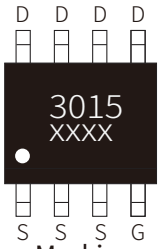
FEATURES

- Low $R_{DS(on)}$ Provides Higher Efficiency and Extends Battery Life
- Excellent ON resistance for higher DC current :
  $R_{DS(ON)}$ < 15m Ω @ V_{GS} =-10V (Type:12.5mΩ)
- V_{DS} =-30V,I_D =-20A
- Supper high density cell design
- High performance trench technology
- High Power and current handing capability
- Surface Mount Package

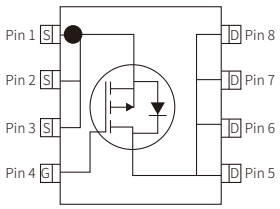
SOP-8



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	-20	A
Maximum Drain Current - Continuous(Ta=70°C)	I_D	-15.7	A
Pulsed Drain Current	I_{DM}	-65	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
Single Pulse Avalanche Energy	EAS	370	mJ
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=-250μA	-30			V
Gate-body leakage current	I_{GSS}	V_{DS}=±20V,V_{DS}=0V			±0.1	uA
Zero gate voltage drain current	I_{DSS}	V_{DS}=-30V,V_{GS}=0V			-1	uA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=-250uA	-1.2	-1.6	-2.0	V
Forward Trans conductance	g_{FS}	V_{DS}=-10V,I_D=-2.8μA		5.6		S
Drain-source on–state resistance(2)	$R_{DS(on)}$	V_{GS}=-10V,I_D=-20A		12.5	15	mΩ
		V_{GS}=-4.5V,I_D=-20A		22	26	mΩ
Dynamic characteristics						
Input capacitance	C_{iss}	V_{DS}=-25V,V_{GS}=0V,f=1MHz		1700		pF
Output capacitance	C_{oss}			410		pF
Reverse transfer capacitance	C_{rss}			890		pF
Turn–on delay time	$t_{d(on)}$	V_{DD}=-15V,I_D=-5.6A R_D=2.7Ω,R_G=6.0Ω		18		ns
Turn–on Rise Time	t_r			49		ns
Turn–Off Delay Time	$t_{d(off)}$			59		ns
Turn–off Fall yime	t_f			60		ns
Total Gate Charge	Q_{gs}	V_{DS}=-24V,I_D=-5.6A V_{GS}=-10V		61	92	nC
Gate-Source Charge	Q_{gs}			8.0	12	nC
Gate-Drain Charge	Q_{gd}			22	32	nC
Drain Source Body Diode Characteristics						
Diode Forward voltage(2)	V_{DS}	V_{GS}=0V,I_S=-5.6A			-1.0	V

Notes:
1. Repetitice Rating: pulse width limited by maximum junction temperature
2. Pulse Test:Pulse Width≤300μs,Duty Cycle≤2%.

