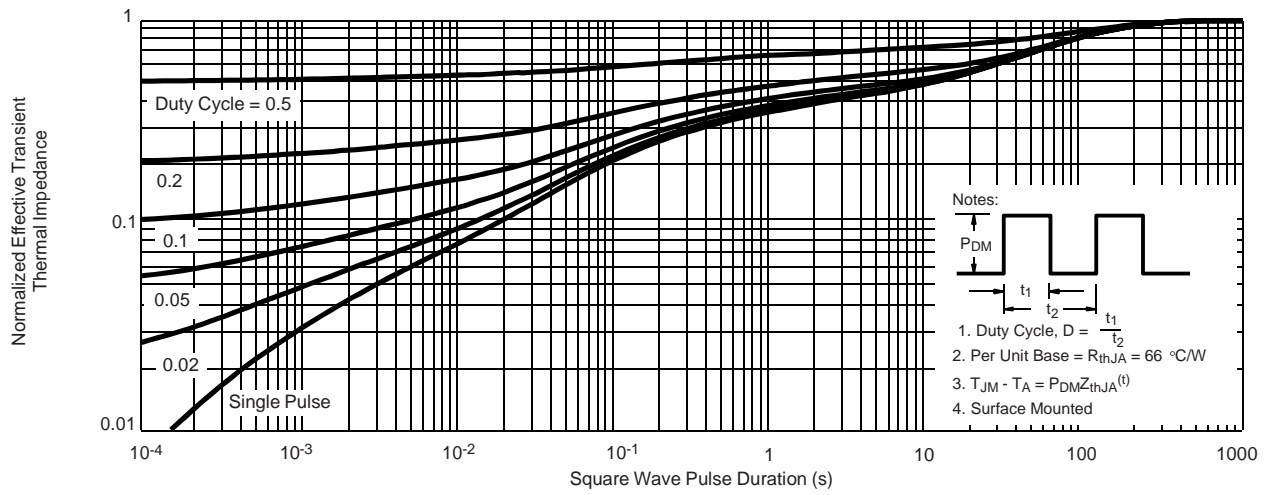
e Pulse test: Pulse width < 380 us duty cycle < 2%.

