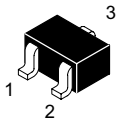
WPM1480

Http://www.sh-willsemi.com

Single P-Channel, -20 V, -1.5 A,Power Mosfet

Description

The WPM1480 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 applications. Standard Product WPM1480 is Pb-free.

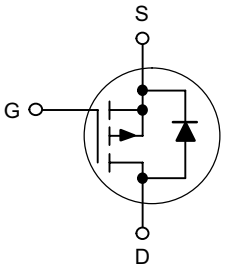


SC−70/SOT−323

Features

$V_{(BR)DSS}$	$R_{DS(on)}$ Typ
−20 V	110 mΩ @ −4.5 V
	150 mΩ @ −2.5 V

P−Channel MOSFET

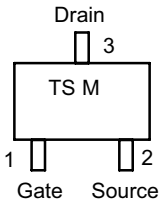


Application

- Li-Ion Battery Charging
- High Side DC-DC Conversion Circuits
- High Side Drive for Small Brushless DC Motors
- Power Management in Portable, Battery Powered Products

Absolute Maximum Ratings (TA=25 unless otherwise specified)

Parameter	Symbol			Value	Units
V_{DS}	Drain-Source voltage			-20	V
V_{GS}	Gate-Source Voltage			±8	V
I_D	Continuous Drain Current[A]	Steady-State	TA=25℃	-1.4	A
		Steady-State	TA=70℃	-1.1	
		t ≦5s	TA=25℃	-1.5	
I_{DM}	Pulse Drain Current [B]		Tp=10us	-3.0	A
P_D	Power Dissipation [B]	TA=25℃		0.29	W
		TA=70℃		0.19	
T_J	Operating Junction Temperature Range			-55~150	℃
Tstg	Storage Temperature Range				



TS = Specific Device Code
M= Date Code

Order information

Part Number	Part Number	Shipping
WPM1480-3/TR	SOT-323/SC-70	3000Tape&Reel

Electrical Characteristics

OFF

Symbol	Parameter	Test conditions		Min.	Typ.	Max.	Units
BV_{DSS}	Drain-Source Voltage	I_D=-250μA, V_{GS}=0V		-20			V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}= -16V, V_{GS}=0V	T_C=25℃			-1	μA
			T_C=55℃			-5	μA
I_{GSS}	Gate-body Leakage Current	V_{DS}=0V, V_{GS}=±8V				±100	nA

ON

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Units
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=-250μA	-0.4	-0.6	-1.0	V
$R_{DS(ON)}$	Static Drain-Source On resistance	V_{GS}= -4.5V, I_D= -1.0A		110	255	mΩ
		V_{GS}= -2.5V, I_D= -0.5A		150	355	mΩ
		V_{GS}= -1.8V, I_D= -0.3A		190	405	mΩ

Dynamic

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Units
g_{FS}	Transconductance	V_{DS}= -10V, I_D = -1A	4	6		S
C_{iss}	Input Capacitance	V_{DS}= -10V, V_{GS}=0V, f=1MHz		480		pF
C_{oss}	Output Capacitance			58		pF
C_{rss}	Reverse Transfer Capacitance			51		pF
R_g	Gate Resistance	V_{DS}=0V, V_{GS}=0V, f=1MHz		12		Ω

Switching

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Units
Q_g	Total Gate Charge	V_{GS}= -4.5V, I_D = -1.2A, V_{DS}= -10V		6.5		nC
Q_{gs}	Gate Source Charge			0.3		nC
Q_{gd}	Gate Drain Charge			0.7		nC
$t_{D(on)}$	Turn-On Delay Time	V_{GS}= -4.5V, V_{DS} = -10V, I_D= -1.2A, R_{GEN}=6Ω		8.0		ns
t_r	Turn-On Rise Time			6.0		ns
$t_{D(off)}$	Turn-Off Delay Time			42		ns
t_f	Turn-Off Fall Time			7.0		ns

Source Drain Diode

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Units
V_{SD}	Diode Forward Voltage	I_S= -1A, V_{GS}=0V		-0.79	-1.5	V
I_s	Maximum Body-diode Continuous Current				-1	A
t_{rr}	Body-diode Reverse Recovery Time	I_s= -1.0A, di/dt=100A/μs		30		ns
Q_{rr}	Body-diode Reverse Recovery Charge			12		nC

