



SSCU4230NP20GN4

N and P-Channel Enhancement Mode Power MOSFET

➤ Features

N-Channel

V_{DS}	V_{GS}	$R_{DS(ON)}$ Typ.	I_D
20V	$\pm 12V$	9.3m Ω @4.5V	42A
		11m Ω @2.5V	

P-Channel

V_{DS}	V_{GS}	$R_{DS(ON)}$ Typ.	I_D
-20V	$\pm 12V$	17.5m Ω @-4.5V	-30A
		22m Ω @-2.5V	

➤ Description

The SSCU4230NP20GN4 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 + ΔV_{DS} + R_g Tested!

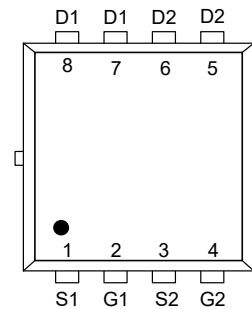
➤ Applications

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

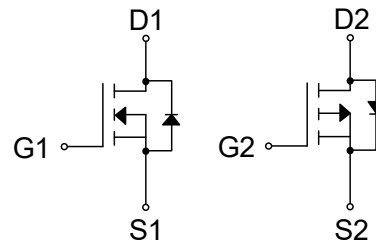
➤ Ordering Information

Device	Package	Shipping
SSCU4230NP20GN4	PDFN3.3X3.3-8L	5000/Reel

➤ Pin configuration



PDFN3.3X3.3-8L (Top View)



Pin Configuration



Marking

(XXYY: Internal Traceability Code)

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

Parameter		Symbol	N-Channel	P-Channel	Unit
Drain-to-Source Voltage		V_{DSS}	20	-20	V
Gate-to-Source Voltage		V_{GSS}	± 12	± 12	V
Continuous Drain Current ^a	$T_A=25^{\circ}\text{C}$	I_{D}	42	-30	A
	$T_A=100^{\circ}\text{C}$		21	-15	A
Pulsed Drain Current ^b		I_{DM}	168	-120	A
Power Dissipation ^a		P_{DSM}	2.6	2.6	W
Avalanche Energy ^b L=0.5mH Single Pulse		I_{AS}	15	-14	A
Avalanche Energy ^b L=0.5mH Single Pulse		E_{AS}	56	49	mJ
Power Dissipation ^c	$T_A=25^{\circ}\text{C}$	P_{D}	20	20	W
	$T_A=100^{\circ}\text{C}$		8	7.9	W
Operation junction temperature		T_{J}	-55 to 150	-55 to 150	$^{\circ}\text{C}$
Storage temperature range		T_{STG}	-55 to 150	-55 to 150	$^{\circ}\text{C}$

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

Symbol	Parameter	N-Channel	P-Channel	Unit
$R_{\theta\text{JA}}$	Junction-to-Ambient Thermal Resistance ^a	48	48	$^{\circ}\text{C/W}$
$R_{\theta\text{JC}}$	Junction-to-Case Thermal Resistance	6.3	6.25	

Note:

- The value of $R_{\theta\text{JA}}$ is measured with the device mounted on 1 in² 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 $T_{\text{J(MAX)}}=150^{\circ}\text{C}$, using junction-to-case thermal resistance, and is more useful in setting the upper dissipation limit for cases where additional heat sinking is used.



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➤ N-Channel Electrical Characteristics (T_A=25°C unless otherwise noted)