PARAMETER CHARACTERISTIC CURVE

Figure1: Typical Output Characteristics

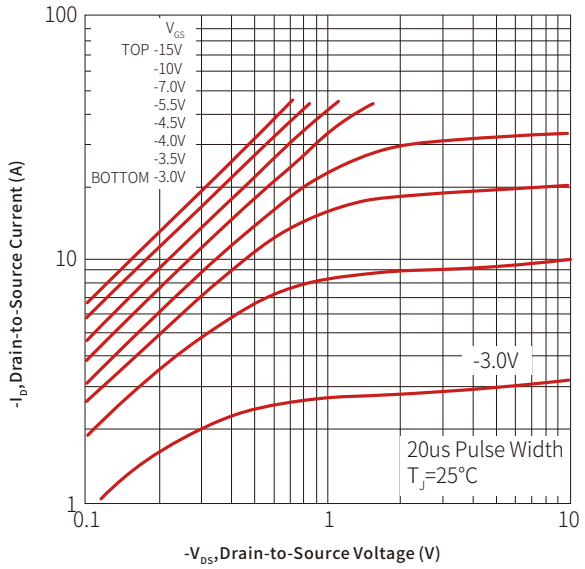


Figure2: Typical Output Characteristics

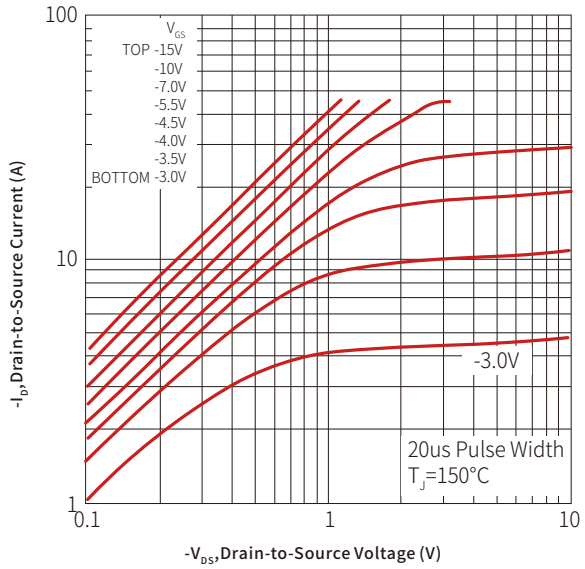


Figure3: Typical Transfer Characteristics

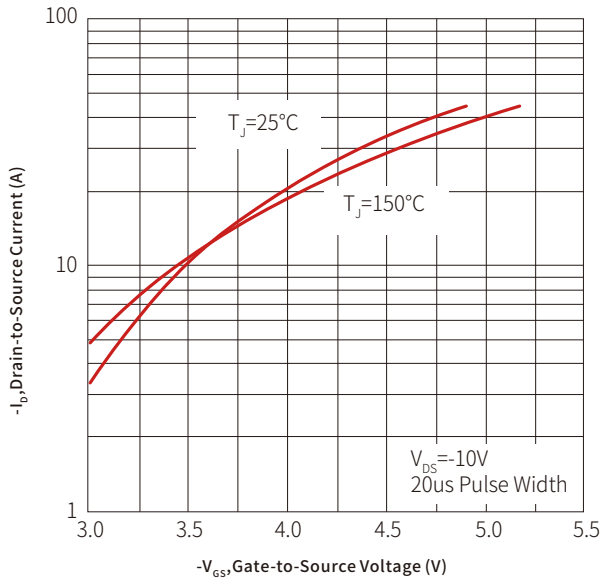


Figure 4: Normalized On-Resistance Vs.Temperature

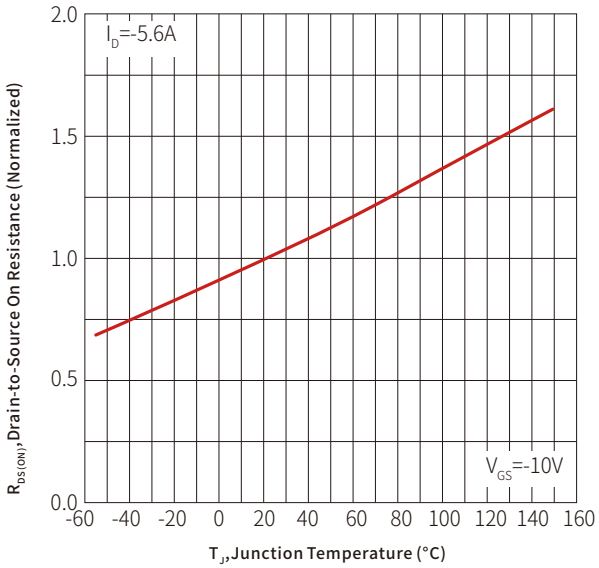


Figure 5: Typical Capacitance Vs. Drain-to-Source Voltage

