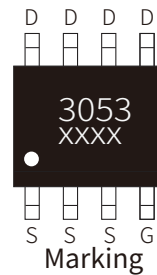


FEATURES

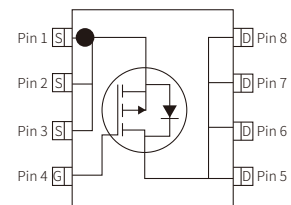
- Low $R_{DS(on)}$ Provides Higher Efficiency and Extends Battery Life
- Excellent ON resistance for higher DC current :
 $R_{DS(ON)} < 53m\ \Omega$ @ $V_{GS} = -10V$ (Type:39.5m Ω)
- $V_{DS} = -30V, I_D = -4.2A$
- Supper high density cell design
- High performance trench technology
- High Power and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



SOP-8



Marking



Schematic Symbol

APPLICATION

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

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 ($T_a=25^{\circ}C$)	I_D	-4.2	A
Maximum Drain Current - Continuous($T_a=70^{\circ}C$)	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	$^{\circ}C/W$
Junction and Storage Temperature Range	T_J, T_{STG}	-55 to 150	$^{\circ}C$
Lead Solder Temperature – Maximum (10 Second Duration)	T_L	260	$^{\circ}C$

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	V
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 Ω
		$V_{GS}=-4.5V, I_D=-3A$		59	78	m Ω
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