Thermal Characteristic

Symbol	Parameter		Typ.	Max.	Unit.
$R_{\theta JA}$	Junction to Ambient [A]	t ≤ 5μs	250	375	℃/W
		Steady-State	345	430	℃/W
$R_{\theta JL}$	Junction to Lead [C]	Steady-State	80	100	℃/W

A: Surface−mounted on FR4 board using 1″ sq pad size (Cu area = 1.127 in sq [1 oz] including traces).
B: Repetitive rating, pulse width limited by junction temperature.
C: The $R_{\theta JA}$ is the sum of the thermal impedence from junction to lead $R_{\theta JL}$ and lead to ambient

Typical Performance Characteristis

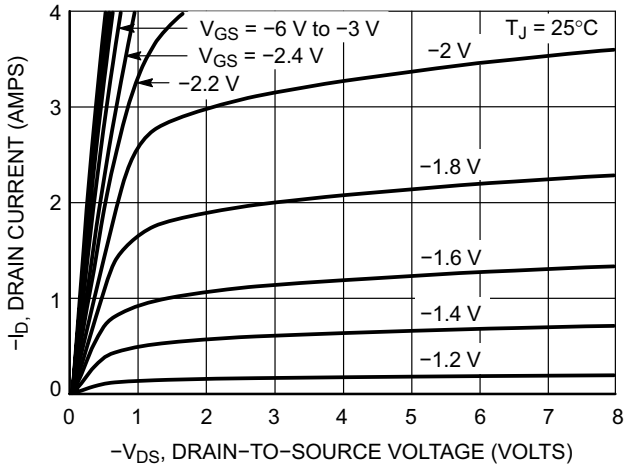


Figure 1. On−Region Characteristics

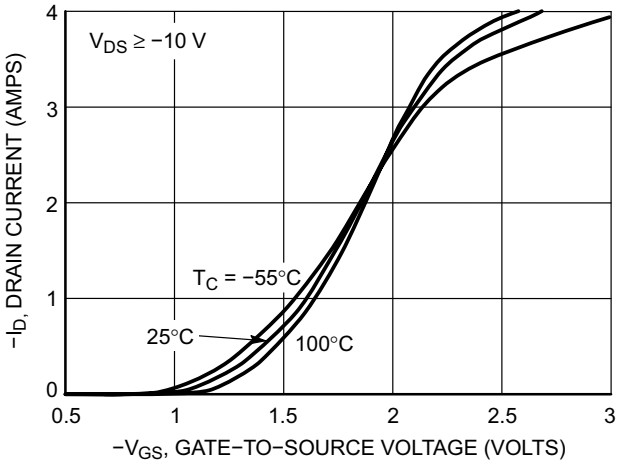


Figure 2. Transfer Characteristics

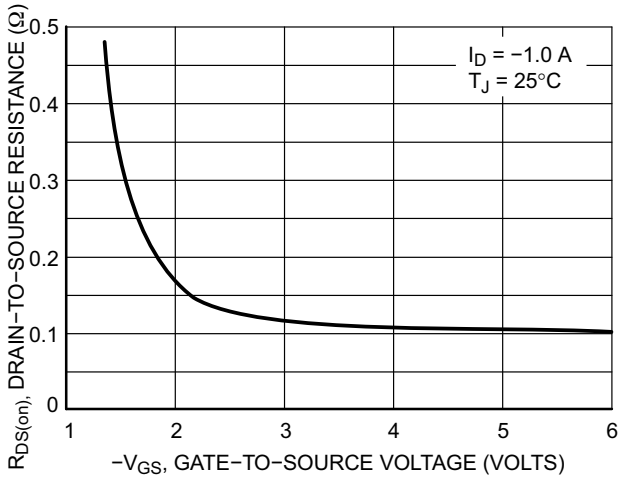


Figure 3. On−Resistance vs. Gate−to−Source Voltage

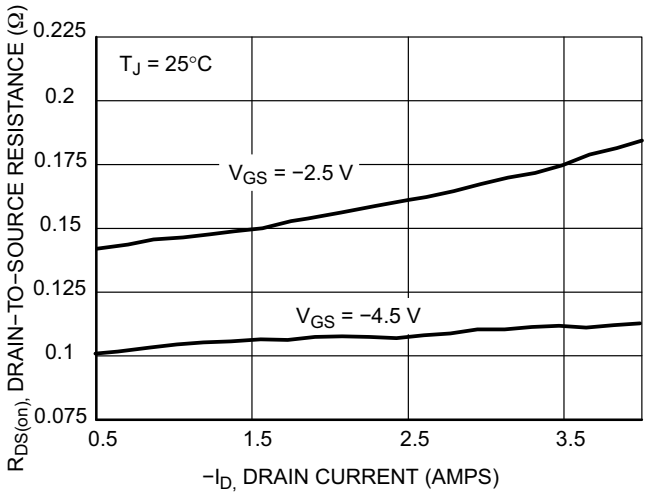


Figure 4. On−Resistance vs. Drain Current and Gate Voltage

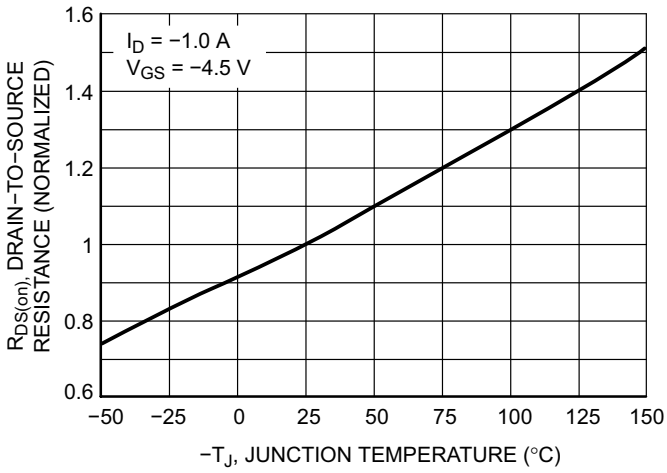


Figure 5. On−Resistance Variation with Temperature

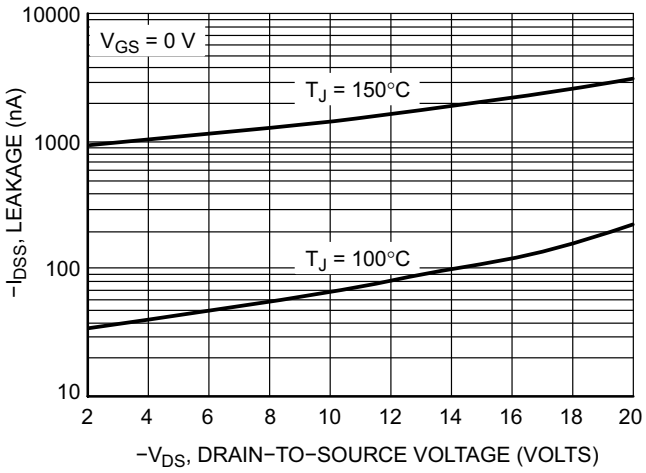