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

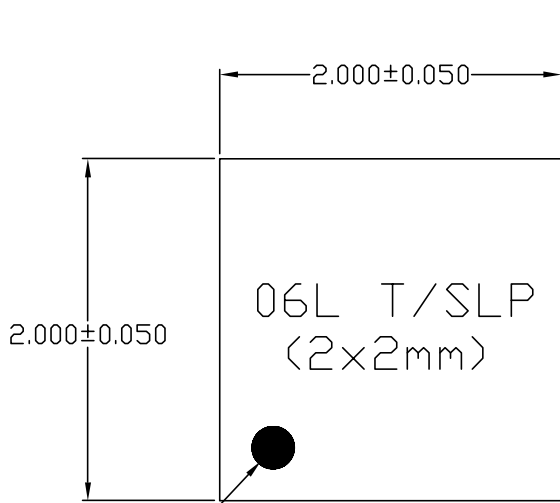
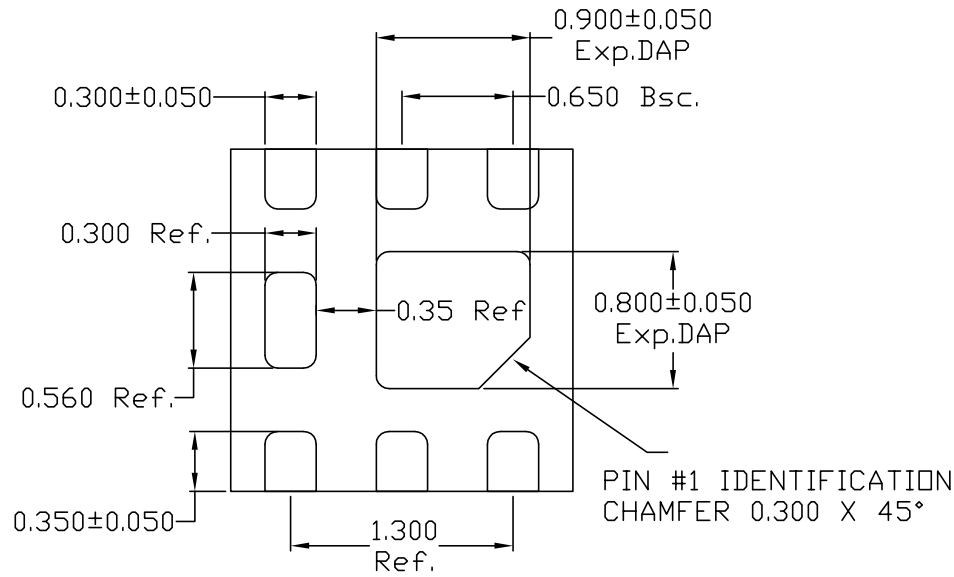
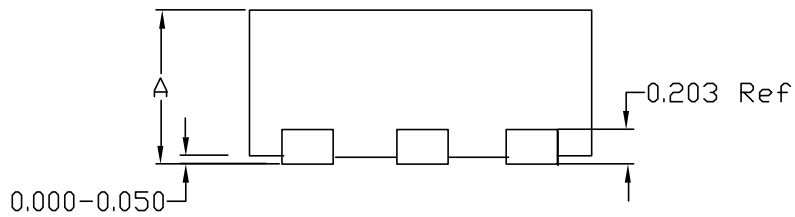
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Drain-to-Source Breakdown Voltage	BV _{DSS}	V _{GS} = 0 V, I _D = -250uA	-12			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = -10V, V _{GS} = 0V			-1	uA
Gate-to-source Leakage Current	I _{GSS}	V _{DS} = 0 V, V _{GS} = ±10V			±100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	V _{GS(TH)}	V _{GS} = V _{DS} , I _D = -250uA	-0.4		-0.9	V
Drain-to-source On-resistance ^{b, e}	R _{DS(on)}	V _{GS} = -4.5V, I _D = -5.5A		22	26	m
		V _{GS} = -2.5V, I _D = -4.0A		30	38	
		V _{GS} = -1.8V, I _D = -2.5A		45	59	
Forward Transconductance ^e	g _{FS}	V _{DS} = -5.0V, I _D = -5.5A		23		S
CAPACITANCES, CHARGES						
Input Capacitance	C _{ISS}	V _{GS} = 0 V,		1880		pF
Output Capacitance	C _{OSS}	f = 1.0 MHz,		437		
Reverse Transfer Capacitance	C _{RSS}	V _{DS} = -10 V		413		
Total Gate Charge	Q _{G(TOT)}	V _{GS} = -4.5 V, V _{DS} = -10 V, I _D = -5.5A		44.5		nC
Threshold Gate Charge	Q _{G(TH)}			3.5		
Gate-to-Source Charge	Q _{GS}			1.7		
Gate-to-Drain Charge	Q _{GD}			9.25		
SWITCHING CHARACTERISTICS						
Turn-On Delay Time	td _(ON)	V _{GS} = -4.5 V,		33.6		ns
Rise Time	tr	V _{DS} = -6 V,		35.6		
Turn-Off Delay Time	td _(OFF)	R _L =3 ,		50		
Fall Time	tf	R _G =6		63		
BODY DIODE CHARACTERISTICS						
Forward Voltage	V _{SD}	V _{GS} = 0 V, I _S = 1.0A		-0.76	-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
DFN2*2-6L

Top view

Bottom view

Side View
NOTE:

1) TSLP AND SLP SHARE THE SAME EXPOSE OUTLINE BUT WITH DIFFERENT THICKNESS:

		TSLP	SLP
A	MAX.	0.800	0.900
	NOM.	0.750	0.850
	MIN.	0.700	0.800