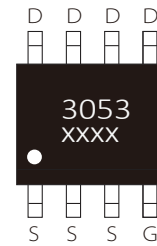


FEATURES

- | Low $R_{DS(on)}$ Provides Higher Efficiency and Extends Battery Life
- | Excellent ON resistance for higher DC current :
 $R_{DS(ON)} < 53m\ \Omega @ V_{GS} = -10V$ (Type:39.5m Ω)
- | $V_{DS} = -30V, I_D = -4.2A$
- | Supper high density cell design
- | High performance trench technology
- | High Power and current handing capability
- | Surface Mount Package



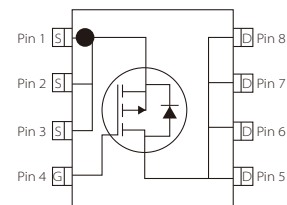
SOP-8



Marking

APPLICATION

- | Load/Power Switching for portable device
- | Charging device
- | Power supply converters circuit



Schematic Symbol

APPROVALS

RoHS	Compliance with 2011/65/EU
HF	Compliance with IEC61249-2-21:2003

ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	-30	V
Maximum Drain Current - Continuous (Ta=25°C)	I_D	-4.2	A
Maximum Drain Current - Continuous(Ta=70°C)	I_D	-3.4	A
Pulsed Drain Current	I_{DM}	-15	A
Gate-Source Voltage	V_{GS}	±20	V
Maximum Power Dissipation	P_D	2.5	W
Thermal Resistance from Junction to Ambient	$R_{\theta JA}$	50	°C/W
Junction and Storage Temperature Range	T_J, T_{STG}	-55 to 150	°C
Lead Solder Temperature – Maximum (10 Second Duration)	T_L	260	°C

ELECTRICAL CHARACTERISTICS (Ta=25°C)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Static Characteristics						
Drain-source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=-250\mu A$	-30			V
Gate-body leakage current	I_{GSS}	$V_{DS}=\pm 20V, V_{GS}=0V$			± 0.1	μA
Zero gate voltage drain current	I_{DSS}	$V_{DS}=-30V, V_{GS}=0V$			-1	μA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-250\mu A$	-1	-1.6	-2.2	μA
Forward Trans conductance	g_{FS}	$V_{DS}=-15V, I_D=-4.2\mu A$		6.6		S
Drain-source on-state resistance ⁽²⁾	$R_{DS(on)}$	$V_{GS}=-10V, I_D=-4.2A$		39.5	53	$m\Omega$
		$V_{GS}=-4.5V, I_D=-3A$		59	78	$m\Omega$
Dynamic characteristics						
Input capacitance	C_{iss}	$V_{DS}=-10V, V_{GS}=0V, f=1MHz$		870		pF
Output capacitance	C_{oss}			220		pF
Reverse transfer capacitance	C_{rss}			720		pF
Turn-on delay time	$t_{d(on)}$	$V_{DD}=-15V, I_D=-1.0A$ $R_D=10.0\Omega, R_G=6.0\Omega$		14	30	ns
Turn-on Rise Time	t_r			21	60	ns
Turn-Off Delay Time	$t_{d(off)}$			97	150	ns
Turn-off Fall yime	t_f			71	100	ns
Total Gate Charge	Q_{gs}	$V_{DS}=-15V, I_D=-4.2A$ $V_{GS}=-10V$		27	40	nC
Gate-Source Charge	Q_{gs}			5.2		nC
Gate-Drain Charge	Q_{gd}			7.5		nC
Drain Source Body Diode Characteristics						
Diode Forward voltage ⁽²⁾	V_{DS}	$V_{GS}=0V, I_S=-10A$			-1.2	V

Notes:

1. Repetitive Rating: pulse width limited by maximum junction temperature
2. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.
3. Surface Mounted on FR4 Board, $t \leq 10$ sec

