SSP45N10
45A , 100V , $R_{DS(ON)}$ 22 mΩ
N-Channel Enhancement Mode MOSFET

SeCoS
**Elektronische Bauelemente**

DESCRIPTION

The SSP45N10 is the highest performance trench N-ch MOSFETs with extreme high cell density , which provide excellent $R_{DS(ON)}$ and gate charge for most of the synchronous buck converter applications .The SSP45N10 meet the RoHS and Green Product requirement , 100% EAS guaranteed with full function reliability approved.

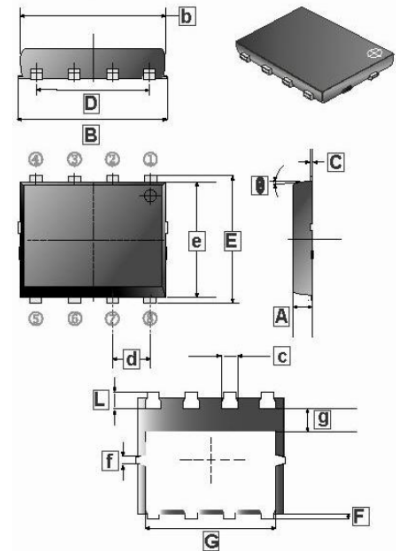## FEATURES

- Simple Drive Requirement
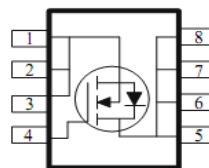- Small Package Outline

MARKING

45N10
☐☐☐☐ ← ☐ = Date Code
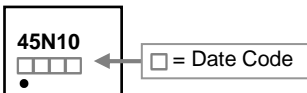
PACKAGE INFORMATION

Package	MPQ	Leader Size
SOP-8PP	3K	13 inch

SOP-8PP

TOP VIEW

REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	0.80	1.00	θ	0°	10°
B	5.3 BSC.		b	5.2 BCS	
C	0.15	0.25	c	0.20	0.50
D	3.8 BCS.		d	1.27BSC	
E	6.05 BCS.		e	5.65 BCS.	
F	0.03	0.30	f	0.10	0.40
G	4.35 BCS.		g	1.3 BCS.	
L	0.40	0.70			

ABSOLUTE MAXIMUM RATINGS (T_A=25℃ unless otherwise specified)

Parameter		Symbol	Ratings	Unit
Drain-Source Voltage		V_{DS}	100	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current [1] , V_{GS}@10V	T_C=25℃	I_D	45	A
	T_C=100℃		28	
Pulsed Drain Current [2]	T_C=25℃	I_{DM}	100	A
Power Dissipation [4]	T_C=25℃	P_D	90	W
Single Pulse Avalanche Energy [3]		E_{AS}	98	mJ
Single Pulse Avalanche Current		I_{AS}	41	A
Operating Junction and Storage Temperature Range		T_j, T_{stg}	-55~150	℃
Thermal Resistance Rating				
Maximum Junction to Case [1]		$R_{θJC}$	1.4	℃ / W
Maximum Junction to Ambient [1]		$R_{θJA}$	36	℃ / W

seCoS
Elektronische Bauelemente

ELECTRICAL CHARACTERISTICS (T$_A$=25°C unless otherwise specified)

Parameter		Symbol	Min.	Typ.	Max.	Unit	Teat Conditions
Static							
Drain-Source Breakdown Voltage		BV$_{DSS}$	100	-	-	V	V$_{GS}$=0, I$_D$=250µA
Gate-Threshold Voltage		V$_{GS(th)}$	2.5	-	4.5	V	V$_{DS}$=V$_{GS}$, I$_D$=250µA
Forward Transconductance		g$_{fs}$	-	27	-	S	V$_{DS}$=5V, I$_D$=30A
Gate Resistance		R$_G$	-	1.9	3.8	Ω	f=1MHz
Gate-Body Leakage Current		I$_{GSS}$	-	-	±100	nA	V$_{GS}$=±20V
Drain-Source Leakage Current	T$_J$=25°C	I$_{DSS}$	-	-	1	µA	V$_{DS}$=80V, V$_{GS}$=0
	T$_J$=55°C		-	-	5		V$_{DS}$=80V, V$_{GS}$=0
Drain-Source On-Resistance [2]		R$_{DS(ON)}$	-	19	22	mΩ	V$_{GS}$=10V, I$_D$=30A
			-	25	30		V$_{GS}$=7V, I$_D$=15A
Dynamic							
Total Gate Charge		Q$_g$	-	27.6	-	nC	V$_{DS}$=80V, V$_{GS}$=10V, I$_D$=30A
Gate-Source Charge		Q$_{gs}$	-	11.4	-		
Gate-Drain ("Miller") Charge		Q$_{gd}$	-	7.9	-		
Turn-on Delay Time [2]		T$_{d(on)}$	-	15.6	-	nS	V$_{DD}$=50V, V$_{GS}$=10V, R$_G$=3.3Ω, I$_D$=30A
Rise Time		T$_r$	-	17.2	-		
Turn-off Delay Time		T$_{d(off)}$	-	16.8	-		
Fall Time		T$_f$	-	9.2	-		
Input Capacitance		C$_{iss}$	-	1890	-	pF	V$_{GS}$=0, V$_{DS}$=15V, f=1.0MHz
Output Capacitance		C$_{oss}$	-	268	-		
Reverse Transfer Capacitance		C$_{rss}$	-	67	-		
Guaranteed Avalanche Chatacteristics							
Single Pulse Avalanche Energy [5]		EAS	53	-	-	mJ	V$_{DD}$=50V, L=0.1mH, I$_{AS}$=30A
Source-Drain Diode							
Diode Forward Voltage [2]		V$_{SD}$	-	-	1	V	I$_S$=1A, V$_{GS}$=0
Continuous Source Current [1.6]		I$_S$	-	-	45	A	V$_D$=V$_G$=0, Force Current
Pulsed Source Current [2.6]		I$_{SM}$	-	-	100	A	
Reverse Recovery Time		T$_{RR}$	-	34	-	ns	I$_F$=30A, T$_J$=25°C dI/dt=100A/µs
Reverse Recovery Charge		Q$_{RR}$	-	47	-	nC	

