



## SSCU9N60GN6

### N-Channel Enhancement Mode Power MOSFET

#### ➤ Features

##### N-Channel

$V_{DS}$	$V_{GS}$	$R_{DS(ON)}$ Typ.	$I_D$
60V	$\pm 20V$	8.9m $\Omega$ @10V	50A
		10.9m $\Omega$ @4V5	

#### ➤ Description

The SSCU9N60GN6 uses advanced trench technology to provide excellent  $R_{DS(ON)}$  and low gate charge. The complementary MOSFETs may be used to form a level shifted high side switch, and for a host of other applications.

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

#### ➤ Applications

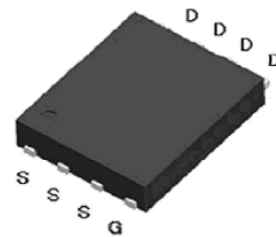
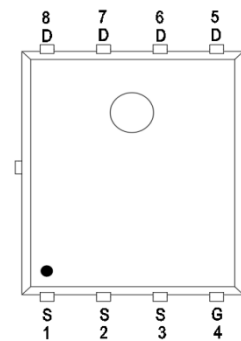
- PWM Applications
- Load Switch
- DC-DC Converters
- Wireless Chargers

#### ➤ Ordering Information

Device	Package	Shipping
SSCU9N60GN6	PDFN5X6	5000/Reel

#### ➤ Pin configuration

##### Top view



PDFN5X6



Marking

(XXYY: Internal Traceability Code)

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

Symbol	Parameter		Ratings	Unit
$V_{DS}$	Drain-to-Source Voltage		60	V
$V_{GS}$	Gate-to-Source Voltage		$\pm 20$	V
$I_D$	Continuous Drain Current <sup>d</sup>	$T_C=25^{\circ}\text{C}$	50	A
		$T_C=100^{\circ}\text{C}$	31	
$I_{DSM}$	Continuous Drain Current <sup>a</sup>	$T_A=25^{\circ}\text{C}$	18	A
		$T_A=70^{\circ}\text{C}$	12.8	
$I_{DM}$	Pulsed Drain Current <sup>b</sup>		200	A
$P_D$	Power Dissipation <sup>c</sup>	$T_C=25^{\circ}\text{C}$	57	W
		$T_C=100^{\circ}\text{C}$	20	
$P_{DSM}$	Power Dissipation <sup>a</sup>	$T_A=25^{\circ}\text{C}$	4.5	W
		$T_A=70^{\circ}\text{C}$	2.9	
$I_{AS}$	Avalanche Current <sup>b</sup> $L=0.5\text{mH}$ Single Pulse		26	A
$E_{AS}$	Avalanche Energy <sup>b</sup> $L=0.5\text{mH}$ Single Pulse		169	mJ
$T_J$	Operation junction temperature		-55~150	$^{\circ}\text{C}$
$T_{STG}$	Storage temperature range		-55~150	

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

Symbol	Parameter	Ratings	Max.	Unit
$R_{\theta JA}$	Junction-to-Ambient Thermal Resistance <sup>a</sup>	28	36	$^{\circ}\text{C/W}$
$R_{\theta JC}$	Junction-to-Case Thermal Resistance	2.5	3.3	

Note:

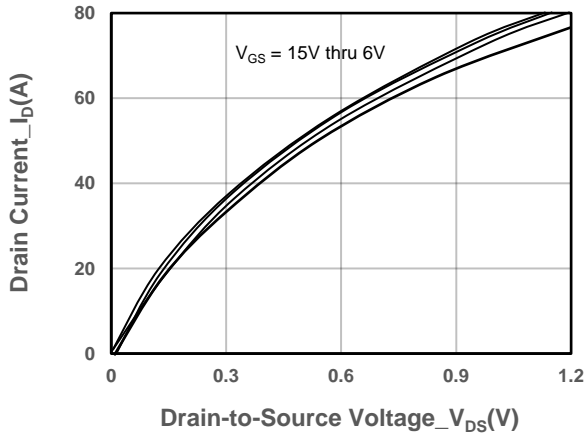
- The value of  $R_{\theta JA}$  is measured with the device mounted on 1 in<sup>2</sup> FR-4 board with 2oz.copper, in a still air environment with  $T_A=25^{\circ}\text{C}$ . The value in any given application depends on the user's specific board design. The current rating is based on the  $t \leq 10\text{s}$  thermal resistance rating.
- Repetitive rating, pulse width limited by junction temperature.
- The power dissipation  $P_D$  is based on  $T_{J(MAX)}=150^{\circ}\text{C}$ , using junction-to-case thermal resistance, and is more useful in setting the upper dissipation limit for cases where additional heat sinking is used.
- The maximum current rating is package limited.

