Elektronische Bauelemente

SPT446N10SV-C

446A, 100V, $R_{DS(ON)}$ 1.5mΩ

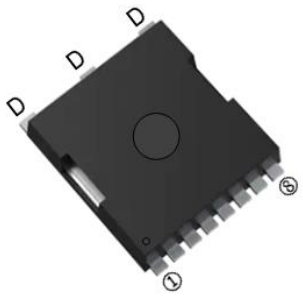
N-Channel Shielded Gate Trench Power MOSFET

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

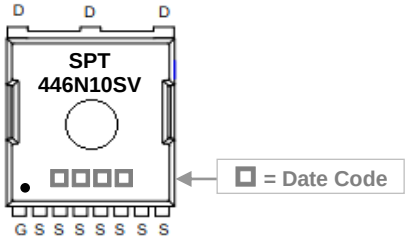
FEATURES

- 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

TOLL-8

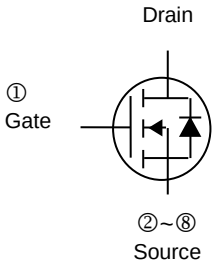


MARKING



PACKAGE INFORMATION

Package	MPQ	Leader Size
TOLL-8	2K	13 inch



ORDER INFORMATION

Part Number	Type
SPT446N10SV-C	Lead (Pb)-free and Halogen-free

ABSOLUTE MAXIMUM RATINGS (T_J=25°C unless otherwise specified)

Parameter		Symbol	Ratings	Unit
Drain-Source Voltage		V_{DS}	100	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current [4] (Silicon Limited)	T_C=25°C	I_D	446	A
	T_C=100°C		316	
Continuous Drain Current [1] (Package Limited)	T_C=25°C		360	
	T_A=25°C		36	
Pulsed Drain Current [2]		I_{DM}	1500	A
Single Pulse Avalanche Energy [5]		E_{AS}	1512	mJ
Power Dissipation	T_C=25°C	P_D	600	W
	T_A=25°C		2.5	
Operating Junction & Storage Temperature Range		T_J, T_{STG}	-55~175	°C
Thermal Resistance Ratings				
Thermal Resistance Junction-Ambient [1]		$R_{\theta JA}$	60	°C/W
Thermal Resistance Junction-Case [1]		$R_{\theta JC}$	0.25	

ELECTRICAL CHARACTERISTICS (T_J=25°C unless otherwise specified)

Parameter		Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Drain-Source Breakdown Voltage		$V_{(BR)DSS}$	100	-	-	V	V_{GS}=0V, I_D=250μA
Gate-Threshold Voltage		$V_{GS(th)}$	2	-	4	V	V_{DS}=V_{GS}, I_D=250μA
Forward Transfer Conductance [2]		g_{fs}	-	80	-	S	V_{DS}=5V, I_D=20A
Gate-Source Leakage Current		I_{GSS}	-	-	±100	nA	V_{GS}=±20V, V_{DS}=0V
Drain-Source Leakage Current	T_J=25°C	I_{DSS}	-	-	1	uA	V_{DS}=100V, V_{GS}=0V
	T_J=100°C		-	-	100		
Static Drain-Source On-Resistance [3]		$R_{DS(ON)}$	-	1.3	1.5	mΩ	V_{GS}=10V, I_D=20A
Gate Resistance		R_g	-	0.94	-	Ω	f=1MHz
Total Gate Charge		Q_g	-	140	-	nC	I_D=20A V_{DD}=50V V_{GS}=10V
Gate-Source Charge		Q_{gs}	-	36	-		
Gate-Drain Change		Q_{gd}	-	24	-		
Turn-on Delay Time		$T_{d(on)}$	-	30	-	nS	V_{DD}=50V I_D=20A V_{GS}=10V R_G=10Ω
Rise Time		T_r	-	32	-		
Turn-off Delay Time		$T_{d(off)}$	-	48	-		
Fall Time		T_f	-	18	-		
Input Capacitance		C_{iss}	-	10920	-	pF	V_{GS}=0V V_{DS}=50V f=1MHz
Output Capacitance		C_{oss}	-	2657	-		
Reverse Transfer Capacitance		C_{rss}	-	52	-		
Source-Drain Diode							
Diode Forward Voltage [3]		V_{SD}	-	0.9	1.2	V	I_F=20A, V_{GS}=0V
Reverse Recovery Time		t_{rr}	-	85	-	nS	I_F=20A, V_R=50V, dI_F/dt=100A/μs
Reverse Recovery Charge		Q_{rr}	-	137	-	nC	

Notes:

