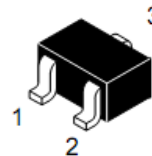


**Single P-Channel, -12V,-3.5A, Power MOSFET**

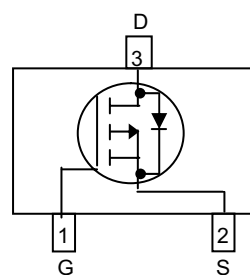
V <sub>DS</sub> (V)	R <sub>ds(on)</sub> (Ω)
-12	0.032@ V <sub>GS</sub> = - 4.5V
	0.046@ V <sub>GS</sub> = - 2.5V
	0.071@ V <sub>GS</sub> = - 1.8V



**SOT23-3L**

**Descriptions**

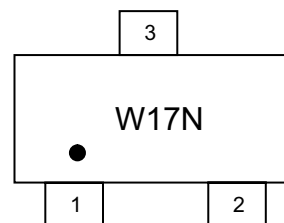
The WPM1487 is P-Channel enhancement MOS Field Effect Transistor. Uses advanced trench technology and design to provide excellent R<sub>DS (ON)</sub> with low gate charge. This device is suitable for use in DC-DC conversion, power switch and charging circuit. Standard Product WPM1487 is Pb-free and Halogen-free.



**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 SOT-23-3L



W = Willsemi  
 17=Device Code  
 N = Month (A~Z)

**Marking**

**Applications**

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

**Order information**

Device	Package	Shipping
WPM1487-3/TR	SOT-23-3L	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 <sup>a</sup>	$T_A=25^{\circ}C$	$I_D$	-3.5	-3.0	A
	$T_A=70^{\circ}C$		-2.7	-2.5	
Maximum Power Dissipation <sup>a</sup>	$T_A=25^{\circ}C$	$P_D$	1.0	0.8	W
	$T_A=70^{\circ}C$		0.6	0.5	
Continuous Drain Current <sup>b</sup>	$T_A=25^{\circ}C$	$I_D$	-3.0	-2.7	A
	$T_A=70^{\circ}C$		-2.5	-2.2	
Maximum Power Dissipation <sup>b</sup>	$T_A=25^{\circ}C$	$P_D$	0.8	0.6	W
	$T_A=70^{\circ}C$		0.5	0.4	
Pulsed Drain Current <sup>c</sup>		$I_{DM}$	-10		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**

Parameter		Symbol	Typical	Maximum	Unit
Junction-to-Ambient Thermal Resistance <sup>a</sup>	$t \leq 10$ s	$R_{\theta JA}$	100	125	°C/W
	Steady State		115	150	
Junction-to-Ambient Thermal Resistance <sup>b</sup>	$t \leq 10$ s	$R_{\theta JA}$	125	155	
	Steady State		140	185	
Junction-to-Case Thermal Resistance		$R_{\theta JC}$	60	75	

