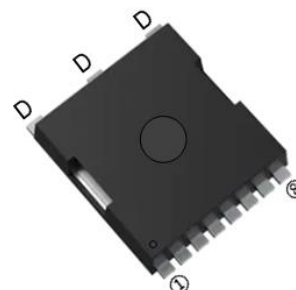


RoHS Compliant Product
A suffix of "-C" specifies halogen & lead-free

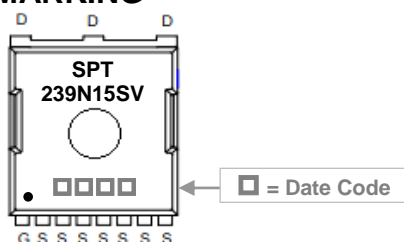
FEATURES

- Shielded Gate Trench Technology
- High Speed Power Smooth Switching
- Enhanced Body diode dv/dt capability
- 100% UIS Tested, 100% R_g Tested
- Super Low Gate Charge
- Green Device Available

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MARKING

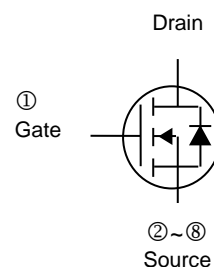


PACKAGE INFORMATION

Package	MPQ	Leader Size
TOLL-8	2K	13 inch

ORDER INFORMATION

Part Number	Type
SPT239N15SV-C	Lead (Pb)-free and Halogen-free



ABSOLUTE MAXIMUM RATINGS ($T_J=25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Ratings	Unit
Drain-Source Voltage	V_{DS}	150	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current ¹ (Silicon Limited)	I_D	$T_C=25^\circ\text{C}$	239
		$T_C=100^\circ\text{C}$	169
Pulsed Drain Current ²	I_{DM}	800	A
Power Dissipation	P_D	$T_C=25^\circ\text{C}$ 600	W
Operating Junction & Storage Temperature Range	T_J, T_{STG}	-55~175	$^\circ\text{C}$
Thermal Resistance Ratings			
Thermal Resistance Junction-Ambient ¹	$R_{\theta JA}$	60	$^\circ\text{C/W}$
Thermal Resistance Junction-Case ¹	$R_{\theta JC}$	0.25	

ELECTRICAL CHARACTERISTICS ($T_J=25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions	
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	150	-	-	V	$V_{GS}=0V, I_D=250\mu A$	
Gate-Threshold Voltage	$V_{GS(th)}$	2	-	4	V	$V_{DS}=V_{GS}, I_D=250\mu A$	
Forward Transfer Conductance ²	g_{fs}	-	70	-	S	$V_{DS}=5V, I_D=20A$	
Gate-Source Leakage Current	I_{GSS}	-	-	± 100	nA	$V_{GS}=\pm 20V, V_{DS}=0V$	
Drain-Source Leakage Current	I_{DSS}	$T_J=25^\circ\text{C}$	-	-	1	uA	$V_{DS}=150V, V_{GS}=0V$
		$T_J=100^\circ\text{C}$	-	-	100		
Static Drain-Source On-Resistance ³	$R_{DS(ON)}$	-	3.8	4.5	m Ω	$V_{GS}=10V, I_D=20A$	
Gate Resistance	R_g	-	1.3	-	Ω	$f=1\text{MHz}$	
Total Gate Charge	Q_g	-	73	-	nC	$I_D=20A$ $V_{DD}=75V$ $V_{GS}=10V$	
Gate-Source Charge	Q_{gs}	-	27	-			
Gate-Drain Charge	Q_{gd}	-	10	-			
Turn-on Delay Time	$T_{d(on)}$	-	22	-	nS	$V_{DD}=75V$ $I_D=20A$ $V_{GS}=10V$ $R_G=10\Omega$	
Rise Time	T_r	-	18	-			
Turn-off Delay Time	$T_{d(off)}$	-	34	-			
Fall Time	T_f	-	13	-			
Input Capacitance	C_{iss}	-	5857	-	pF	$V_{GS}=0V$ $V_{DS}=75V$ $f=1\text{MHz}$	
Output Capacitance	C_{oss}	-	773	-			
Reverse Transfer Capacitance	C_{rss}	-	9.4	-			
Source-Drain Diode							
Diode Forward Voltage ³	V_{SD}	-	0.9	-	V	$I_F=20A, V_{GS}=0V$	
Reverse Recovery Time	t_{rr}	-	115	-	nS	$I_F=20A, V_R=75V,$	
Reverse Recovery Charge	Q_{rr}	-	334	-	nC	$di/dt=100A/\mu s$	