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Drain-Source Breakdown Voltage	V _{(BR)DSS}	V _{GS} = 0V, I _D = 250μA	20			V
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250uA	0.4		1.2	V
Drain-Source On-Resistance	R _{DS(on)}	V _{GS} = 4.5V, I _D = 15A		9.3	13	mΩ
		V _{GS} = 2.5V, I _D = 10A		11	16	
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 20V, V _{GS} = 0V			1	μA
Gate-Source Leak Current	I _{GSS}	V _{GS} = ±12V, V _{DS} = 0V			±100	nA
Forward Voltage	V _{SD}	V _{GS} = 0V, I _S = 15A			1.3	V
Gate Resistance	R _G	V _{DS} = 0V, f = 1MHz		1.3		Ω
Input Capacitance	C _{ISS}	V _{DS} = 10V, V _{GS} = 0V, f = 1MHz		1080		pF
Output Capacitance	C _{OSS}			130		
Reverse Transfer Capacitance	C _{RSS}			115		
Total Gate Charge	Q _G	V _{GS} = 4.5V, V _{DS} = 10V, I _D = 15A		14		nC
Gate to Source Charge	Q _{GS}			2.1		
Gate to Drain Charge	Q _{GD}			3.3		
Turn-on Delay Time	T _{D(ON)}	V _{GS} = 4.5V, V _{DS} = 10V, R _L = 1Ω, R _G = 3Ω		13		ns
Rise Time	T _r			9		
Turn-off Delay Time	T _{D(OFF)}			48		
Fall Time	T _f			8.6		



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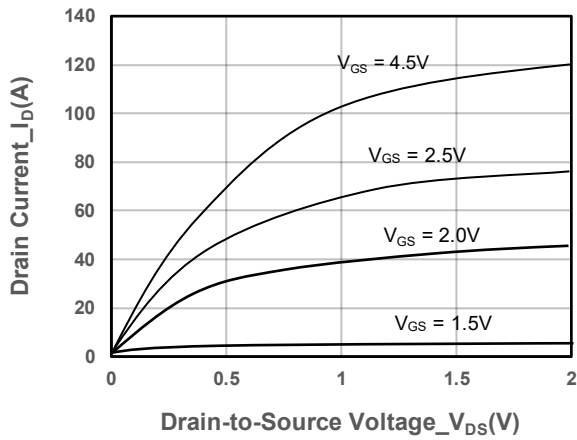
➤ P-Channel Electrical Characteristics (T_A=25°C unless otherwise noted)

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = -250\mu A$	-20			V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250\mu A$	-0.5		-1.2	V
Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS} = -4.5V, I_D = -10A$		17.5	23	mΩ
		$V_{GS} = -2.5V, I_D = -5A$		22	30	
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = -20V, V_{GS} = 0V$			-1	μA
Gate-Source Leak Current	I_{GSS}	$V_{GS} = \pm 12V, V_{DS} = 0V$			±100	nA
Forward Voltage	V_{SD}	$V_{GS} = 0V, I_S = -1A$		-0.7	-1.3	V
Gate Resistance	R_G	$V_{DS} = 0V, f = 1MHz$		5.6		Ω
Input Capacitance	C_{ISS}	$V_{DS} = -10V, V_{GS} = 0V,$ $f = 1MHz$		1278		pF
Output Capacitance	C_{OSS}			175		
Reverse Transfer Capacitance	C_{RSS}			158		
Total Gate Charge	Q_G	$V_{GS} = -4.5V, V_{DS} = -10V,$ $I_D = -3A$		13.5		nC
Gate to Source Charge	Q_{GS}			1.3		
Gate to Drain Charge	Q_{GD}			5		
Turn-on Delay Time	$T_{D(ON)}$	$V_{GS} = -4.5V, V_{DS} = -10V,$ $R_L = 1\Omega, R_G = 3\Omega$		12		ns
Rise Time	T_r			35		
Turn-off Delay Time	$T_{D(OFF)}$			26		
Fall Time	T_f			8		