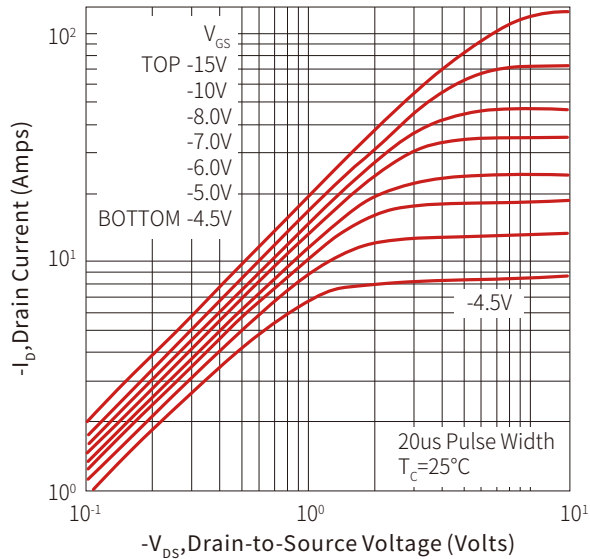


Figure2: Typical Output Characteristics

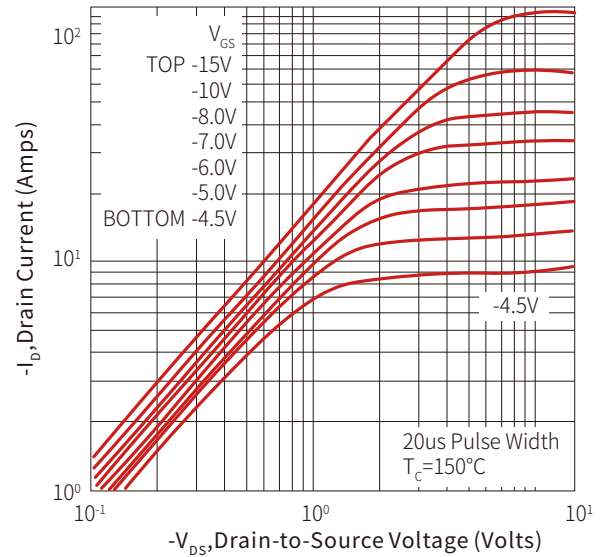


Figure3: Typical Transfer Characteristics

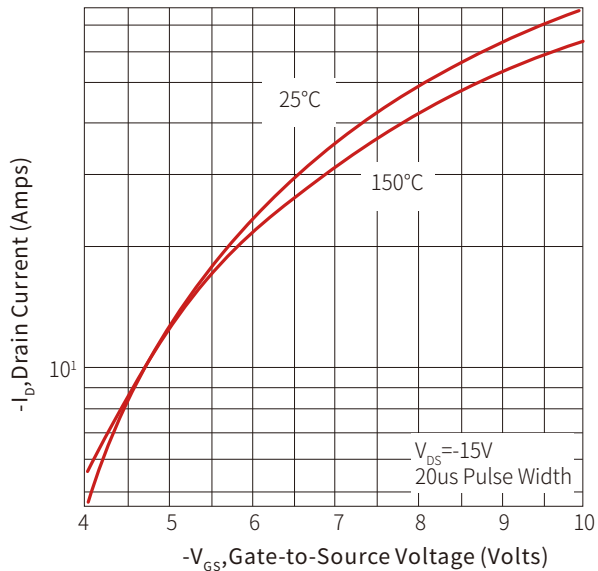
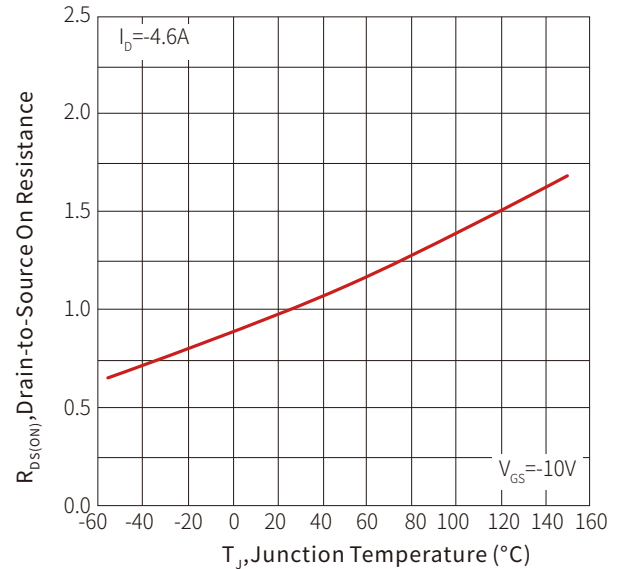