Notes:

1. The data tested by surface mounted on a 1 inch² FR-4 board with 2oz copper.
2. The Pulse width limited by maximum junction temperature, Pulse Width $\leq 10\mu s$, Duty Cycle $\leq 2\%$.
3. The Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.

CHARACTERISTIC CURVES

Fig 1. Typical Output Characteristics

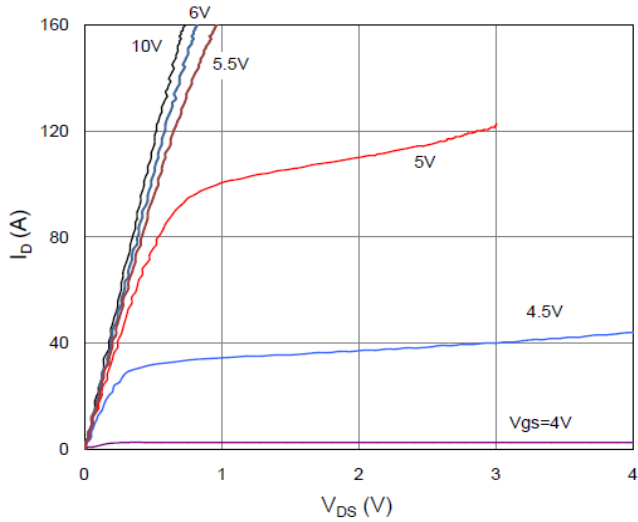


Figure 2. On-Resistance vs. Gate-Source Voltage