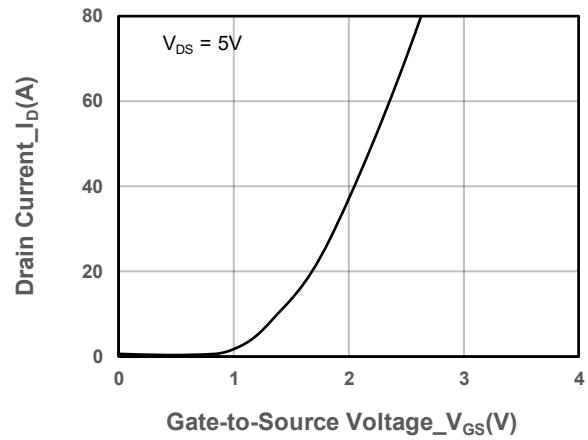


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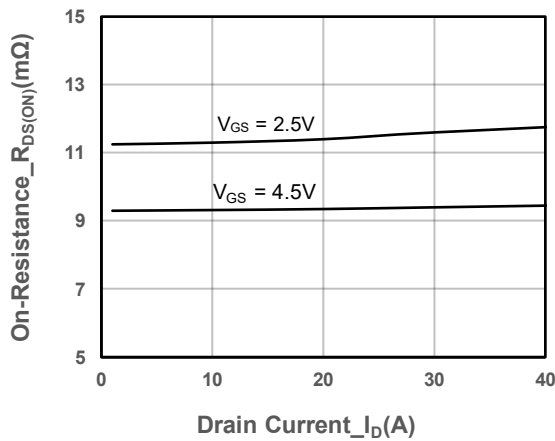
➤ N-Channel Typical Performance Characteristics ($T_A=25^\circ\text{C}$ unless otherwise noted)



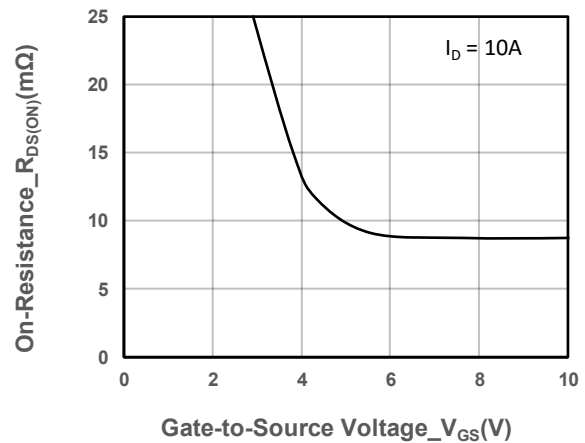
Output Characteristics



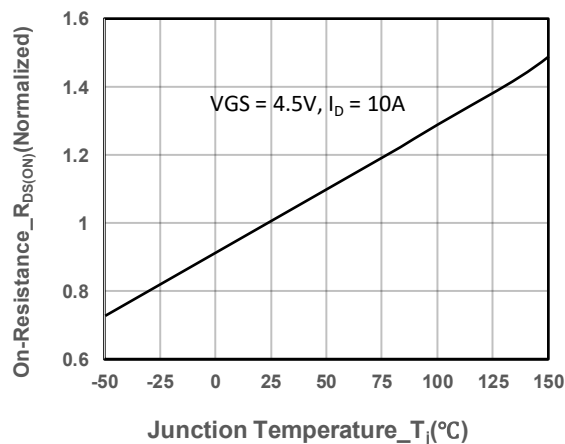
Transfer Characteristics



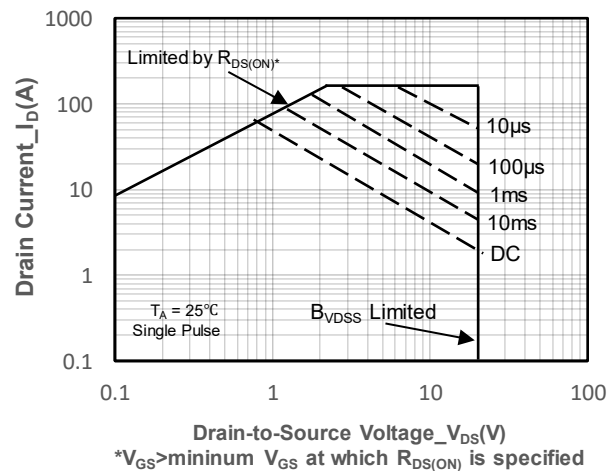
On-Resistance vs. Drain Current and Gate Voltage