**➤ N-Channel Electrical Characteristics (T<sub>A</sub>=25°C unless otherwise noted)**

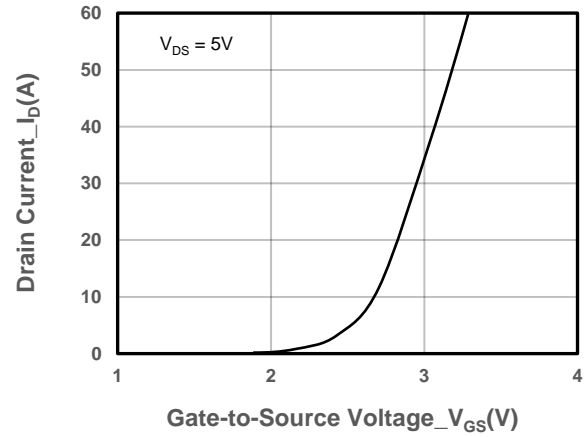
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Drain-Source Breakdown Voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> = 0V, I <sub>D</sub> = 250uA	60			V
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250uA	1.0	-	2.5	V
Drain-Source On-Resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> = 10V, I <sub>D</sub> = 20A		8.9	10.8	mΩ
Drain-Source On-Resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 15A		10.9	14.5	mΩ
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> = 60V, V <sub>GS</sub> = 0V			1	uA
Gate-Source Leak Current	I <sub>GSS</sub>	V <sub>GS</sub> = ±20V, V <sub>DS</sub> = 0V			±100	nA
Forward Voltage	V <sub>SD</sub>	V <sub>GS</sub> = 0V, I <sub>S</sub> = 10A			0.99	V
Gate Resistance	R <sub>G</sub>	V <sub>DS</sub> = 0V, f = 1MHz		1.4		Ω
Input Capacitance	C <sub>ISS</sub>	V <sub>DS</sub> = 30V, V <sub>GS</sub> = 0V, f = 1MHz		2411		pF
Output Capacitance	C <sub>OSS</sub>			124		
Reverse Transfer Capacitance	C <sub>RSS</sub>			116		
Total Gate Charge	Q <sub>G</sub>	V <sub>GS</sub> = 10V, V <sub>DS</sub> = 30V, I <sub>D</sub> = 20A		13.9		nC
Gate to Source Charge	Q <sub>GS</sub>			1.6		
Gate to Drain Charge	Q <sub>GD</sub>			3.1		
Turn-on Delay Time	T <sub>D(ON)</sub>	V <sub>GS</sub> = 10V, V <sub>DS</sub> = 30V, R <sub>L</sub> = 1.5Ω, R <sub>G</sub> = 6Ω		4.3		ns
Rise Time	T <sub>r</sub>			16		
Turn-off Delay Time	T <sub>D(OFF)</sub>			6.5		
Fall Time	T <sub>f</sub>			24		
Diode Recovery Time	T <sub>rr</sub>	I <sub>F</sub> =20A, di/dt=100A/us		24		ns
Diode Recovery Charge	Q <sub>rr</sub>	I <sub>F</sub> =20A, di/dt=100A/us		9.3		nC



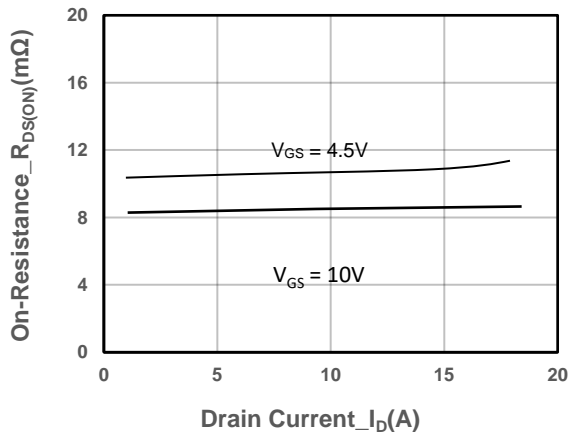
## ➤ N-Channel Typical Performance Characteristics ( $T_A=25^\circ\text{C}$ unless otherwise noted)