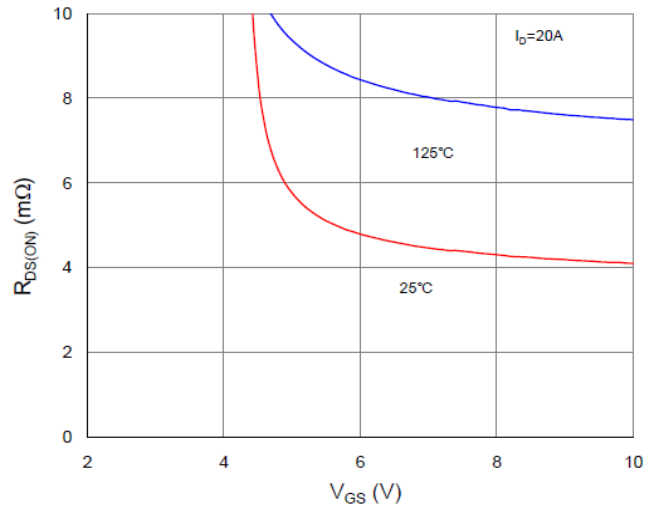


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

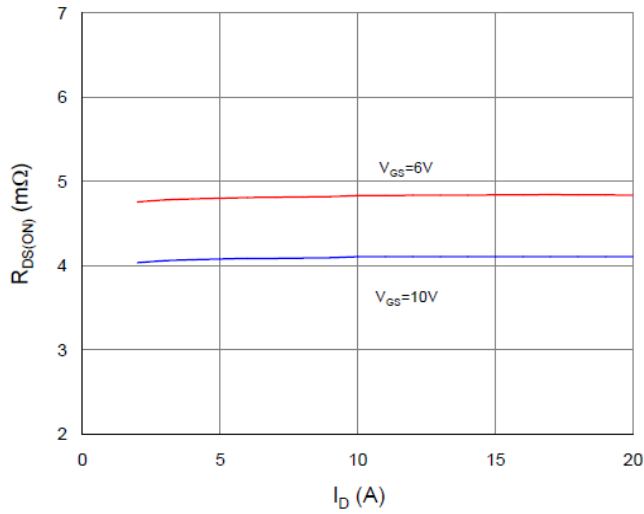


Figure 4. Normalized On-Resistance vs. Junction Temperature

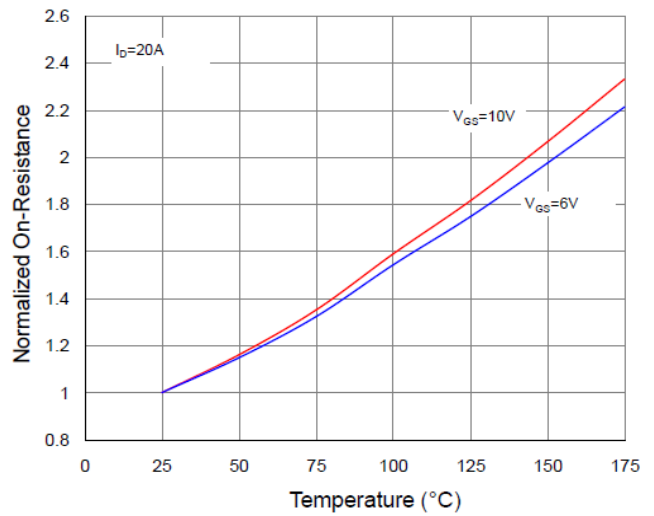


Figure 5. Typical Transfer Characteristics

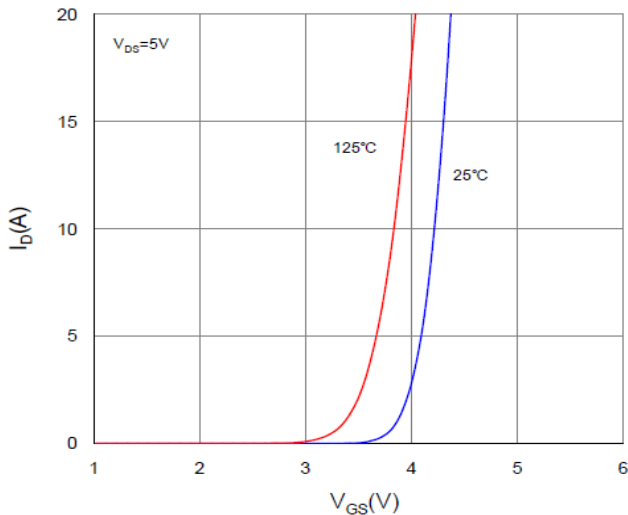
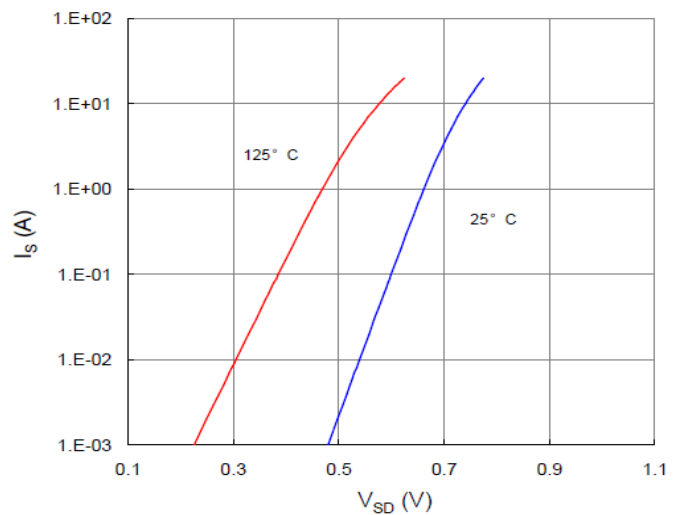