1. The data tested by surface mounted on a 1 inch^2 FR-4 board with 2oz copper.
2. Pulse Width≤10μs, Duty Cycle≤2%.
3. The Pulse Test: Pulse Width≤300μs, Duty Cycle≤2%.
4. The Pulse width limited by maximum junction temperature.
5. The EAS data shows Max. Rating. The test condition is V_{DD}=50V, V_{GS}=10V, L=1mH, I_{AS}=55A

CHARACTERISTIC CURVES

Fig 1. Typical Output Characteristics

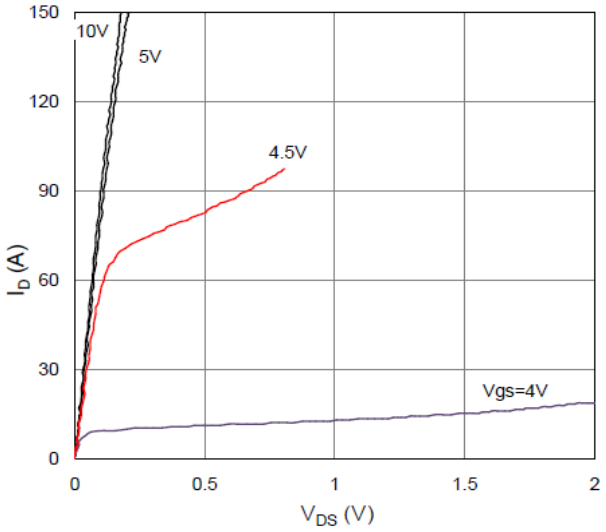