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

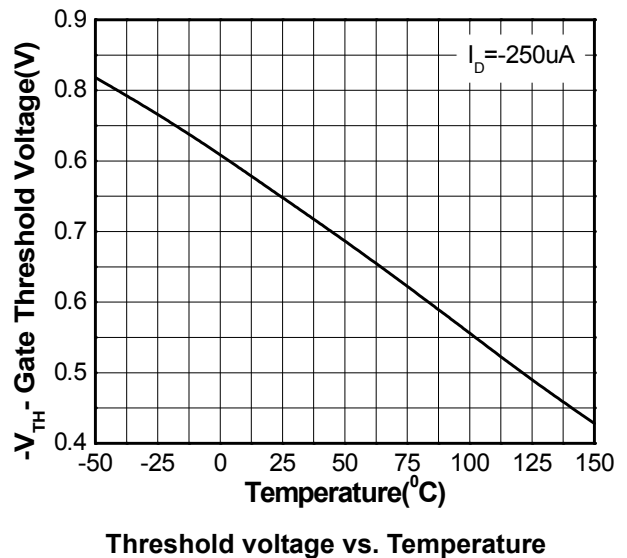
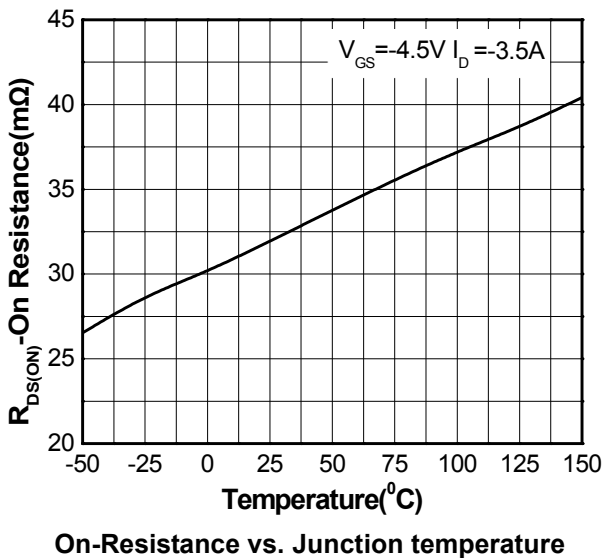
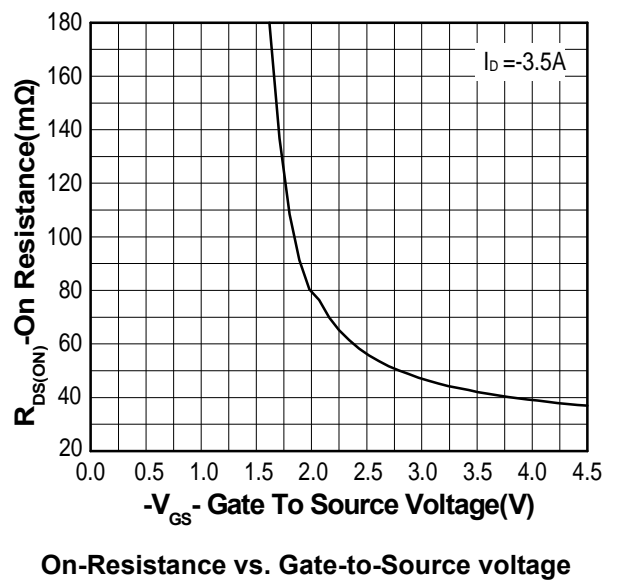