PARAMETER CHARACTERISTIC CURVE

Figure1: Typical Output Characteristics

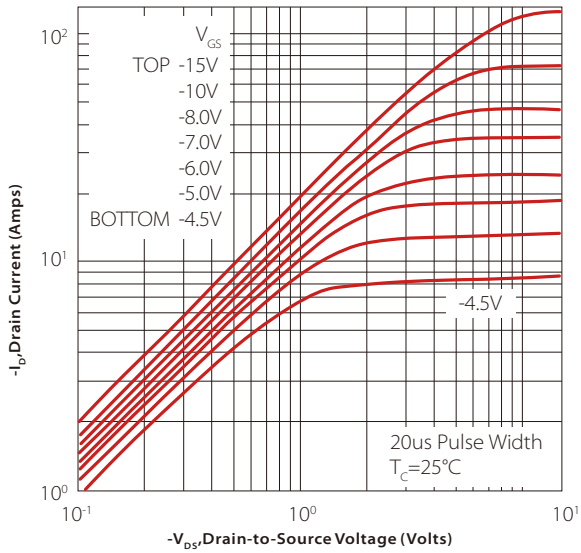


Figure2: Typical Output Characteristics

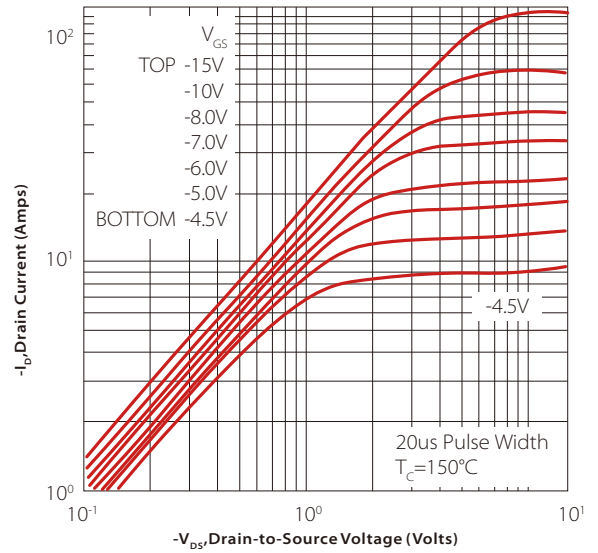


Figure3: Typical Transfer Characteristics

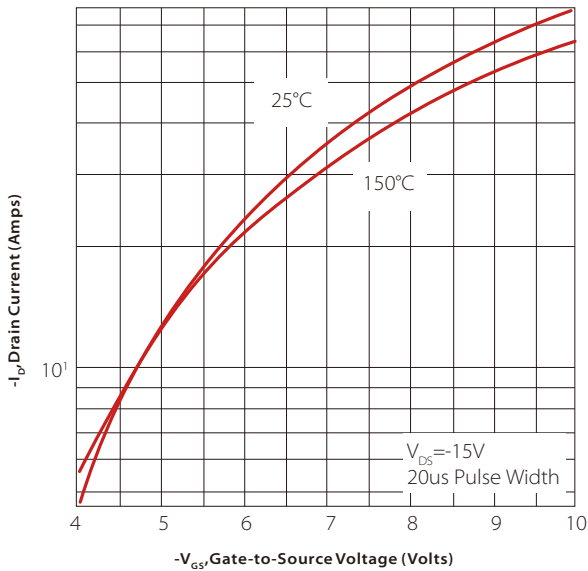


Figure 4: Normalized On-Resistance Vs. Temperature