Figure 6. Typical Source-Drain Diode Forward Voltage



CHARACTERISTIC CURVES

Figure 7. Typical Gate-Charge vs. Gate-to-Source Voltage

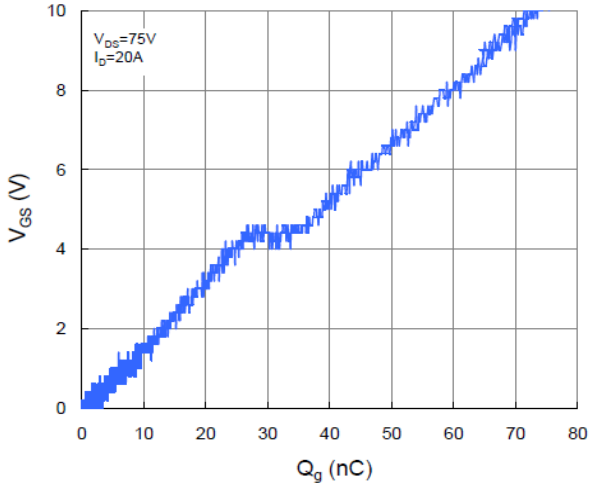


Figure 8. Typical Capacitance vs. Drain-to-Source Voltage

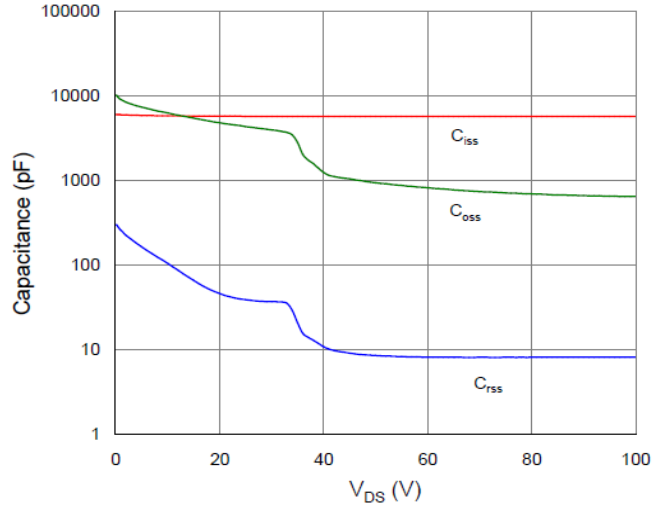