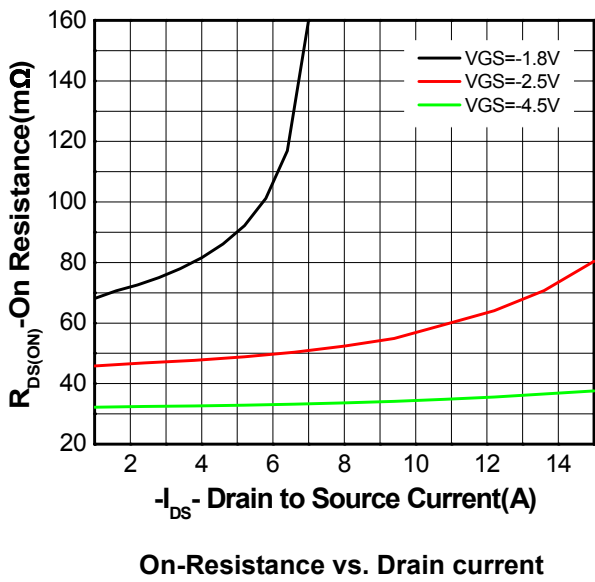
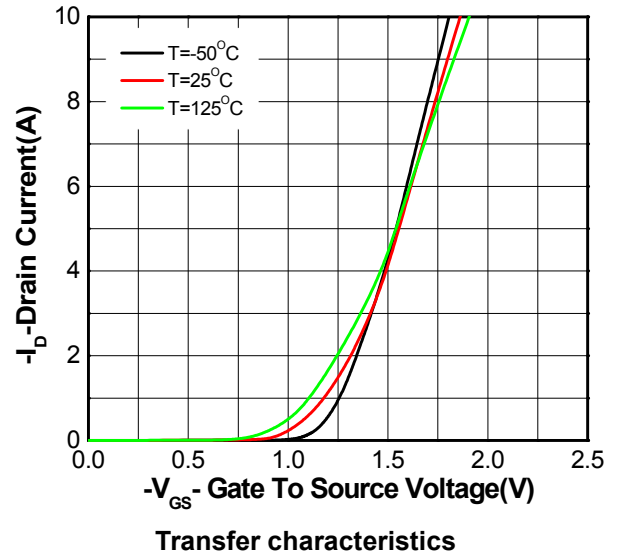
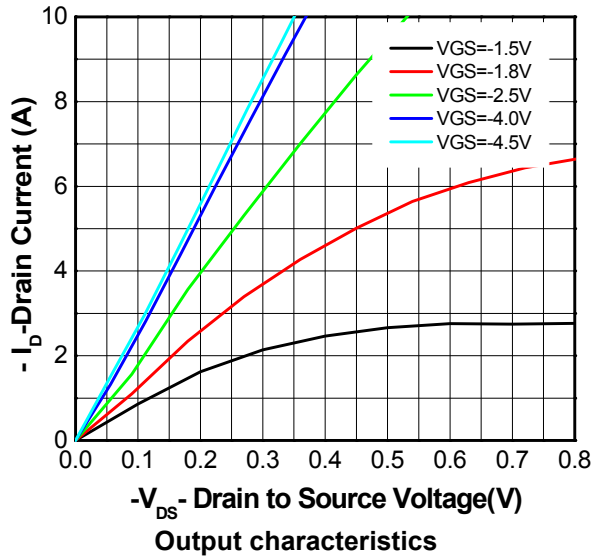
c Pulse width<380µs, Duty Cycle<2%