Figure 4: Normalized On-Resistance Vs.Temperature



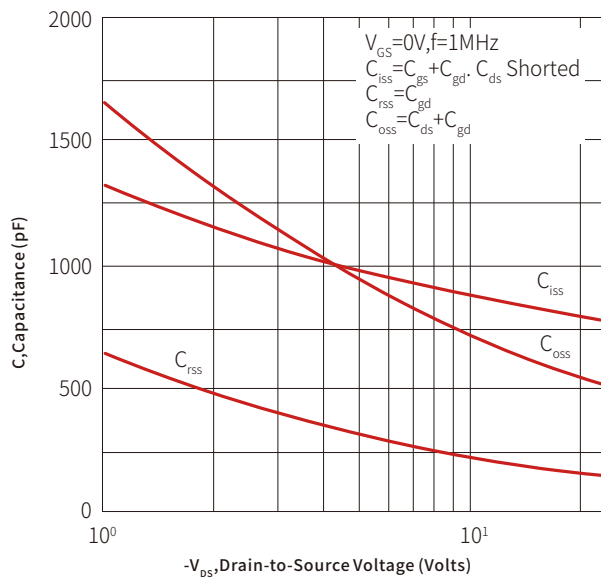
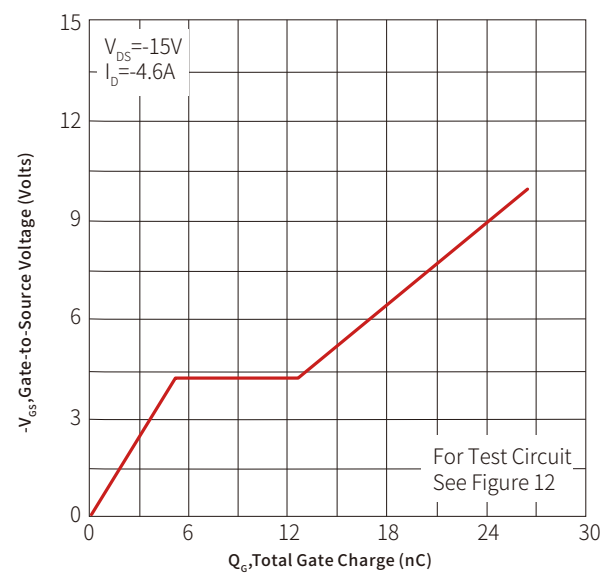
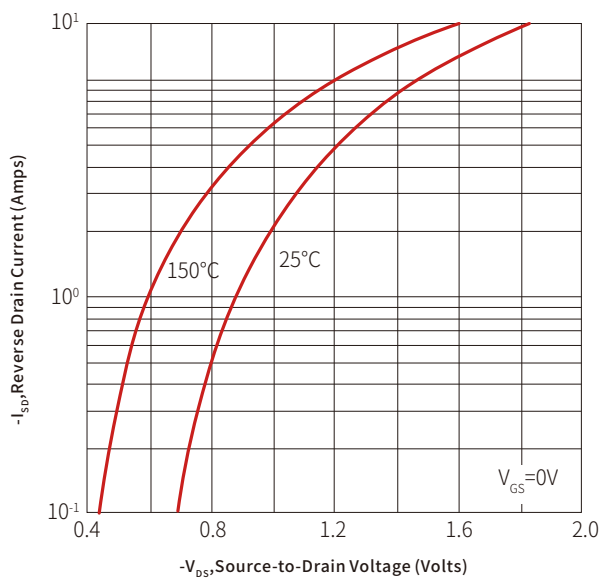
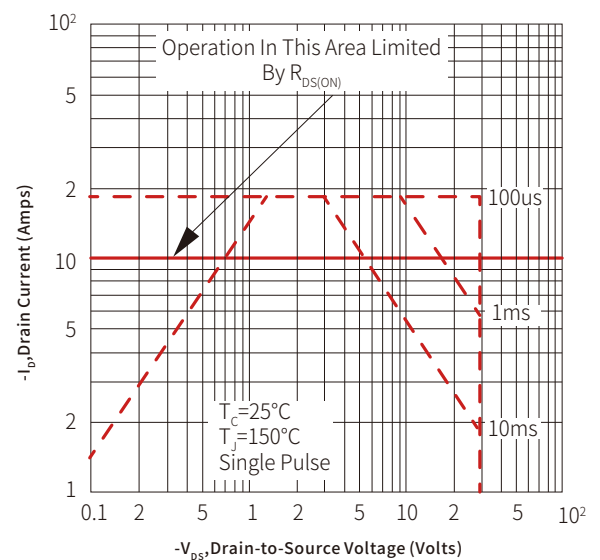
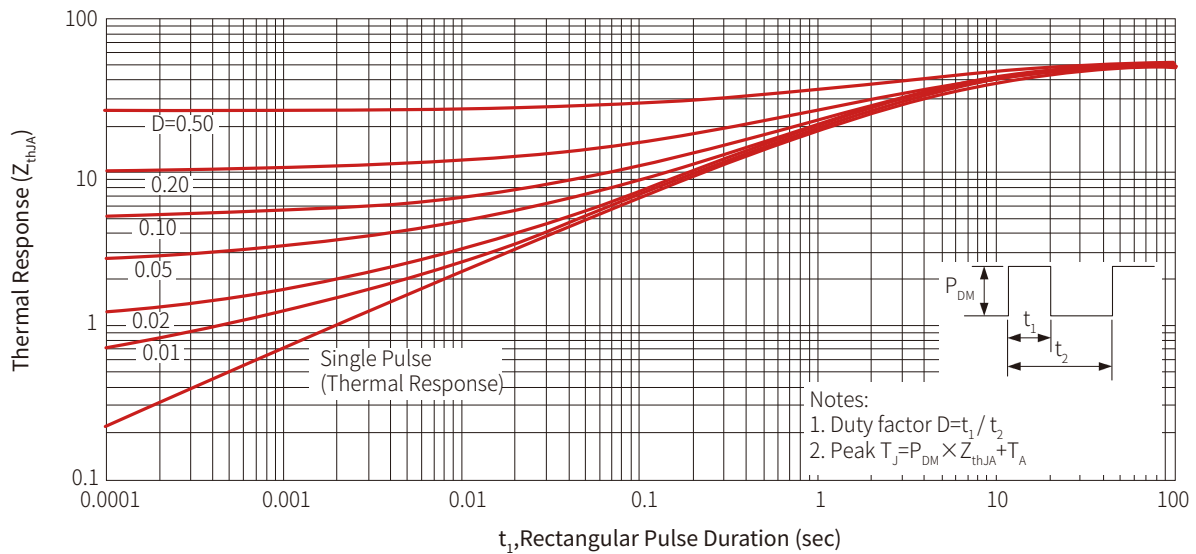
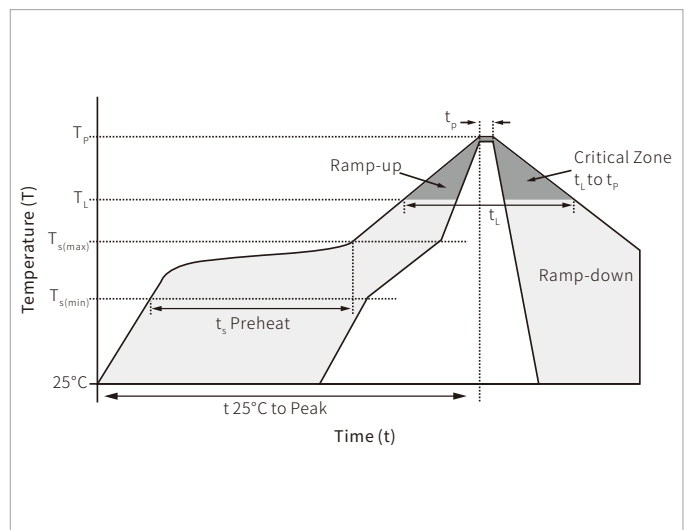
**Figure 5: Typical Capacitance Vs. Drain-to-Source Voltage****Figure 6: Typical Gate Charge Vs. Gate-to-Source Voltage****Figure 7: Typical Source-Drain Dide Forward Voltage****Figure 8: Maximum Safe Operation Area**