Figure 2. On-Resistance vs. Gate-Source Voltage

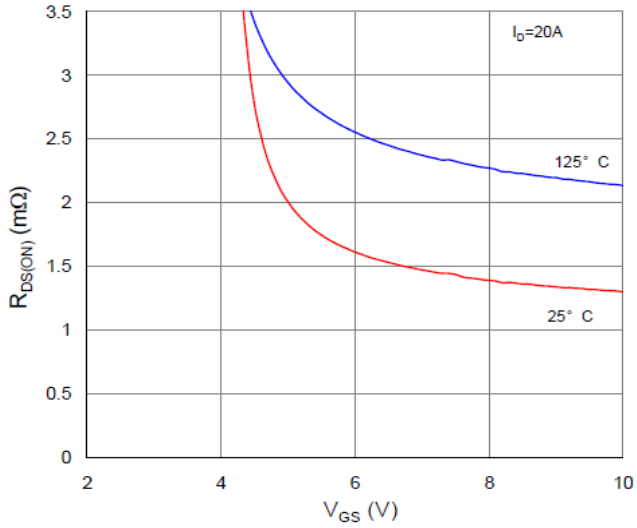


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

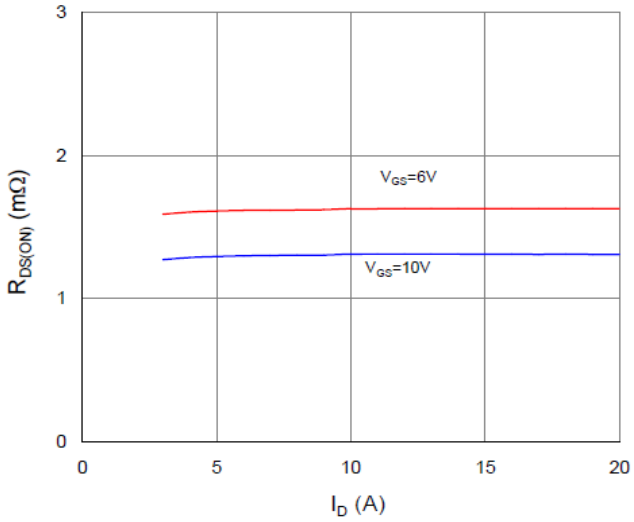


Figure 4. Normalized On-Resistance vs. Junction Temperature

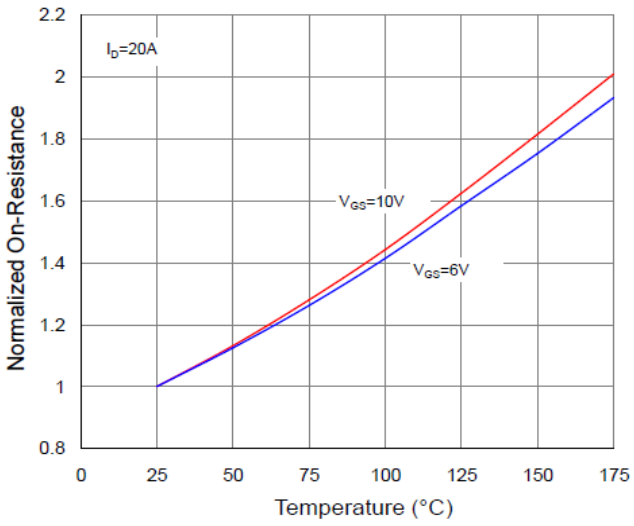


Figure 5. Typical Transfer Characteristics

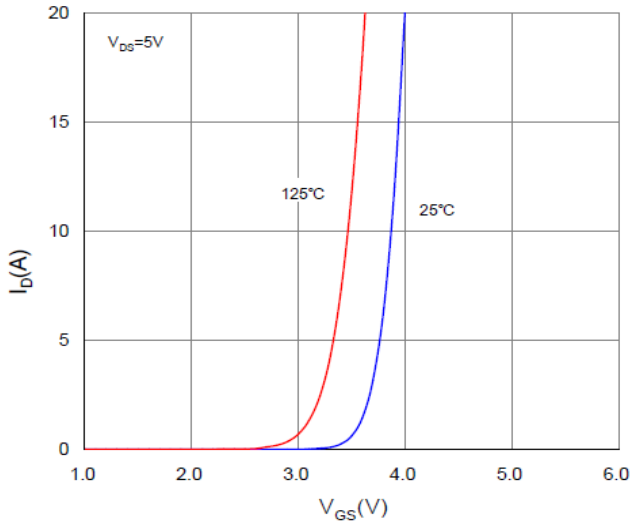
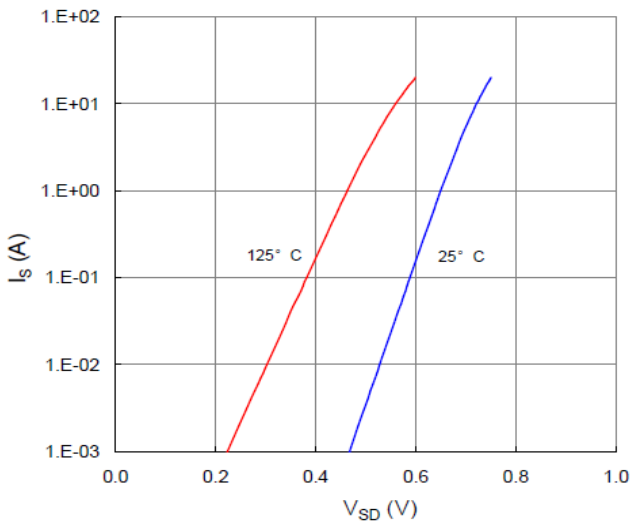