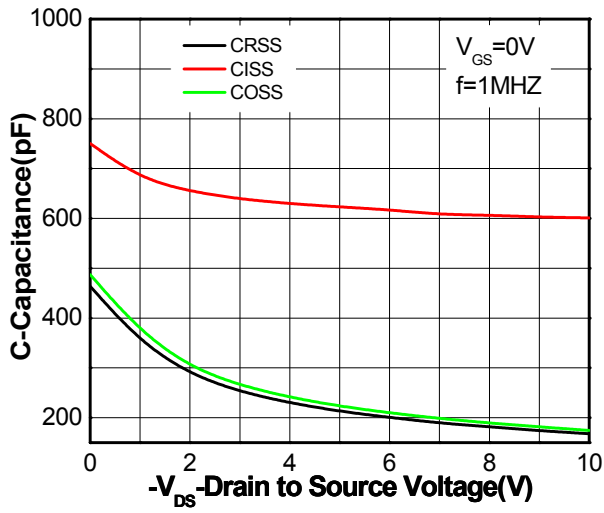
d Maximum junction temperature  $T_J=150^{\circ}C$ .

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

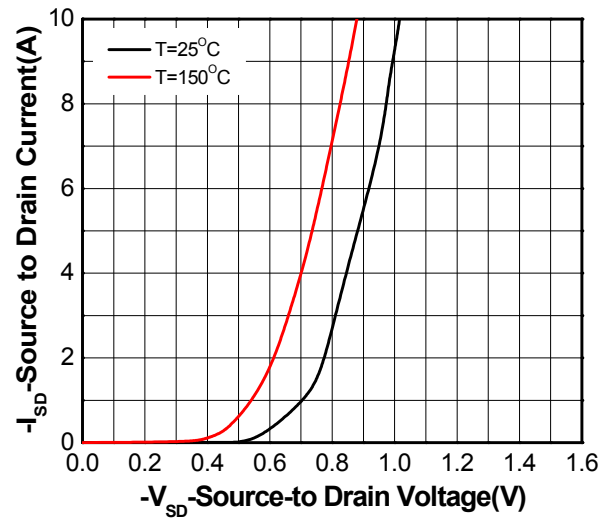
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
<b>OFF CHARACTERISTICS</b>						
Drain-to-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS} = 0\text{ V}, I_D = -250\mu\text{A}$	-12			V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = -12\text{ V}, V_{GS} = 0\text{ V}$			-1	$\mu\text{A}$
Gate-to-source Leakage Current	$I_{GSS}$	$V_{DS} = 0\text{ V}, V_{GS} = \pm 12\text{ V}$			$\pm 100$	nA
<b>ON CHARACTERISTICS</b>						
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{GS} = V_{DS}, I_D = -250\mu\text{A}$	-0.45	-0.75	-0.85	V
Drain-to-source On-resistance <sup>b, c</sup>	$R_{DS(on)}$	$V_{GS} = -4.5\text{ V}, I_D = -3.5\text{ A}$		32	40	m $\Omega$
		$V_{GS} = -2.5\text{ V}, I_D = -3.0\text{ A}$		46	60	
		$V_{GS} = -1.8\text{ V}, I_D = -2.0\text{ A}$		71	90	
Forward Transconductance	$g_{FS}$	$V_{DS} = -5.0\text{ V}, I_D = -2.0\text{ A}$		7.8		S
<b>CAPACITANCES, CHARGES</b>						
Input Capacitance	$C_{ISS}$	$V_{GS} = 0\text{ V},$ $f = 1.0\text{ MHz},$ $V_{DS} = -10\text{ V}$		1224		pF
Output Capacitance	$C_{OSS}$			182.6		
Reverse Transfer Capacitance	$C_{RSS}$			174		
Total Gate Charge	$Q_{G(TOT)}$	$V_{GS} = -4.5\text{ V},$ $V_{DS} = -10\text{ V},$ $I_D = -3.5\text{ A}$		27.3		nC
Threshold Gate Charge	$Q_{G(TH)}$			14.2		
Gate-to-Source Charge	$Q_{GS}$			1.4		
Gate-to-Drain Charge	$Q_{GD}$			5.0		
<b>SWITCHING CHARACTERISTICS</b>						
Turn-On Delay Time	$t_d(ON)$	$V_{GS} = -4.5\text{ V},$ $V_{DD} = -10\text{ V},$ $I_D = -3.5\text{ A},$ $R_G = 6\ \Omega$		74		ns
Rise Time	$t_r$			18.8		
Turn-Off Delay Time	$t_d(OFF)$			62		
Fall Time	$t_f$			38		
<b>BODY DIODE CHARACTERISTICS</b>						
Forward Voltage	$V_{SD}$	$V_{GS} = 0\text{ V}, I_S = -1.0\text{ A}$		-0.78	-1.5	V