Figure 6. Drain−to−Source Leakage Current vs. Voltage

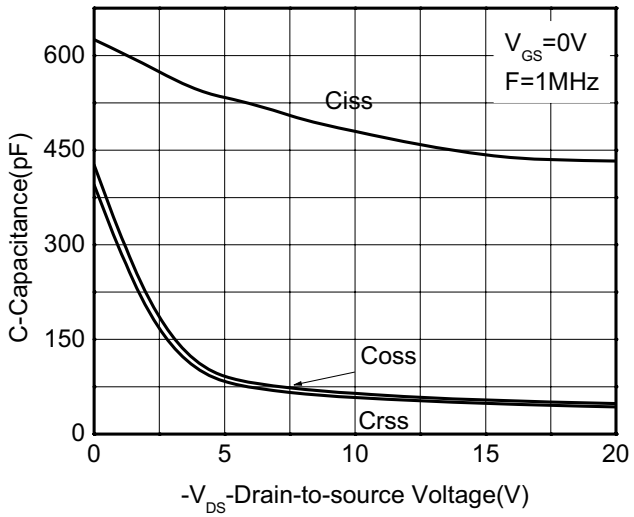


Figure 7. Capacitance Variation

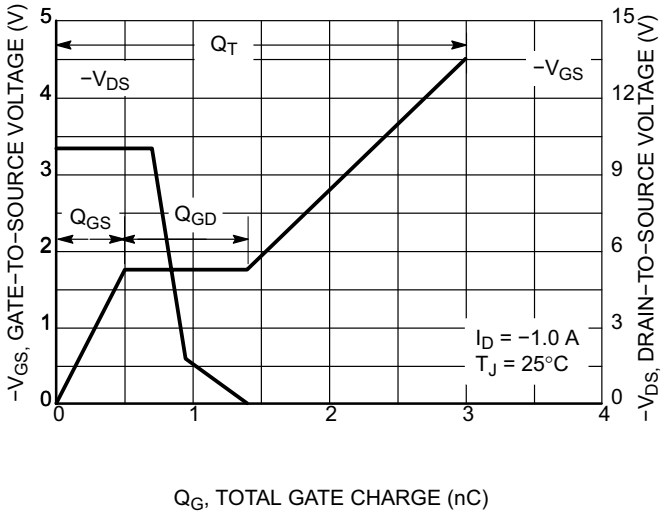


Figure 8. Gate−to−Source and Drain−to−Source Voltage vs. Total Charge

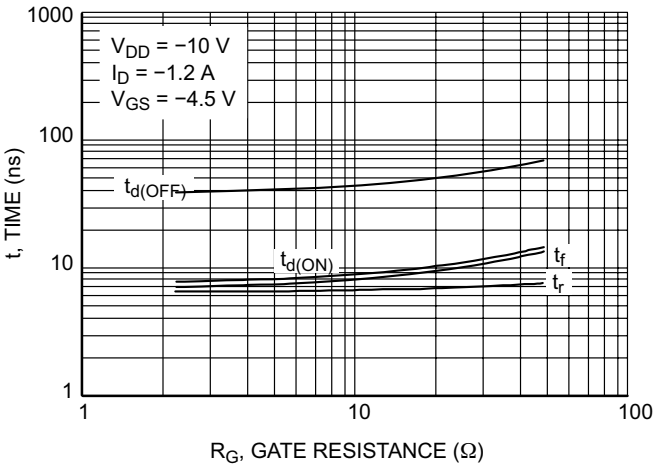


Figure 9. Resistive Switching Time Variation vs. Gate Resistance

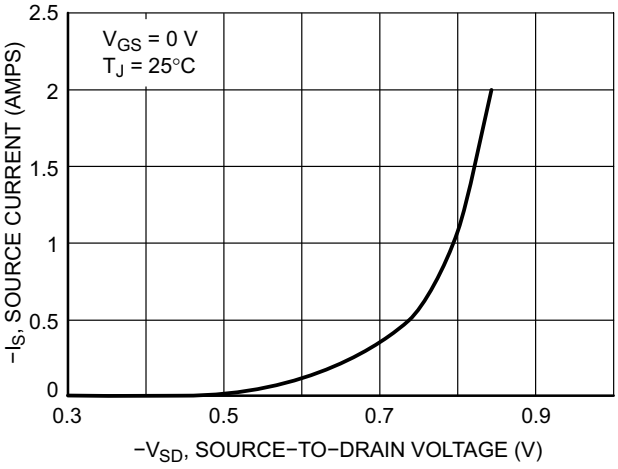


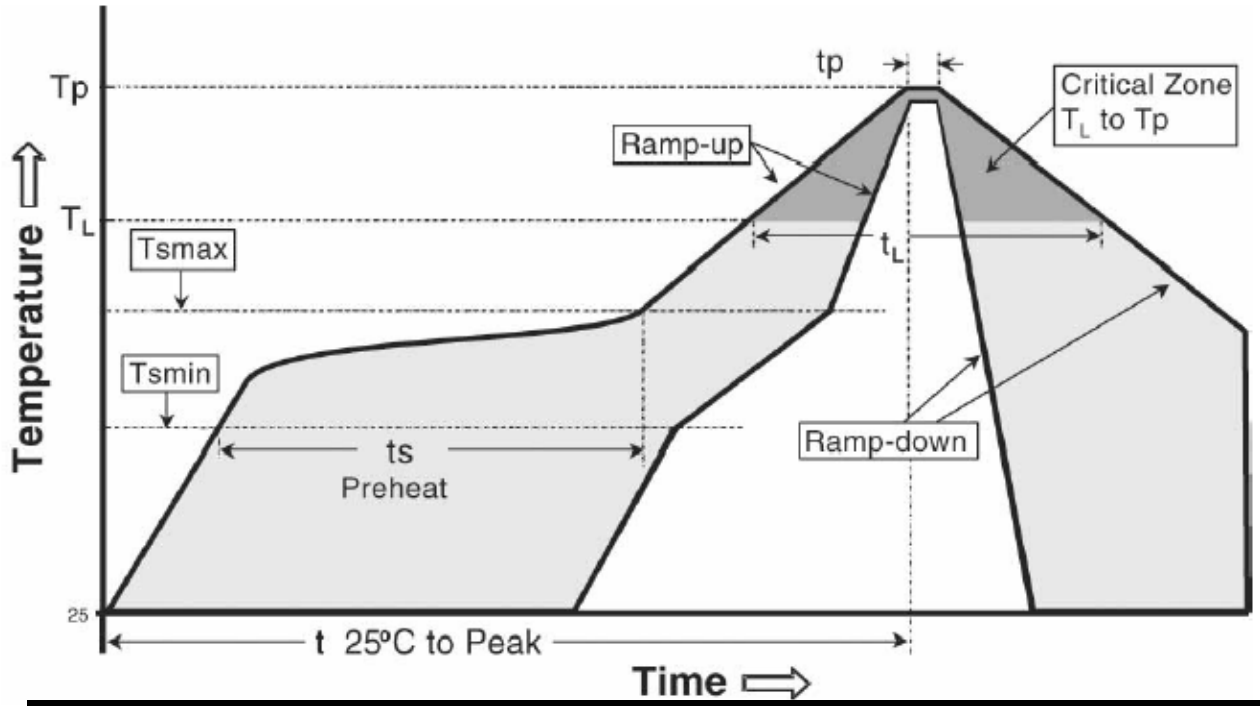
Figure 10. Diode Forward Voltage vs. Current