Figure 9. Maximum Safe Operating Area

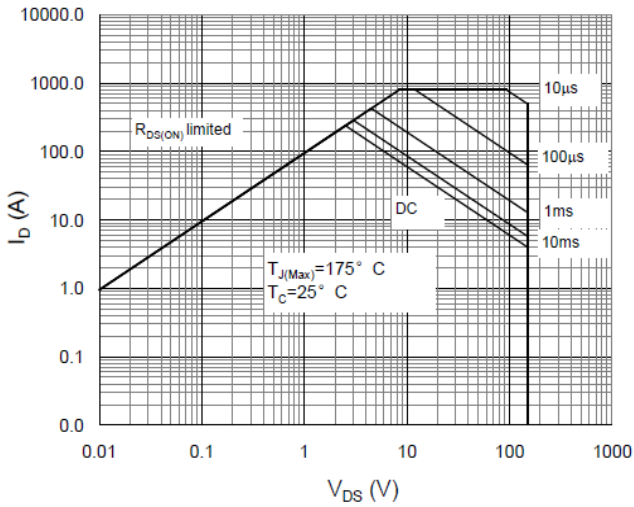


Figure 10. Maximum Drain Current vs. Case Temperature

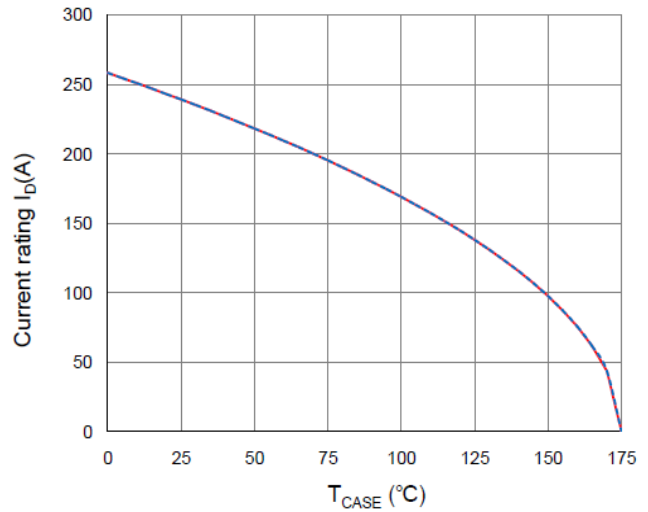
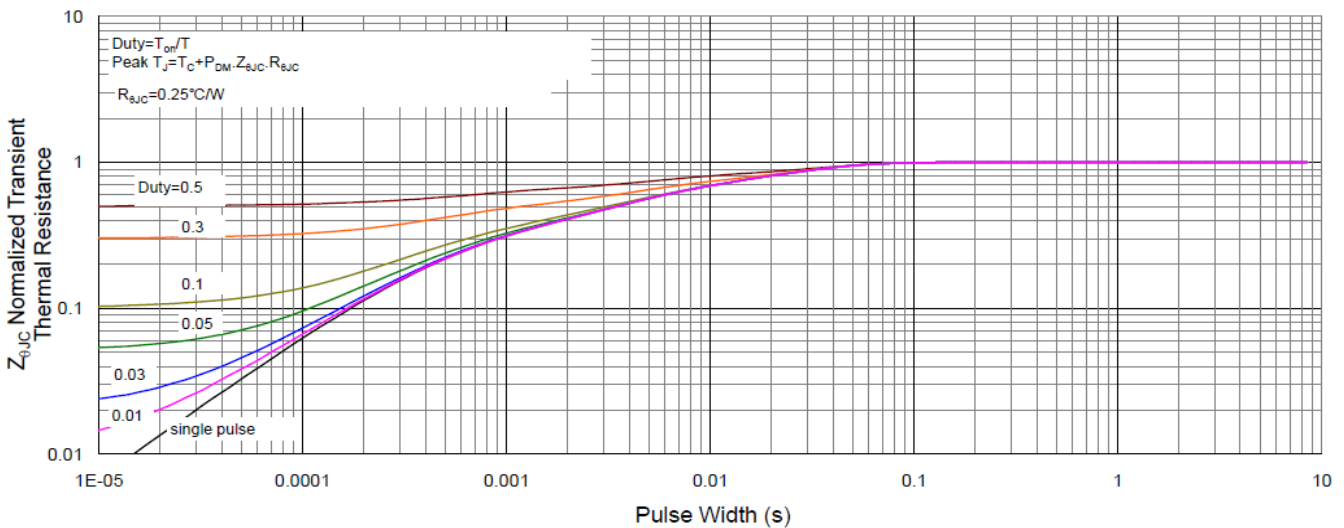
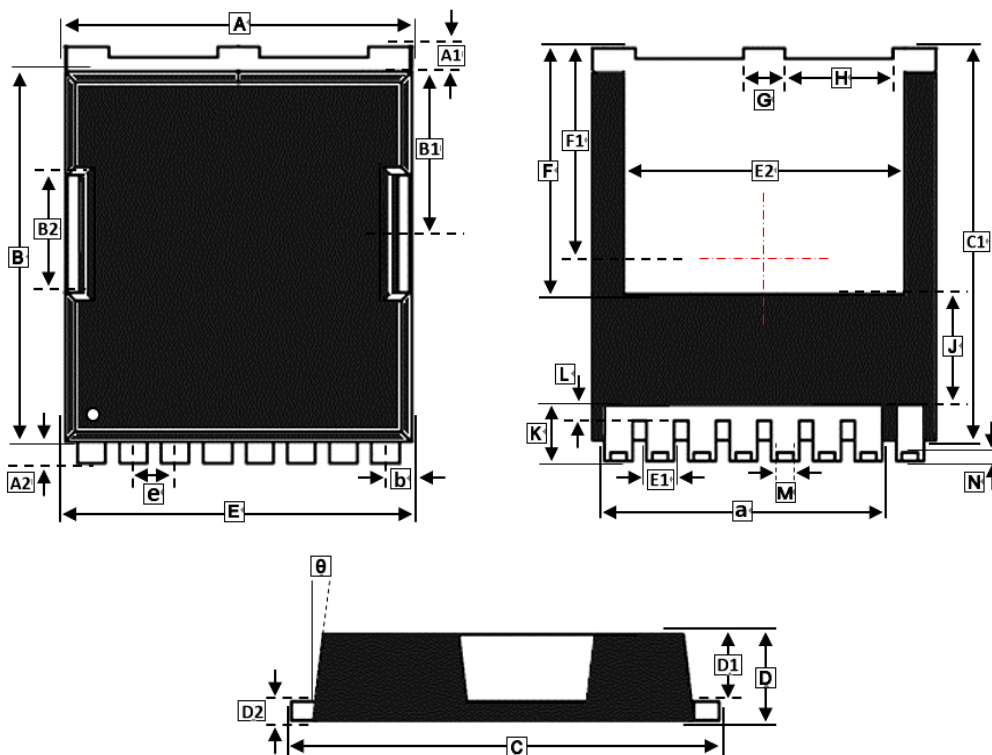


