



## SSCV13N500GT2

### N-Channel Enhancement Mode Power MOSFET

#### ➤ Features

$V_{DS}$	$V_{GS}$	$R_{DS(ON)}$ Typ.	$I_D$
500V	$\pm 30V$	$0.47\Omega@10V$	13A

#### ➤ Description

- This device is N-Channel enhancement MOSFET.
- Fast Switching.
- Improved dv/dt Capability.

**100% UIS +  $\Delta V_{DS}$  +  $R_g$  Tested!**

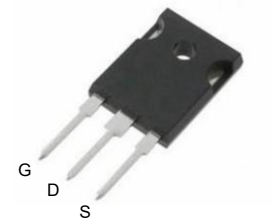
#### ➤ Applications

- Uninterruptible Power Supply (UPS)
- Switch Mode Power Supply
- TV Power

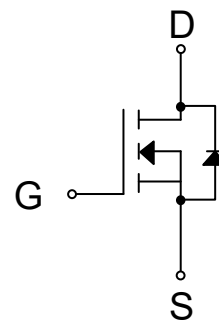
#### ➤ Ordering Information

Device	Package	Shipping
SSCV13N500GT2	TO-247-3L	30/Tube

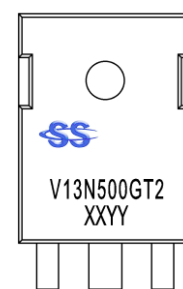
#### ➤ Pin Configuration



**TO-247-3L (Top View)**



**Pin Configuration**



#### **Marking**

(XYY: Internal Traceability Code)



➤ **Absolute Maximum Ratings ( $T_J=25^{\circ}\text{C}$  unless otherwise noted)**

Symbol	Parameter		Ratings	Unit
$V_{DS}$	Drain-to-Source Voltage		500	V
$V_{GS}$	Gate-to-Source Voltage		$\pm 30$	V
$I_D$	Continuous Drain Current	$T_J=25^{\circ}\text{C}$	13	A
		$T_J=100^{\circ}\text{C}$	8.5	
$I_{DM}$	Pulsed Drain Current <sup>a</sup>		52	A
$E_{AS}$	Single Pulsed Avalanche Energy		259	mJ
$P_D$	Power Dissipation, $T_J=25^{\circ}\text{C}$		179	W
$T_{STG} / T_J$	Junction & Storage Temperature Range		-55 to 150	$^{\circ}\text{C}$

➤ **Thermal Resistance Ratings ( $T_J=25^{\circ}\text{C}$  unless otherwise noted)**

Symbol	Parameter	Ratings	Unit
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient <sup>b</sup>	60	$^{\circ}\text{C}/\text{W}$
$R_{\theta JC}$	Thermal Resistance, Junction to Case	0.7	

Note:

- Repetitive Rating: Pulsed width limited by maximum junction temperature.
- $R_{\theta JA}$  is measured with the device mounted on a minimum recommended pad of 2oz copper FR4 PCB.



# SSCV13N500GT2

## ➤ Electrical Characteristics (T<sub>J</sub>=25°C unless otherwise noted)

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Drain-Source Breakdown Voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> = 0V, I <sub>D</sub> = 250μA	500			V
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> = 600V, V <sub>GS</sub> = 0V			1.0	μA
Gate-Source Leak Current	I <sub>GSS</sub>	V <sub>GS</sub> = ±30V, V <sub>DS</sub> = 0V			±100	nA
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250μA	2	3	4	V
Drain-Source On-Resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> = 10V, I <sub>D</sub> = 6.5A		0.47	0.55	Ω
Input Capacitance	C <sub>ISS</sub>	V <sub>DS</sub> = 25V, V <sub>GS</sub> = 0V, f = 1MHz		1650		pF
Output Capacitance	C <sub>OSS</sub>			160		
Reverse Transfer Capacitance	C <sub>RSS</sub>			15		
Total Gate Charge	Q <sub>G</sub>	V <sub>GS</sub> = 0 to 10V, V <sub>DS</sub> = 400V, I <sub>D</sub> = 13A		35		nC
Gate to Source Charge	Q <sub>GS</sub>			7		
Gate to Drain Charge	Q <sub>GD</sub>			18		
Turn-on Delay Time	T <sub>D(ON)</sub>	V <sub>DS</sub> = 250V, I <sub>D</sub> = 13A, R <sub>G</sub> = 25Ω		23		ns
Rise Time	T <sub>r</sub>			15		
Turn-off Delay Time	T <sub>D(OFF)</sub>			90		
Fall Time	T <sub>f</sub>			30		
Maximum Continuous Drain to Source Diode Forward Current	I <sub>S</sub>				13	A
Maximum Pulsed Drain to Source Diode Forward Current	I <sub>SM</sub>				52	A
Drain to Source Diode Forward Voltage	V <sub>SD</sub>	V <sub>GS</sub> = 0V, I <sub>S</sub> = 13A			1.4	V
Body Diode Reverse Recovery Time	T <sub>rr</sub>	I <sub>F</sub> = 13A, di/dt = 100A/μs V <sub>R</sub> =400V		320		ns
Body Diode Reverse Recovery Charge	Q <sub>rr</sub>			4.2		μC