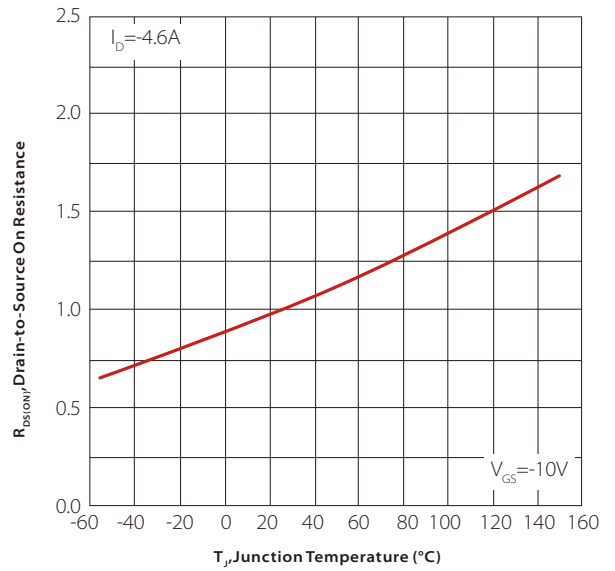


Figure 5: Typical Capacitance Vs. Drain-to-Source Voltage

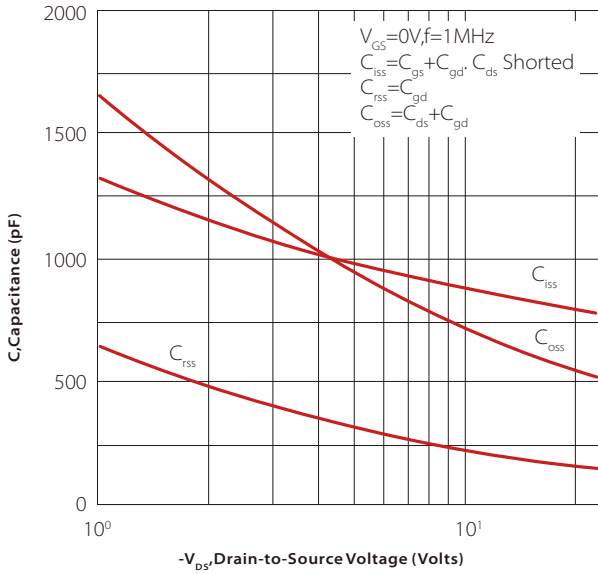


Figure 6: Typical Gate Charge Vs. Gate-to-Source Voltage

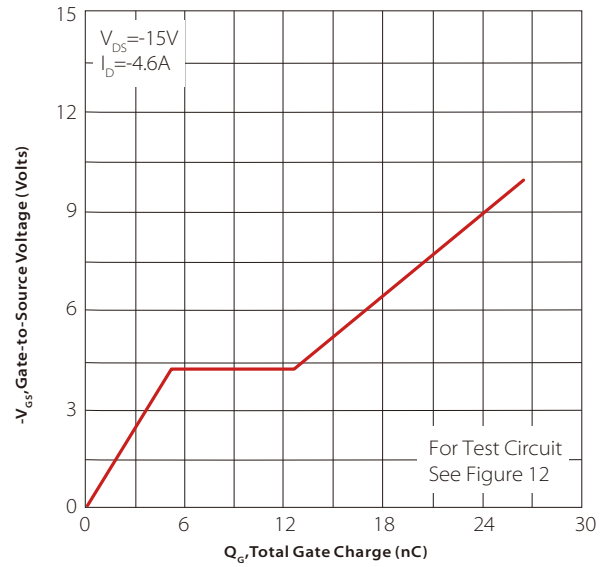


Figure 7: Typical Source-Drain Dide Forward Voltage