Notes:
1. The data tested by surface mounted on a 1 inch2 FR-4 board with 2OZ copper , ≦10sec , 125°C/W at steady state
2. The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%
3. The EAS data shows Max. rating . The test condition is V$_{DD}$=25V, V$_{GS}$=10V, L=0.1mH, I$_{AS}$=53.8A
4. The power dissipation is limited by 150°C junction temperature
5. The Min. value is 100% EAS tested guarantee.
6. The data is theoretically the same as ID and IDM , in real applications , should be limited by total power dissipation
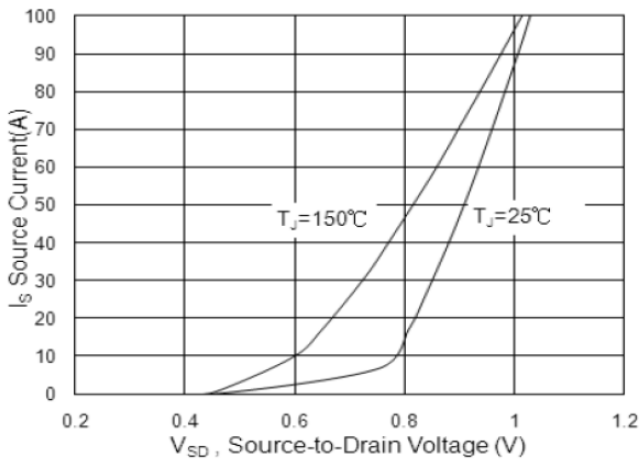
SeCoS
Elektronische Bauelemente
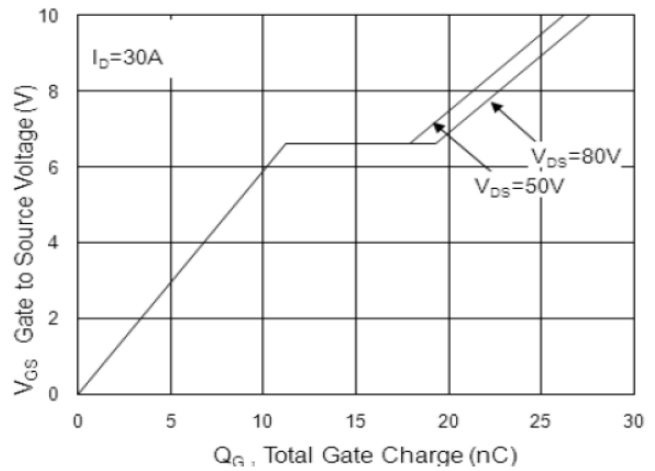
CHARACTERISTIC CURVES
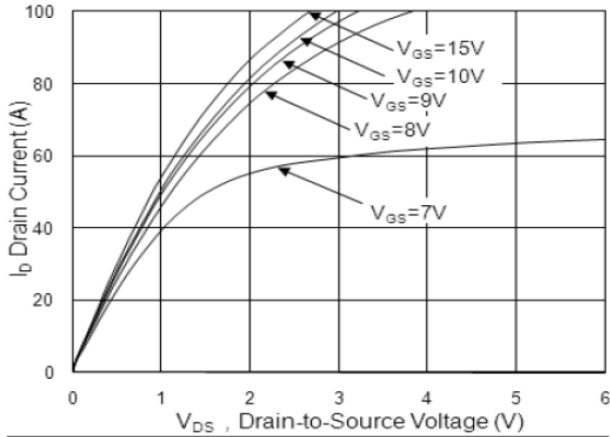
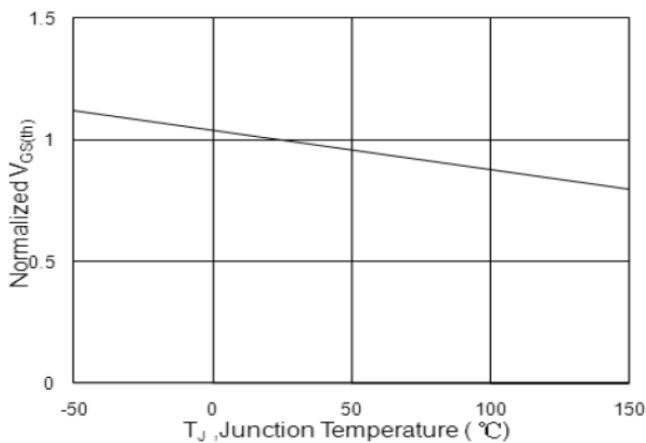**Fig.1 Typical Output Characteristics**
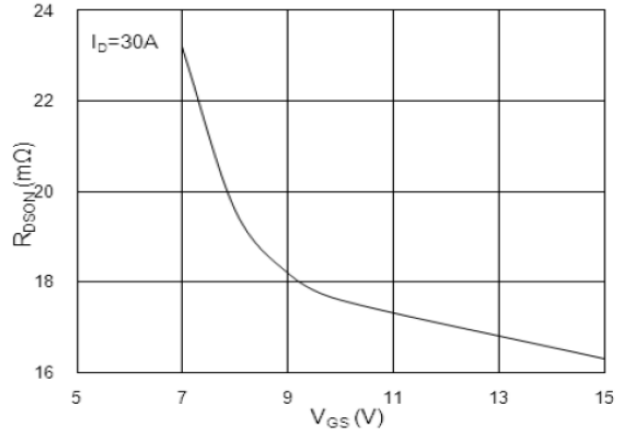
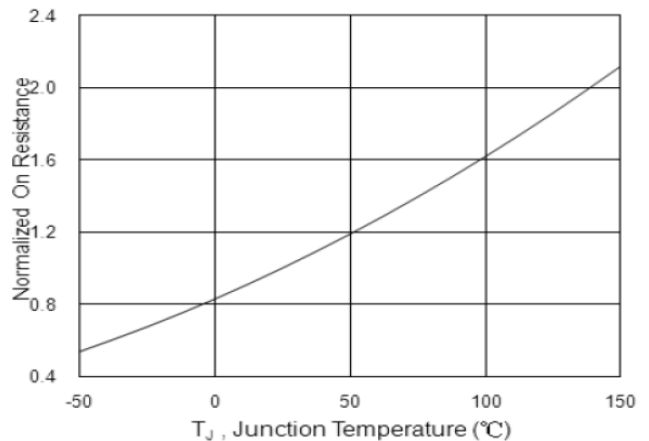**Fig.2 On-Resistance v.s Gate-Source**