➤ Typical Performance Characteristics ( $T_J=25^\circ\text{C}$  unless otherwise noted)

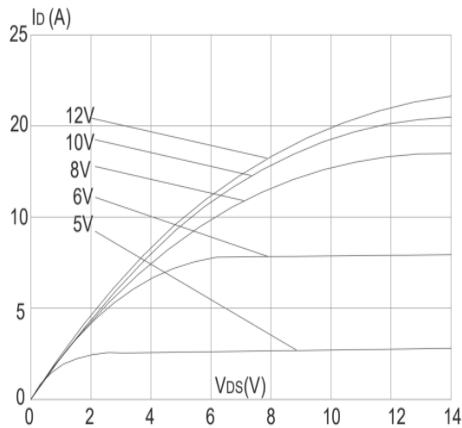


Figure 1: Output Characteristics

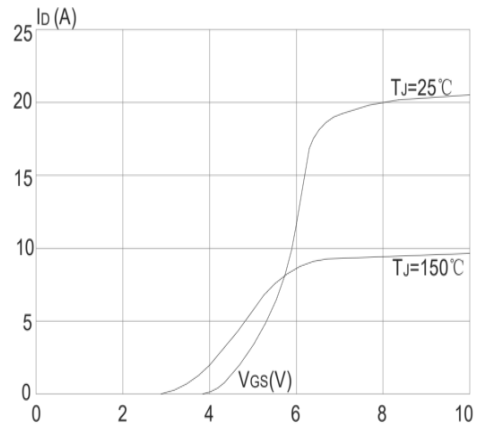


Figure 2: Typical Transfer Characteristics

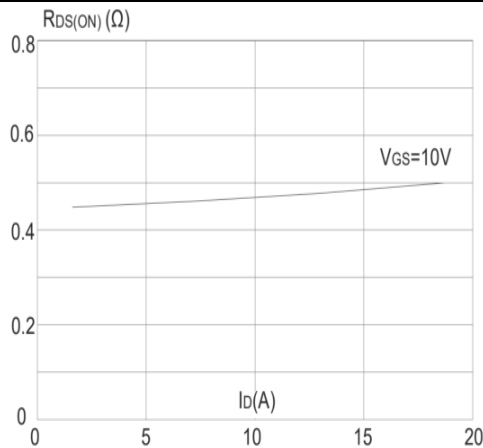


Figure 3: On-resistance vs. Drain Current

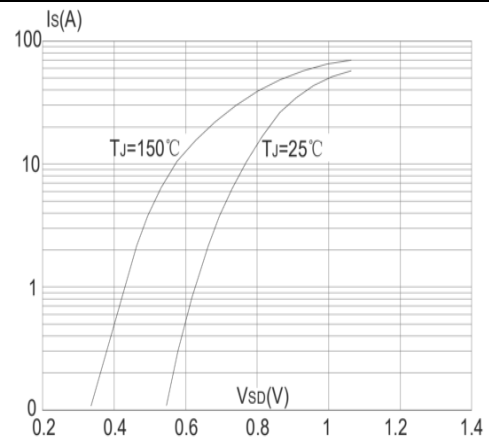


Figure 4: Body Diode Characteristics

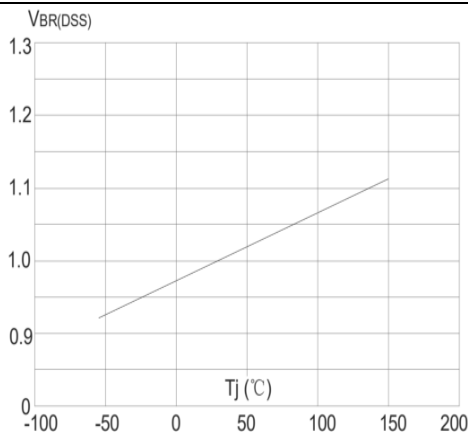


Figure 5: Normalized Breakdown voltage vs.  
Junction Temperature

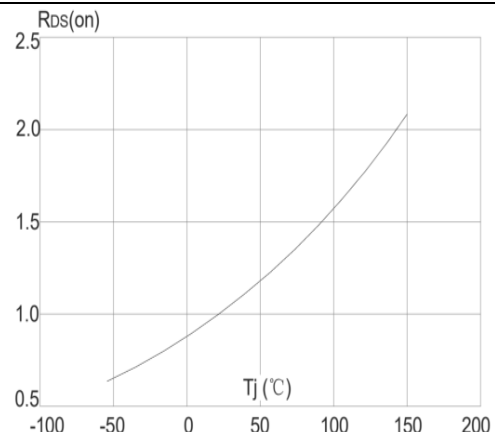


Figure 6: Normalized on Resistance vs.  
Junction Temperature



➤ Typical Performance Characteristics ( $T_J=25^\circ\text{C}$  unless otherwise noted)