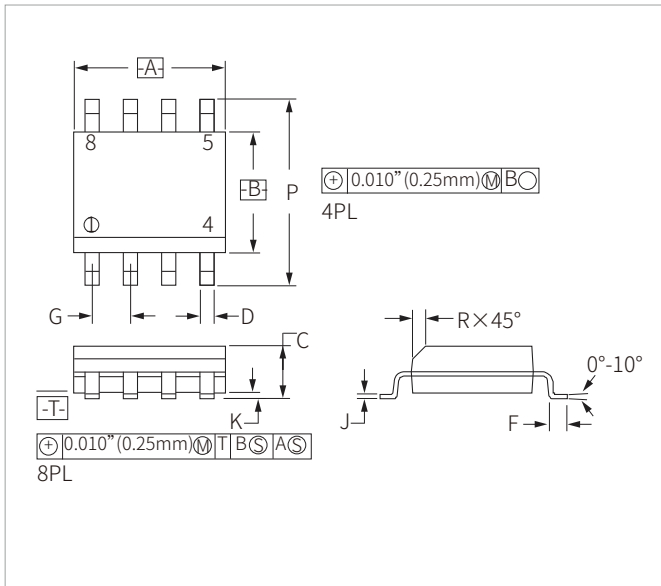
Figure 9: Maximum Effective Transient Thermal Impedance, Junction-to-Ambient


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_s)	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_L)	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

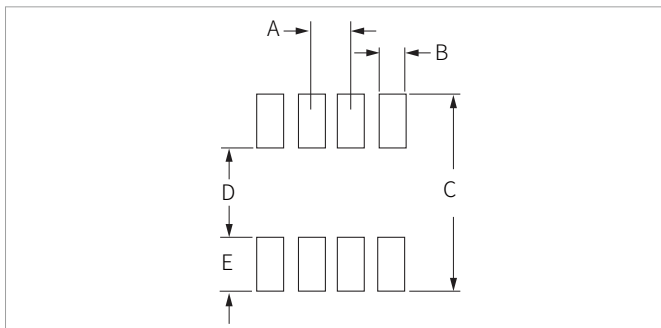


SOP-8 PACKAGE INFORMATION



Ref.	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	4.70	5.30	0.185	0.209
B	3.80	4.20	0.150	0.165
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"

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