表 回流焊试验条件

回流焊条件	无铅电镀产品	
	塑封体厚度≥2.5 mm 或塑封体体积 ≥350 mm³	**塑封体厚度< 2.5 mm 且塑封体体积 < 350 mm³**
温度上升速率	3 °C/second max.	
预热温度 -低温 (Ts(min)) -高温 m(Ts(ax)) -时间 (低温到高温) (ts)	 150 °C 200 °C 60-180 seconds	
从预热温度Ts(max)到维持温度TL - 温升速率	 3 °C/second max.	
Time maintained above: - 温度 (TL) - 时间(tL)	 217 °C 60-150 seconds	
波峰温度 (Tp)	245+0/-5 °C	260+0/-5 °C
维持在波峰温度的时间 Temperature (tp)	10-30seconds	20-40seconds
降温速率	6 °C/second max.	
从 25 C到波峰温度的时间	8 minutes max.	

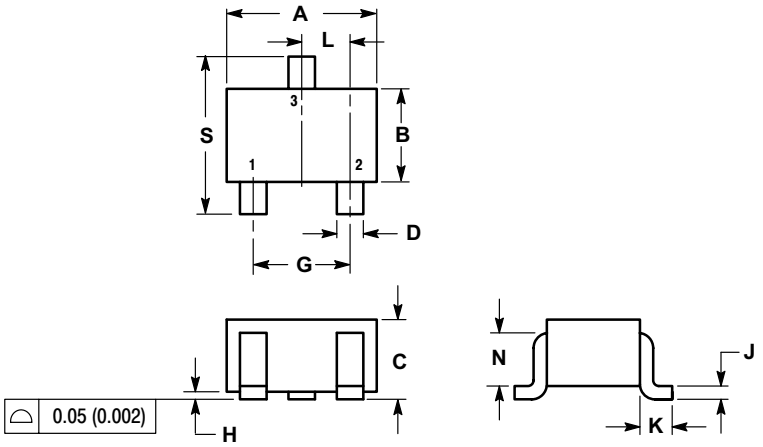
注：所有的温度都是指样品上部塑封体表面的温度。

Welding temperature curve



Packaging Information

SOT-323/SC-70 Package Outline Dimension



NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.

	INCHES		MILLIMETERS	
DIM	MIN	MAX	MIN	MAX
A	0.071	0.087	1.80	2.20
B	0.045	0.053	1.15	1.35
C	0.032	0.040	0.80	1.00
D	0.012	0.016	0.30	0.40
G	0.047	0.055	1.20	1.40
H	0.000	0.004	0.00	0.10
J	0.004	0.010	0.10	0.25
K	0.017 REF		0.425 REF	
L	0.026 BSC		0.650 BSC	
N	0.028 REF		0.700 REF	
S	0.079	0.095	2.00	2.40

STYLE 8:
PIN 1. GATE
2. SOURCE
3. DRAIN

SOLDERING FOOTPRINT