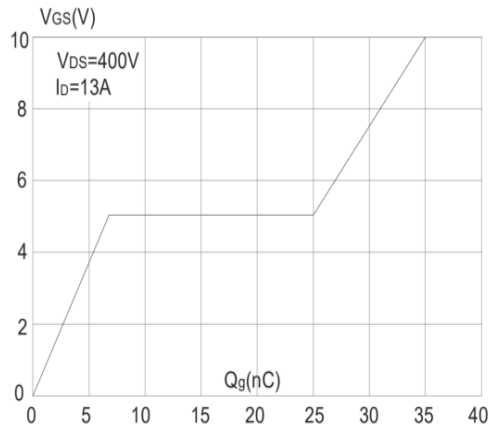


Figure 7: Gate Charge Characteristics

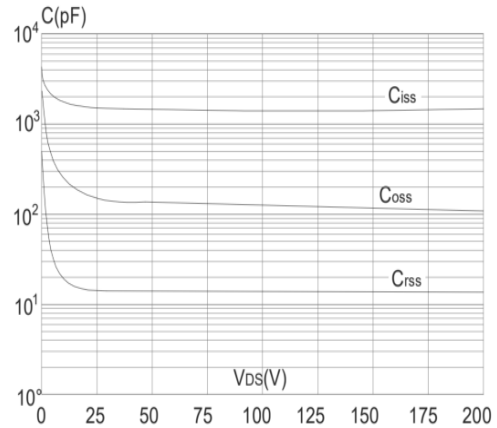


Figure 8: Capacitance Characteristics

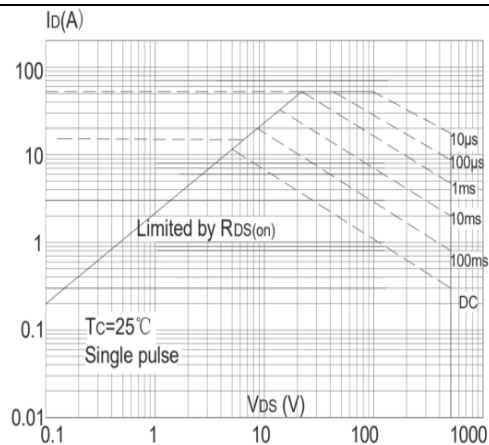


Figure 9: Maximum Safe Operating Area

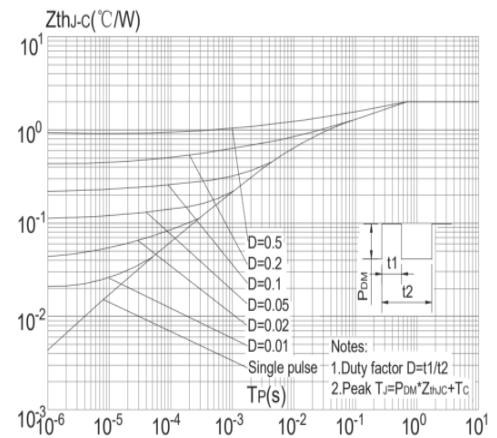
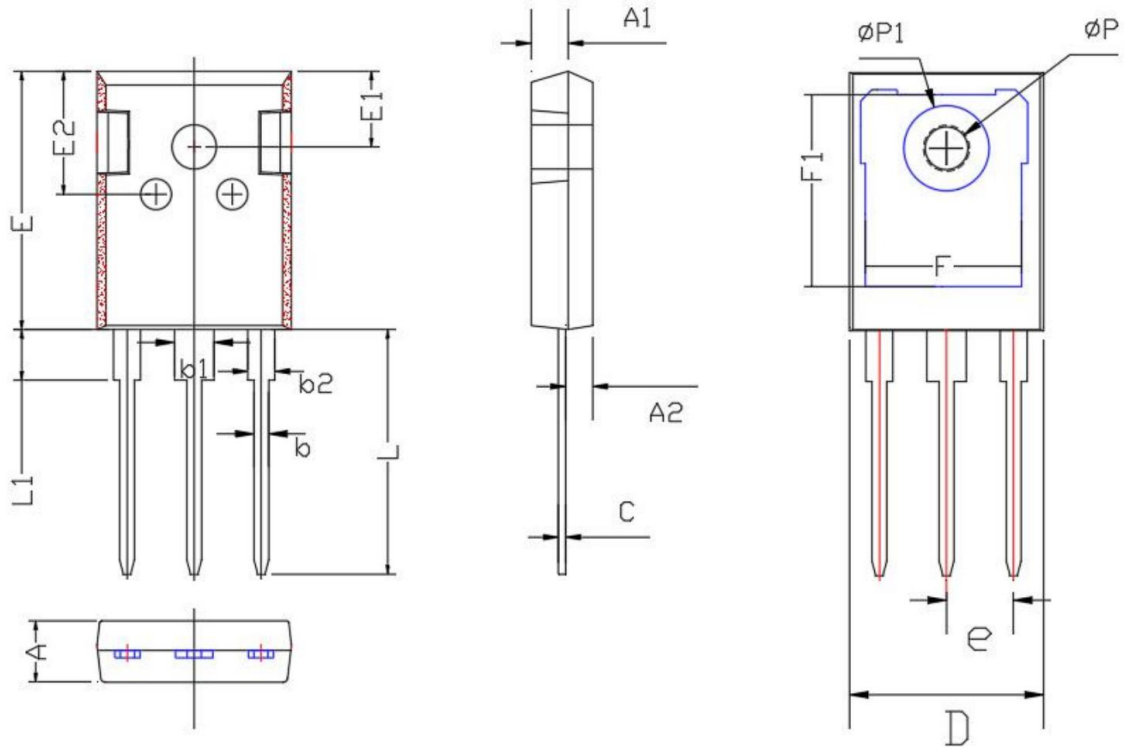


Figure 10: Normalized Maximum Transient Thermal Impedance

## ➤ Package Information

T0247



Symbol	MILL IMETER			Symbol	MILL IMETER		
	Min	Nom	Max		Min	Nom	Max
A	4.80	5.00	5.20	E1	5.60	5.80	6.20
A1	3.30	3.50	3.70	E2	9.8	10.0	10.2
A2	2.20	2.40	2.60	e	5.25	5.45	5.65
b	1.00	1.20	1.40	F	13.1	13.4	13.7
b1	2.90	3.10	3.30	F1	16.25	16.55	16.85
b2	1.90	2.10	2.30	L	19.5	20.0	20.5
c	0.50	0.60	0.71	L1	4.00	4.20	4.40
D	15.2	15.7	16.2	P	3.30	3.50	3.80
E	20.8	21	21.2	P1	6.80	7.10	7.40



---