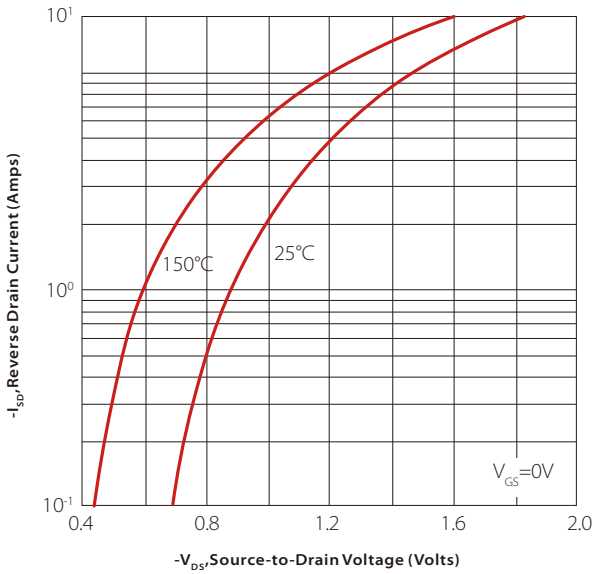


Figure 8: Maximum Safe Operation Area

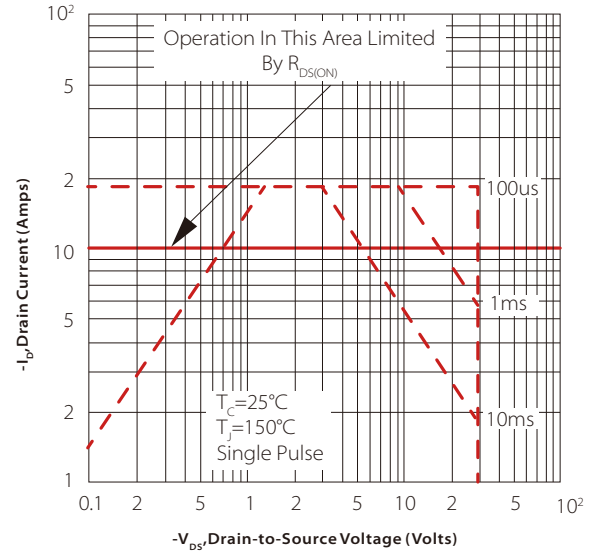
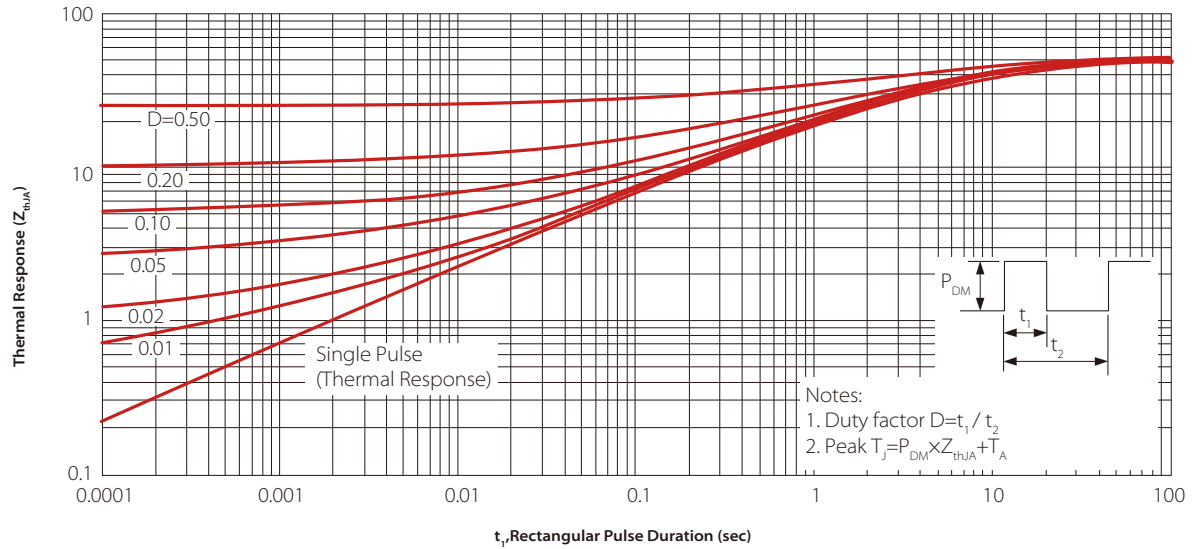
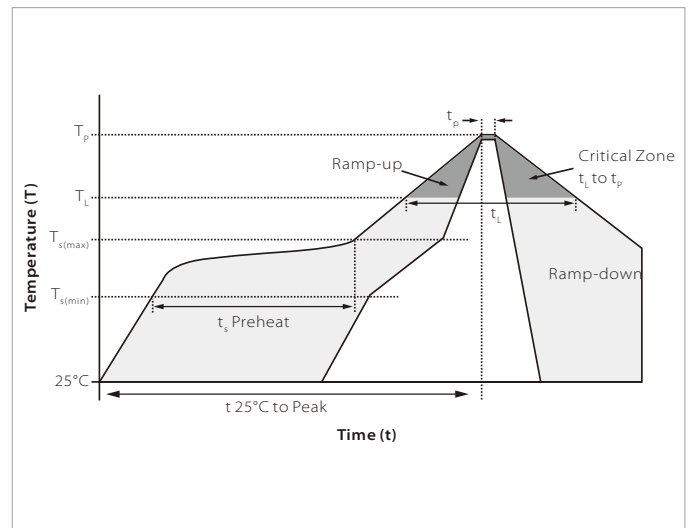


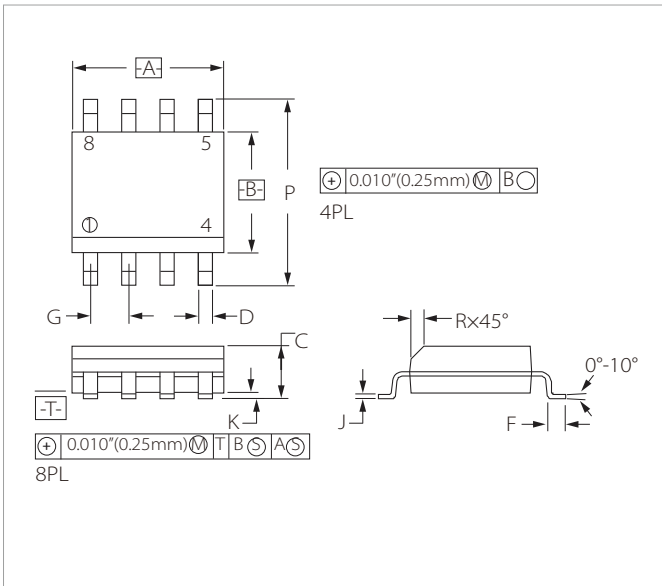
Figure 9: Maximum Effective Transient Thermal Impedance, Junction-to-Ambient