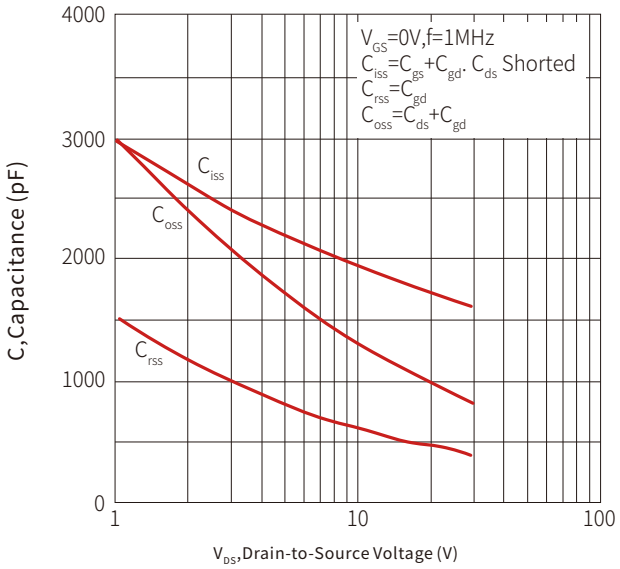


Figure 6: Typical Gate Charge Vs. Gate-to-Source Voltage

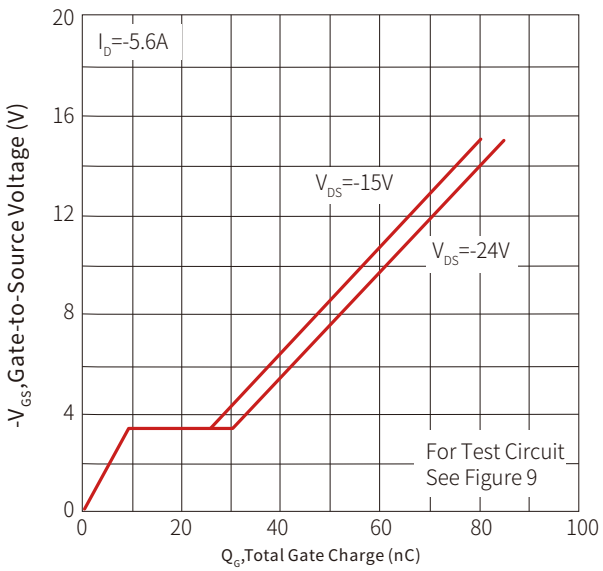


Figure 7: Typical Source-Drain Dide Forward Voltage

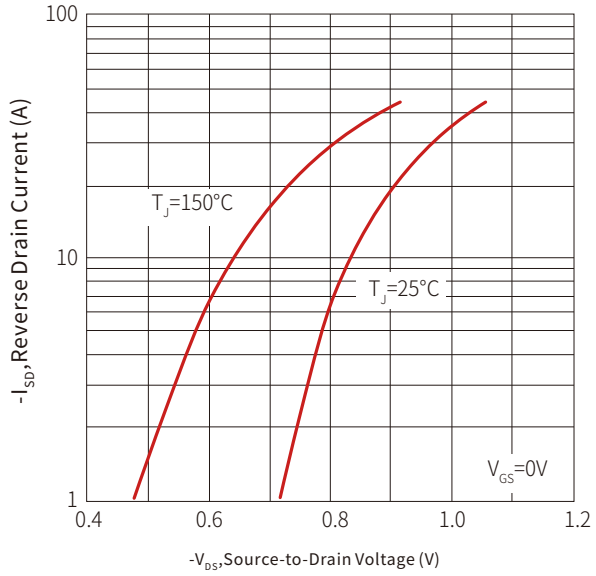


Figure 8: Maximum Safe Operation Area

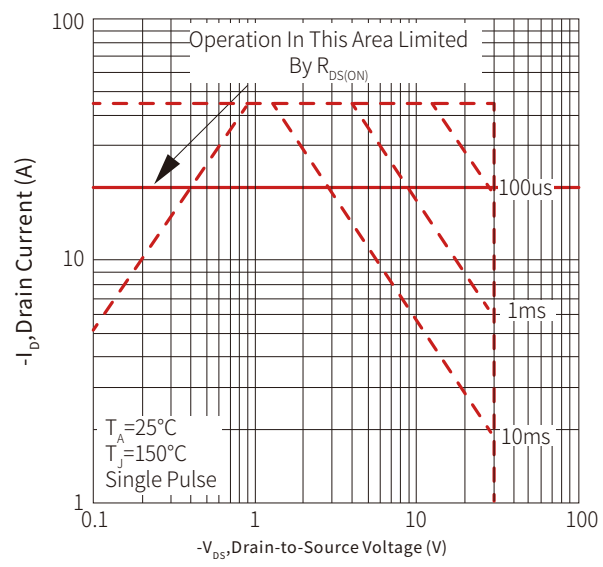
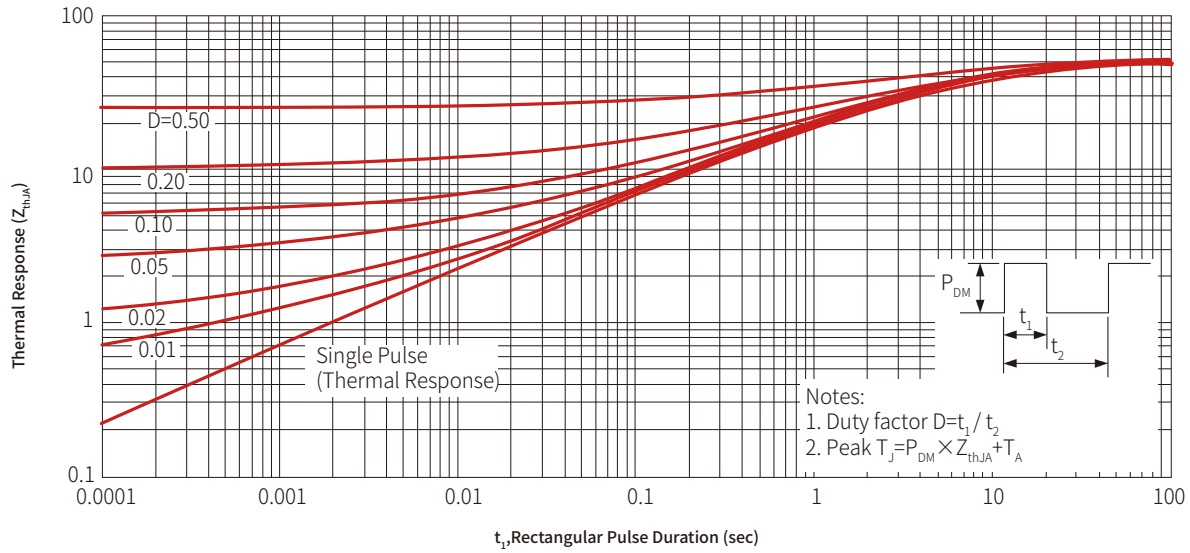
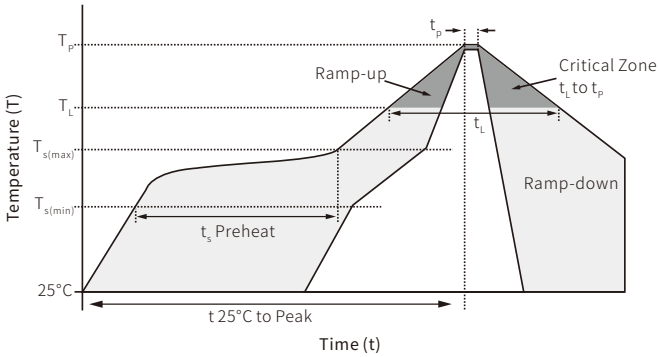