## DISCLAIMER

SSCSEMI RESERVES THE RIGHT TO MAKE CHANGES WITHOUT FURTHER NOTICE TO ANY PRODUCTS HEREIN TO IMPROVE RELIABILITY, FUNCTION OR DESIGN. SSCSEMI DOES NOT ASSUME ANY LIABILITY ARISING OUT OF THE APPLICATION OR USE OF ANY PRODUCT OR CIRCUIT DESCRIBED HEREIN; NEITHER DOES IT CONVEY ANY LICENCE UNDER ITS PATENT RIGHTS, NOR THE RIGHTS OF OTHERS.

THE GRAPHS PROVIDED IN THIS DOCUMENT ARE STATISTICAL SUMMARIES BASED ON A LIMITED NUMBER OF SAMPLES AND ARE PROVIDED FOR INFORMATIONAL PURPOSE ONLY. THE PERFORMANCE CHARACTERISTICS LISTED IN THEM ARE NOT TESTED OR GUARANTEED. IN SOME GRAPHS, THE DATA PRESENTED MAY BE OUTSIDE THE SPECIFIED OPERATING RANGE (E.G. OUTSIDE SPECIFIED POWER SUPPLY RANGE) AND THEREFORE OUTSIDE THE WARRANTED RANGE.

OUR PRODUCT SPECIFICATIONS ARE ONLY VALID IF OBTAINED THROUGH THE COMPANY'S OFFICIAL WEBSITE, CRM SYSTEM, OR OUR SALES PERSONNEL CHANNELS. IF CHANGES OR SPECIAL VERSIONS ARE INVOLVED, THEY MUST BE STAMPED WITH A QUALITY SEAL AND MARKED WITH A SPECIAL VERSION NUMBER TO BE VALID.