SOLDERING PARAMETERS

Reflow Condition		Lead-free assembly
Pre Heat	Temperature Max ($T_{s(min)}$)	150°C
	Temperature Max ($T_{s(max)}$)	200°C
	Time (min to max) (t_2)	60 – 180 secs
Average ramp up rate (Liquidus Temp (T_L) to peak)		3°C/second max
$T_{s(max)}$ to T_L - Ramp-up Rate		3°C/second max
Reflow	Temperature (T_L) (Liquidus)	217°C
	Time (min to max) (t_1)	60 – 150 seconds
Peak Temperature (T_p)		260°C
Time within 5°C of actual peak Temperature (t_p)		20 – 40 seconds
Ramp-down Rate		6°C/second max
Time 25°C to peak Temperature (T_p)		8 minutes max.
Do not exceed		260°C

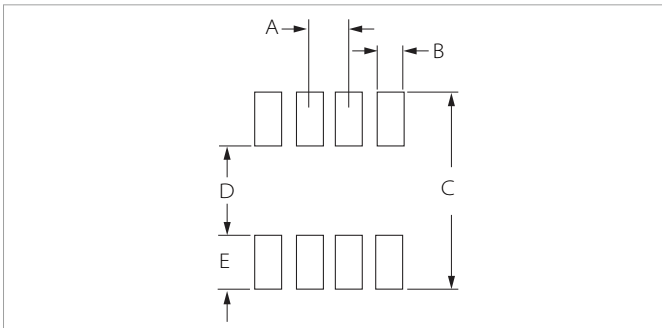


SOP-8 PACKAGE INFORMATION



Ref.	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	4.80	5.00	0.189	0.196
B	3.80	4.00	0.150	0.157
C	1.35	1.75	0.054	0.068
D	0.35	0.49	0.014	0.019
F	0.40	1.25	0.016	0.049
G	1.27BSC		0.050BSC	
J	0.18	0.25	0.007	0.009
K	0.10	0.25	0.004	0.008
P	5.80	6.20	0.229	0.244
R	0.25	0.50	0.010	0.019

RECOMMENDED PAD LAYOUT DIMENSIONS



Ref.	Millimeters		Inches	
	Min	Max	Min	Max
A	1.14	1.40	0.045	0.055
B	0.64	0.89	0.025	0.035
C	6.22	-	0.245	-
D	3.94	4.17	0.155	0.165
E	1.02	1.27	0.040	0.050

ORDERING INFORMATION

Part Number	Component Package	QTY/Reel	Reel Size
SPM3053PE	SOP-8	3000PCS	7"

Headquarters

No.3387 Shendu Road Pujiang
I&E Park
Minhang Shanghai China
201000

Hotline

400-021-5756

Web

<https://www.semiware.com>

Sales Center

Tel: 86-21-3463-7458
Email: sales18@semiware.com

Customer Service

Tel: 86-21-5484-1001
Email: sales17@semiware.com

Technical Support

Tel: 86-21-3463-7654
Email: fae01@semiware.com

Complaint & Suggestions

Tel: 86-21-3463-7172
Ext: 8868
Email: cs03@semiware.com

By QR Code

Website



Wechat

To find your local partner within Semiware's global network: www.semiware.com

© 2022 Semiware Semiconductor Inc.

The content of this document has been carefully checked and understood. However, neither Semiware nor its subsidiaries assume any liability whatsoever for any errors or inaccuracies of this document and the consequences thereof. Published specifications are subject to change without notice. Product suitability for any area of application must ultimately be determined by the customer. In all cases, products must never be operated outside their published specifications. Semiware does not guarantee the availability of all published products. This disclaimer shall be governed by substantive Chinese law and resulting disputes shall be settled by the courts at the place of business of Semiware. Latest publications and a complete disclaimer can be downloaded from the Semiware website. All trademarks recognized.