Figure 11. Normalized Maximum Transient Thermal Impedance, Junction-to-Case



PACKAGE OUTLINE DIMENSIONS

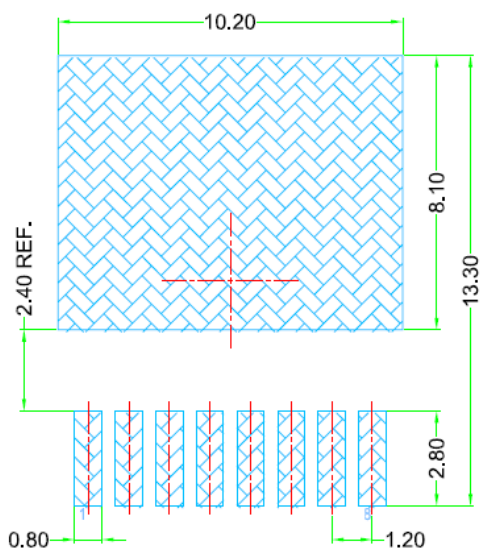
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REF.	Millimeter	
	Min.	Max.
A	9.70	9.90
A1	0.60	0.80
A2	0.50	0.70
B	10.28	10.48
B1	4.45	4.65
B2	3.20	3.40
C	11.58	11.78
C1	10.98	11.18
D	2.20	2.40
D1	1.70	1.90
D2	0.40	0.60
E	9.80	10.00
E1	0.70	0.90
E2	8.00	8.20
F	6.95 BSC.	
F1	5.89 BSC.	
G	1.10	1.30
H	3.00	3.20
J	2.80 REF.	
K	1.40	2.10
L	0.30	0.80
M	0.46 REF.	
N	0.10 REF.	
theta	10° REF.	
a	8.00 REF.	
b	0.60	0.80
e	1.20 BSC.	

MOUNTING PAD LAYOUT

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*Dimensions in millimeters