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

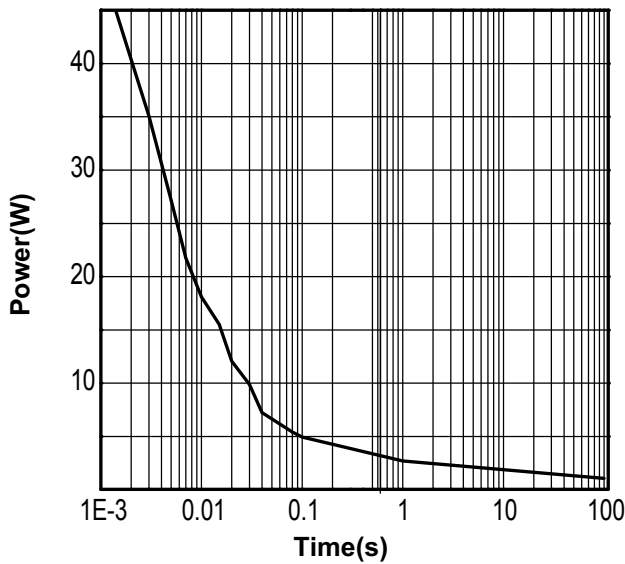




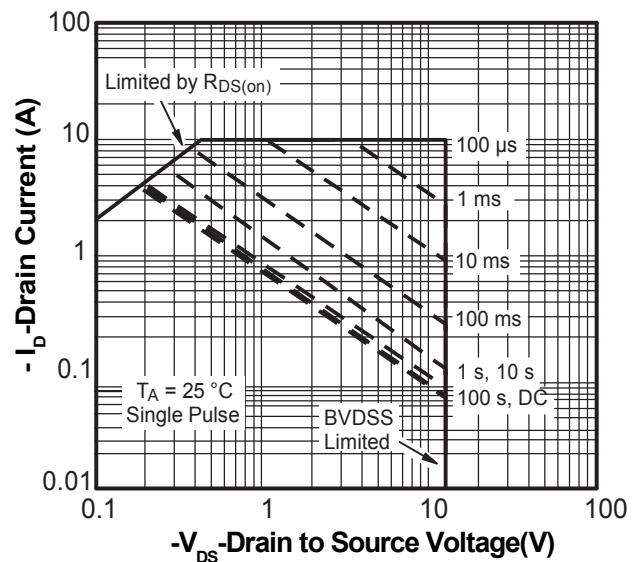
Capacitance



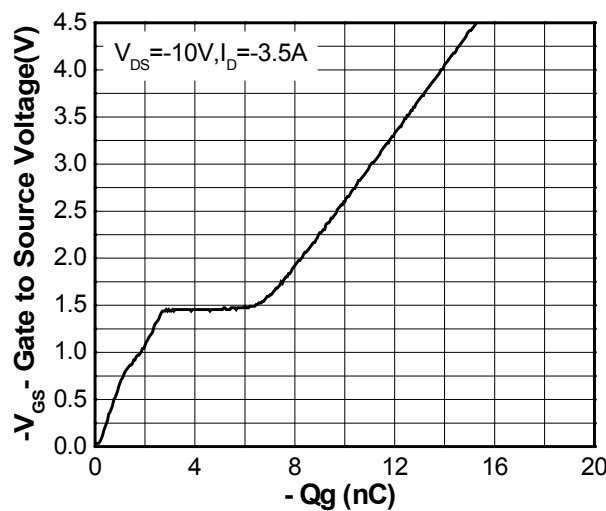
Body diode forward voltage



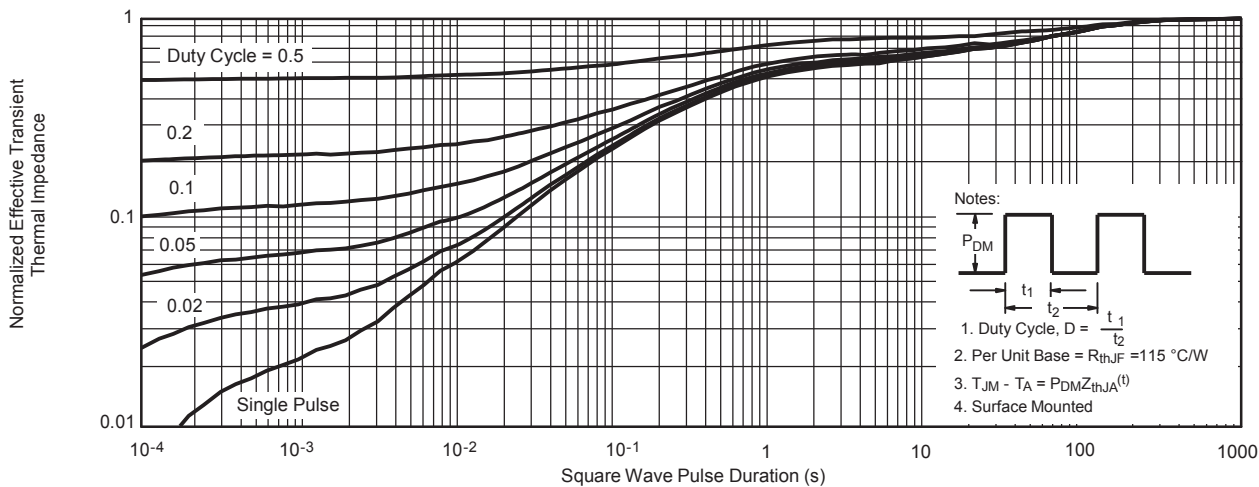
Single pulse power



Safe operating power



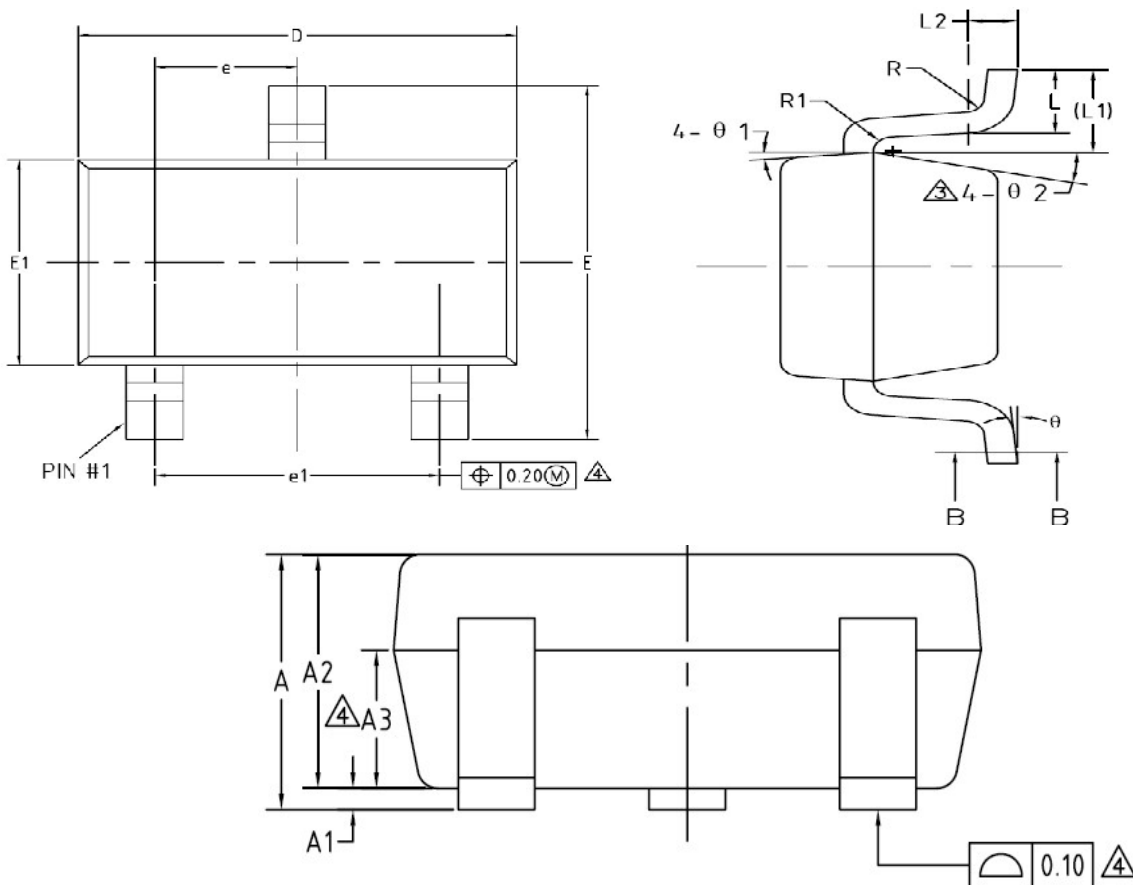
Gate Charge Characteristics



Transient thermal response (Junction-to-Ambient)

Package outline dimensions

SOT-23-3L



SYMBOL	Dimensions in millimeter		
	Min.	Typ.	Max.
A	-	-	1.25
A1	0	-	0.15
A2	1.00	1.10	1.20
A3	0.60	0.65	0.70
D	2.826	2.926	3.026
E	2.60	2.80	3.00
E1	1.526	1.626	1.726
e	0.90	0.95	1.00
e1	1.80	1.90	2.00
L	0.35	0.45	0.60
L1	0.59REF		
L2	0.25BSC		
R	0.05	-	-
R1	0.05	-	0.20
$\theta$	0°	-	8°
$\theta_1$	3°	5°	7°
$\theta_2$	6°	-	14°