On-Resistance vs. Gate-to-Source Voltage



On-Resistance vs. Junction Temperature

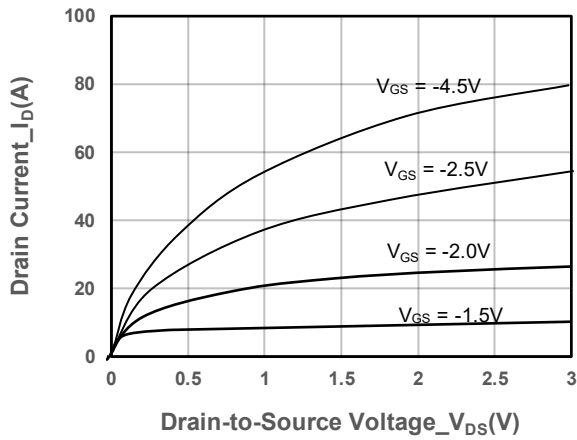


Safe Operating Area vs. Junction-to-Ambient

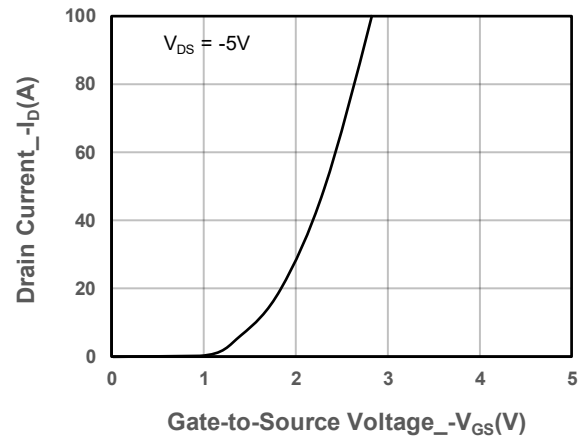


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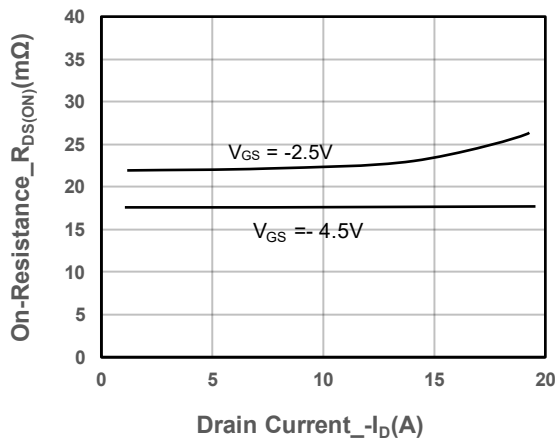
➤ P-Channel Typical Performance Characteristics ($T_A=25^\circ\text{C}$ unless otherwise noted)