Figure 6. Typical Source-Drain Diode Forward Voltage



CHARACTERISTIC CURVES

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

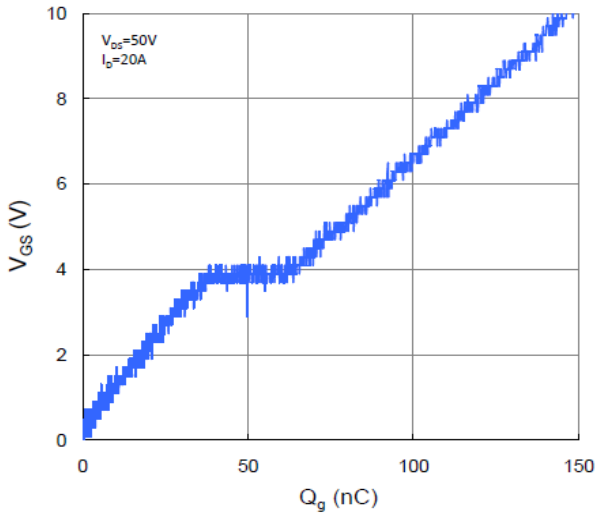


Figure 8. Typical Capacitance vs. Drain-to-Source Voltage

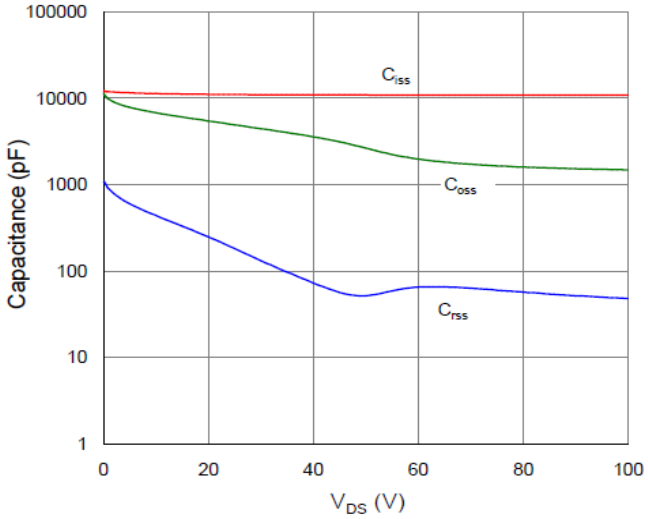


Figure 9. Maximum Safe Operating Area

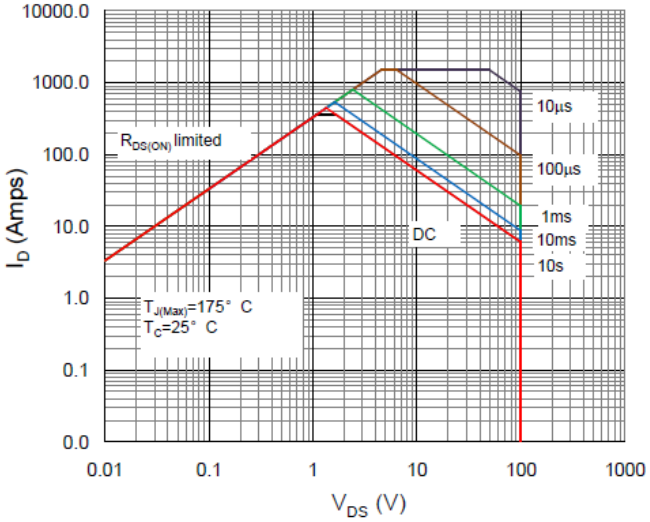


Figure 10. Maximun Drain Current vs. Case Temperature