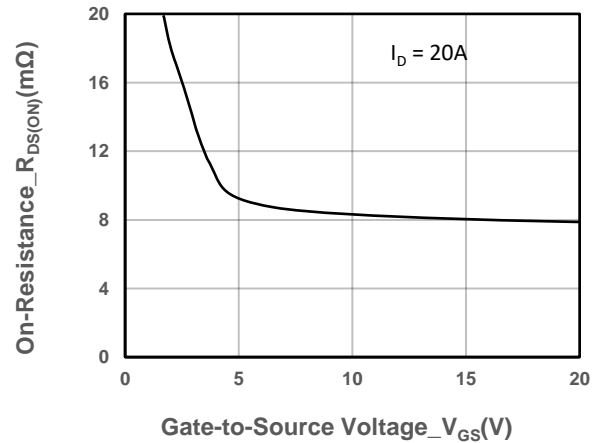
Output Characteristics



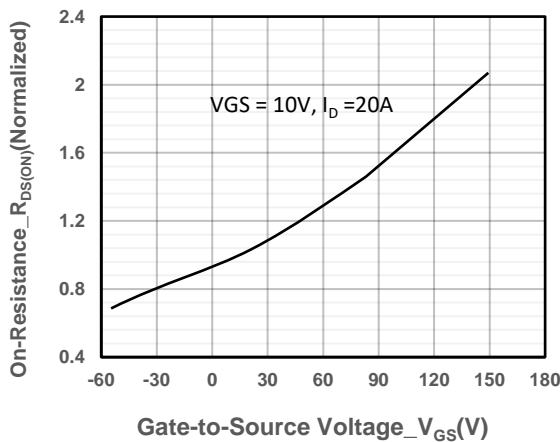
Transfer Characteristics



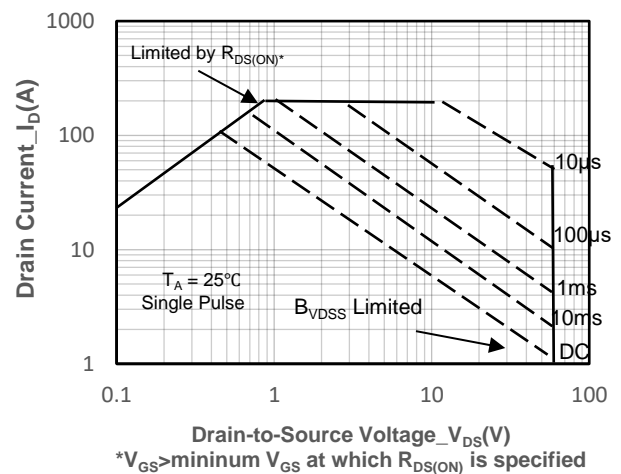
On-Resistance vs. Drain Current and Gate Voltage



On-Resistance vs. Gate-to-Source Voltage

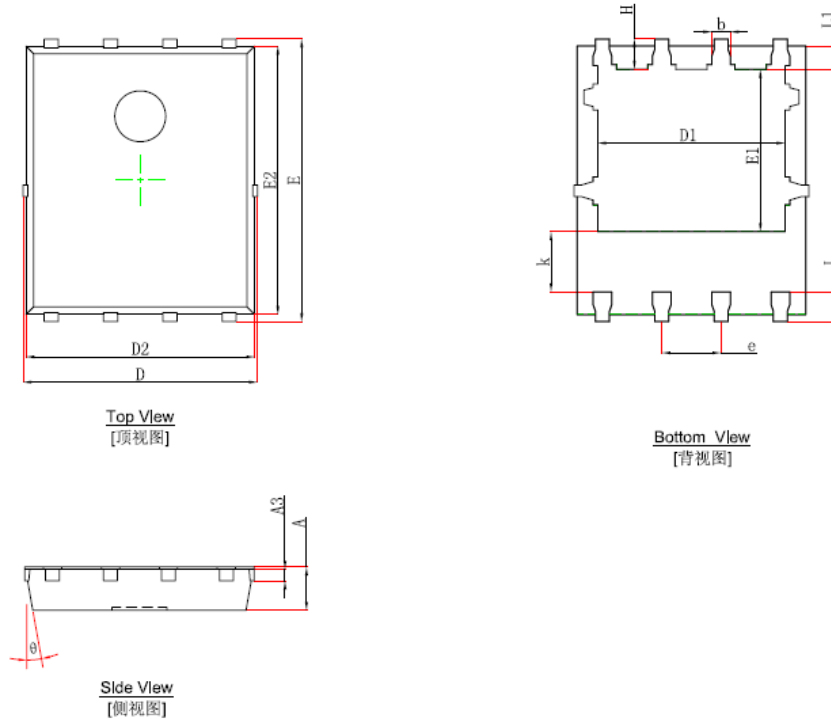


On-Resistance vs. Junction Temperature



Safe Operating Area vs. Junction-to-Ambient

## ➤ Package Information



Package: PDNF5X6-8L

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.000	0.035	0.039
A3	0.254REF		0.010REF	
D	4.944	5.096	0.195	0.201
E	5.974	6.126	0.235	0.241
D1	3.910	4.110	0.154	0.162
E1	3.375	3.575	0.133	0.141
D2	4.824	4.976	0.190	0.196
E2	5.674	5.826	0.223	0.229
k	1.190	1.390	0.047	0.055
b	0.350	0.450	0.014	0.018
e	1.270TYP		0.050TYP	
L	0.559	0.711	0.022	0.028
L1	0.424	0.576	0.017	0.023
H	0.574	0.726	0.023	0.029
θ	10°	12°	10°	12°



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