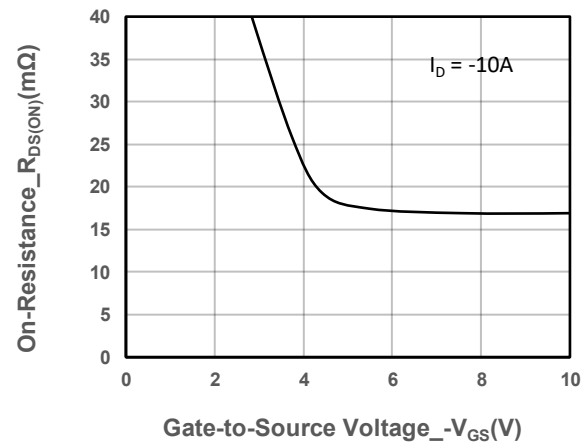
Output Characteristics



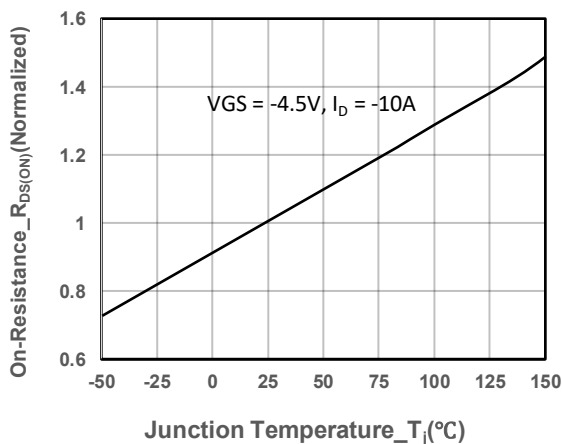
Transfer Characteristics



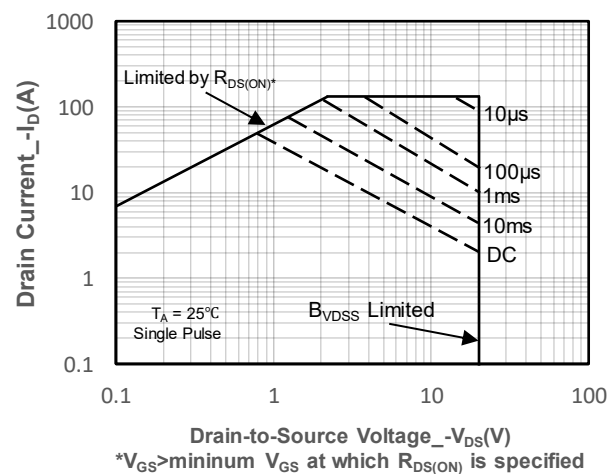
On-Resistance vs. Drain Current and Gate Voltage



On-Resistance vs. Gate-to-Source Voltage

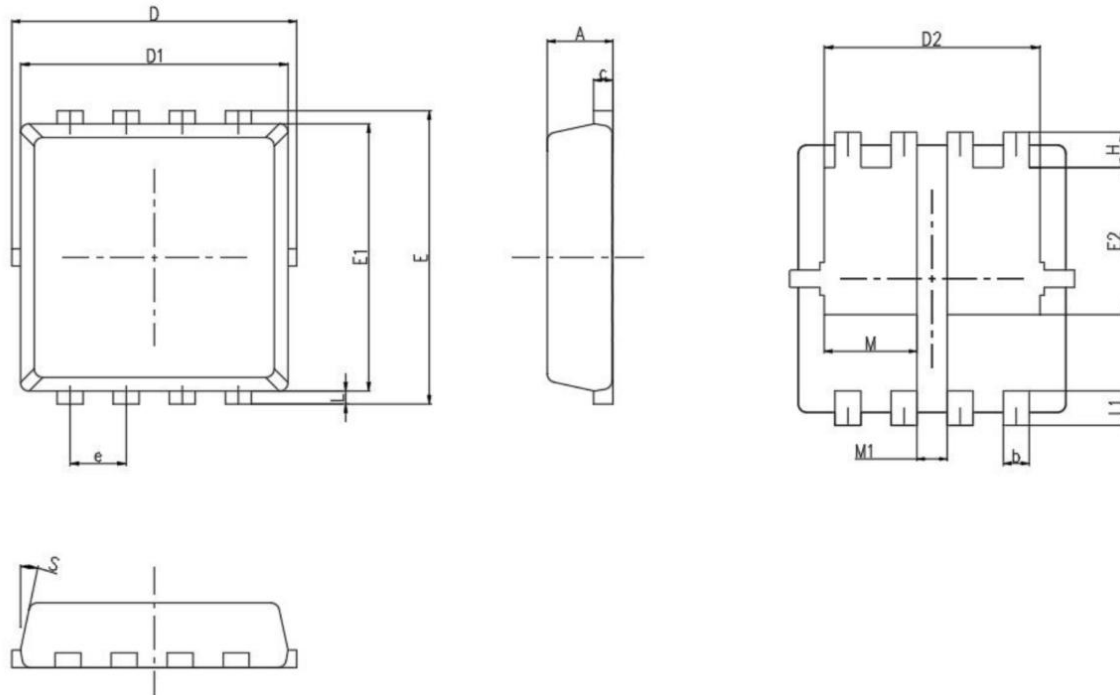


On-Resistance vs. Junction Temperature



Safe Operating Area vs. Junction-to-Ambient

➤ Package Information



Symbol	MILL IMETER		
	Min	Nom	Max
A	0.60	0.75	0.90
b	0.25	0.30	0.35
c	0.10	0.20	0.30
D	3.00	3.20	3.45
D1	3.05	3.15	3.25
D2	2.40	2.50	2.60
E	3.10	3.30	3.50
E1	2.90	3.05	3.20
E2	1.55	1.75	1.95
e	0.65BSC		
H	0.20	0.40	0.57
L	0.06	0.10	0.20
L1	0.30	0.40	0.55
S	10°	12°	14°
M	0.95	1.05	1.15
M1	0.4BSC		



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