Fig.3 Forward Characteristics of Reverse

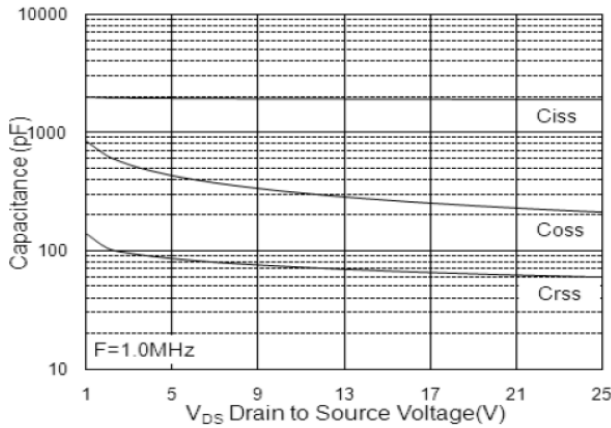**Fig.4 Gate-Charge Characteristics**
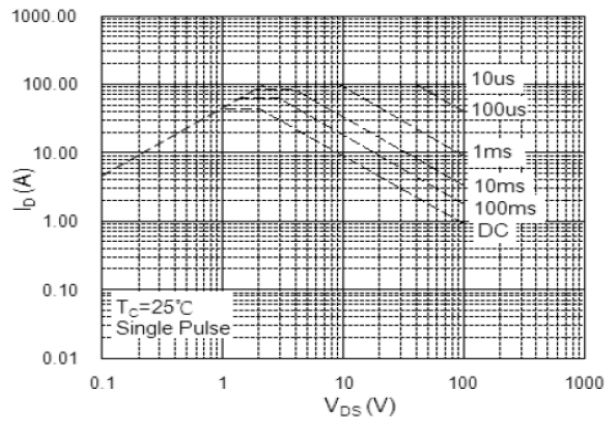