Figure 9: Maximum Effective Transient Thermal Impedance,Junction-to-Ambient

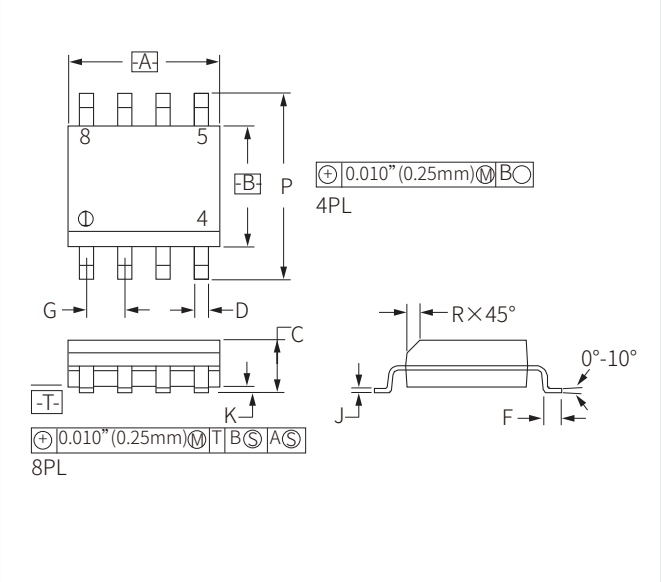


SOLDERING PARAMETERS

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

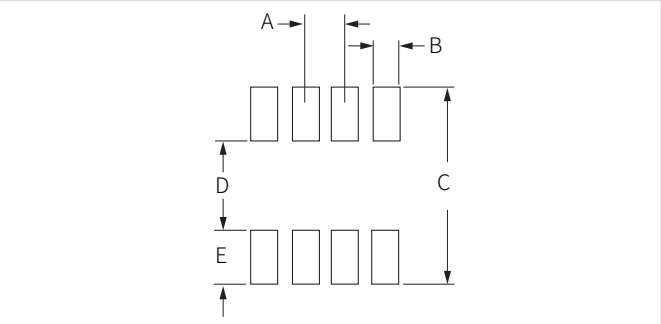


SOP-8 PACKAGE INFORMATION



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
SPM3015PE	SOP-8	3000PCS	7”

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