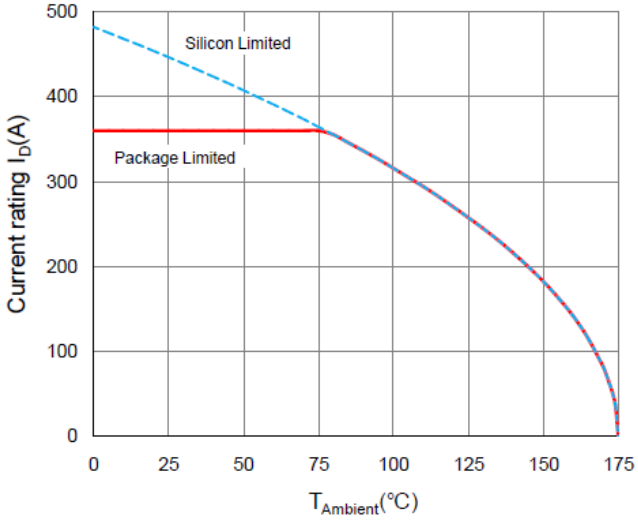
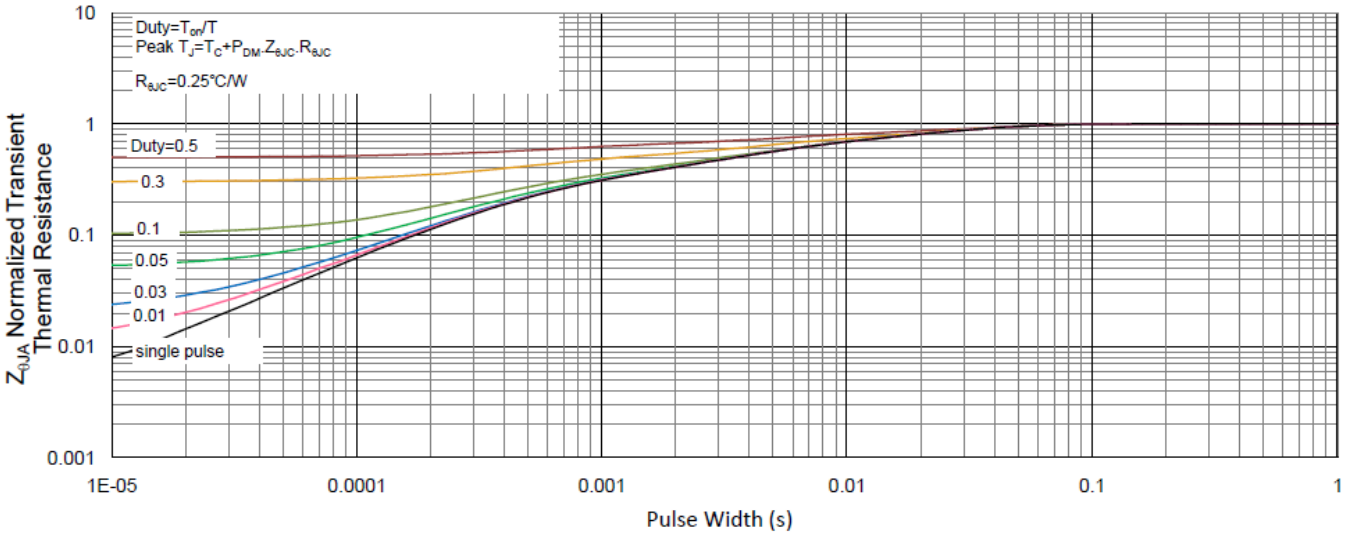
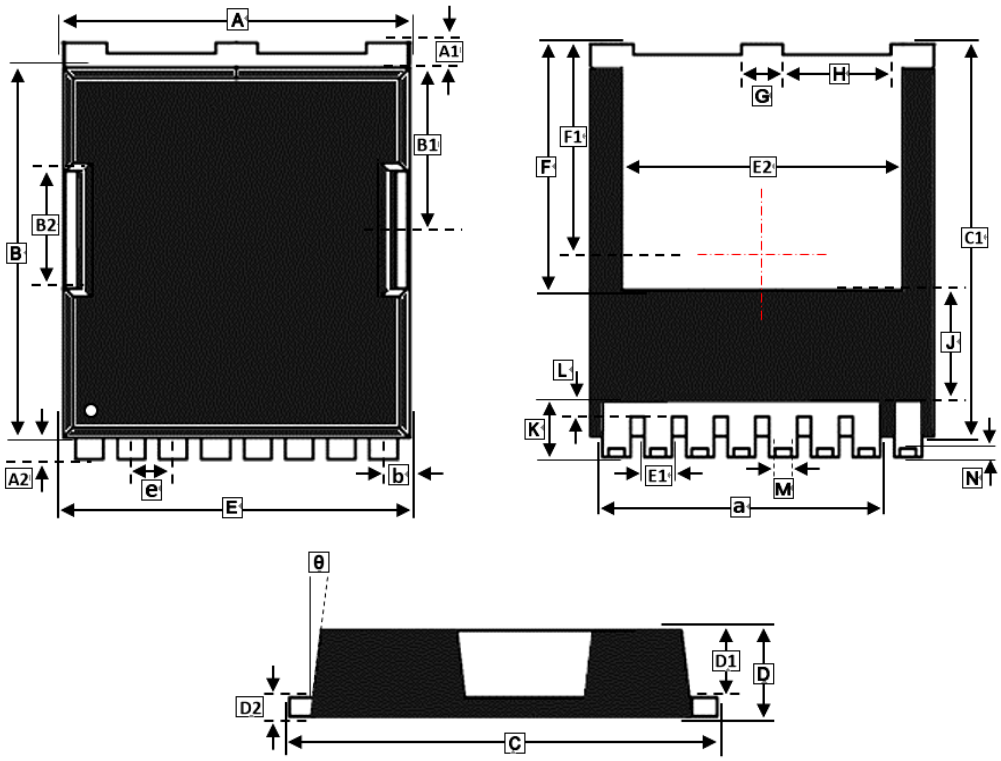


Figure 11. Normalized Maximum Transient Thermal Impedance, Junction-to-Ambient



PACKAGE OUTLINE DIMENSIONS

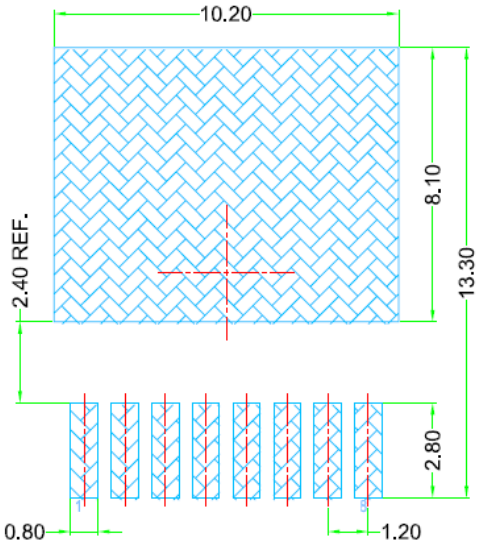
TOLL-8



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.	
θ	10° REF.	
a	8.00 REF.	
b	0.60	0.80
e	1.20 BSC.	

MOUNTING PAD LAYOUT

TOLL-8



*Dimensions in millimeters