Fig.5 Normalized $V_{GS(th)}$ v.s T_J
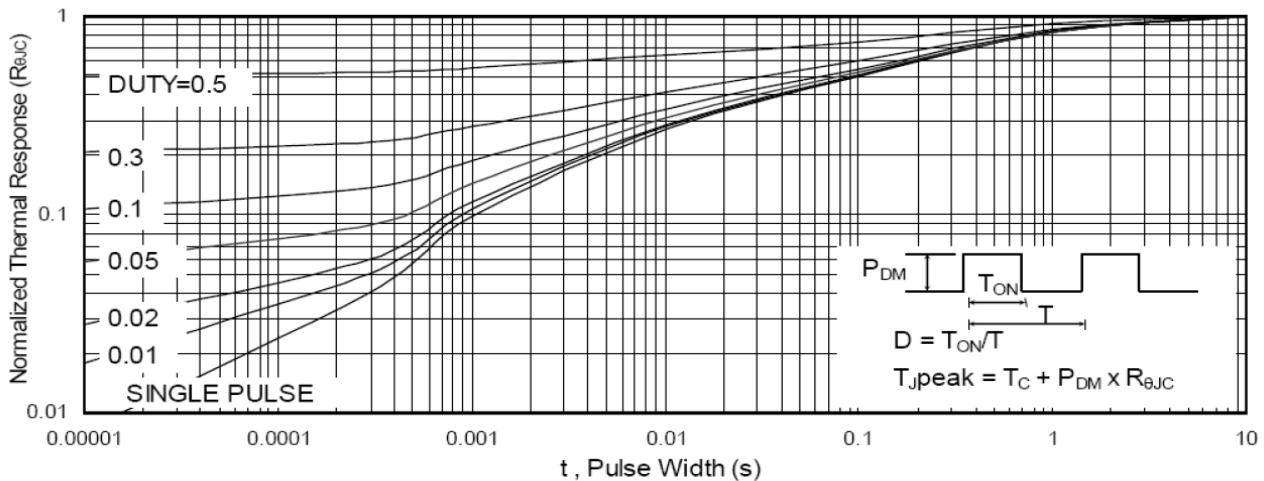

Fig.6 Normalized R_{DSON} v.s T_J

SeCoS
Elektronische Bauelemente

CHARACTERISTIC CURVES

Fig.7 Capacitance

Fig.8 Safe Operating Area

$D = T_{ON}/T$

$T_J peak = T_C + P_{DM} \times R_{\theta JC}$

Fig.9 Normalized Maximum Transient Thermal Impedance
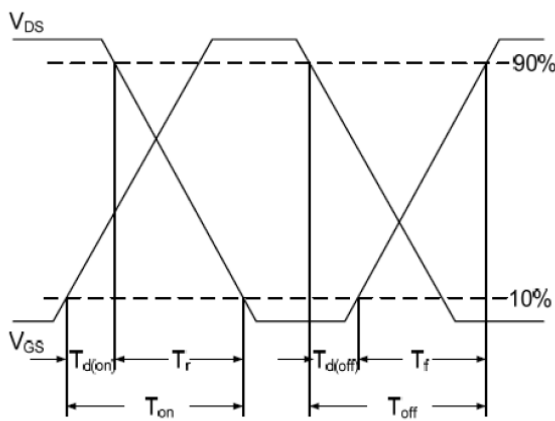
Fig.10 Switching Time Waveform

$$EAS = \frac{1}{2}L \times I_{AS}^2 \times \frac{BV_{DSS}}{BV_{DSS}-V_{DD}}$$
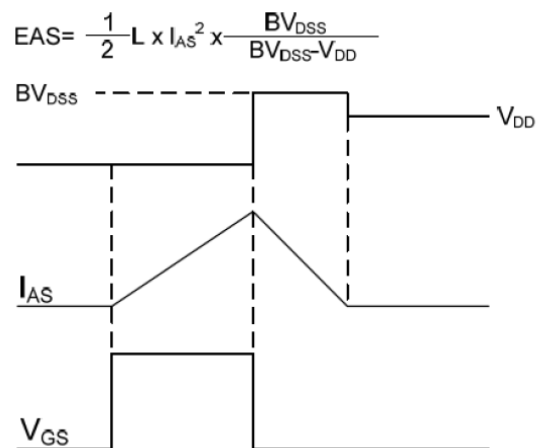
Fig.11 Unclamped Inductive Switching Waveform