



SSCU0906NP40GSB

N and P-Channel Enhancement Mode Power MOSFET

➤ Features

N-Channel

V_{DS}	V_{GS}	$R_{DS(ON)}$ Typ.	I_D
40V	$\pm 20V$	30m Ω @10V	9A
		38m Ω @4.5V	

P-Channel

V_{DS}	V_{GS}	$R_{DS(ON)}$ Typ.	I_D
-40V	$\pm 20V$	69m Ω @-10V	-6A
		85m Ω @-4.5V	

➤ Description

The SSCU0906NP40GSB 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.

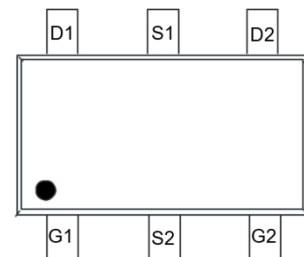
➤ Applications

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

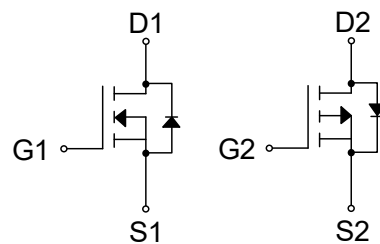
➤ Ordering Information

Device	Package	Shipping
SSCU0906NP40GSB	SOT-23-6L	3000/Reel

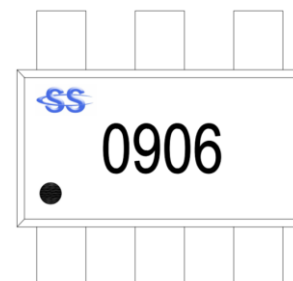
➤ Pin configuration



SOT-23-6L (Top View)



Pin Configuration



Marking

**➤ 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}	40	-40	V
Gate-to-Source Voltage		V_{GSS}	± 20	± 20	V
Continuous Drain Current ^a	$T_A=25^{\circ}\text{C}$	I_{D}	9	-6	A
	$T_A=100^{\circ}\text{C}$		4	-3	A
Pulsed Drain Current ^b		I_{DM}	30	-20	A
Power Dissipation ^a		P_{DSM}	1.2	1.2	W
Power Dissipation ^c	$T_A=25^{\circ}\text{C}$	P_{D}	2.5	2.5	W
	$T_A=100^{\circ}\text{C}$		1	1	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	105	105	$^{\circ}\text{C}/\text{W}$
$R_{\theta\text{JC}}$	Junction-to-Case Thermal Resistance	50	50	

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.



SSCU0906NP40GSB

➤ 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 = 250uA	40			V
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250uA	1	1.8	2.5	V
Drain-Source On-Resistance	R _{DS(on)}	V _{GS} = 10V, I _D = 4A		30	45	mΩ
		V _{GS} = 4.5V, I _D = 3A		38	60	
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 40V, V _{GS} = 0V			1	μA
Gate-Source Leak Current	I _{GSS}	V _{GS} = ±20V, V _{DS} = 0V			±100	nA
Forward Voltage	V _{SD}	V _{GS} = 0V, I _S = 1A		0.7	1.3	V
Input Capacitance	C _{ISS}	V _{DS} = 20V, V _{GS} = 0V, f = 1MHz		538		pF
Output Capacitance	C _{OSS}			42		
Reverse Transfer Capacitance	C _{RSS}			33		
Total Gate Charge	Q _G	V _{GS} = 10V, V _{DS} = 20V, I _D = 3A		6.2		nC
Gate to Source Charge	Q _{GS}			3.2		
Gate to Drain Charge	Q _{GD}			2		
Turn-on Delay Time	T _{D(ON)}	V _{GS} = 10V, V _{DS} = 20V, R _L = 1Ω, R _G = 3Ω		8		ns
Rise Time	T _r			22		
Turn-off Delay Time	T _{D(OFF)}			15		
Fall Time	T _f			8		



SSCU0906NP40GSB

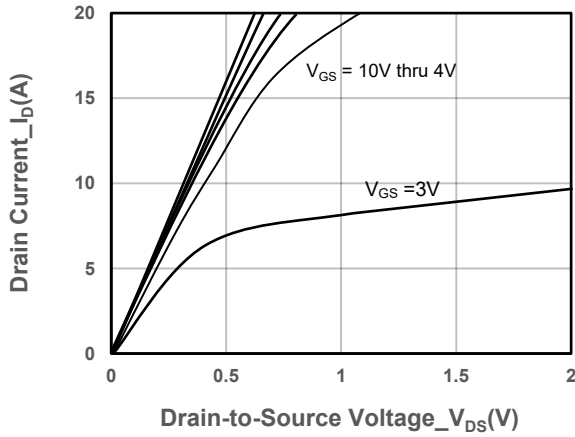
➤ P-Channel Electrical Characteristics (T_A=25°C unless otherwise noted)

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Drain-Source Breakdown Voltage	V _{(BR)DSS}	V _{GS} = 0V, I _D = -250uA	-40			V
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = -250uA	-1	-1.6	-2.5	V
Drain-Source On-Resistance	R _{DS(on)}	V _{GS} = -10V, I _D = -3A		69	90	mΩ
		V _{GS} = -4.5V, I _D = -2A		85	110	
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = -40V, V _{GS} = 0V			-1	μA
Gate-Source Leak Current	I _{GSS}	V _{GS} = ±20V, V _{DS} = 0V			±100	nA
Forward Voltage	V _{SD}	V _{GS} = 0V, I _S = -1A		-0.7	-1.3	V
Input Capacitance	C _{ISS}	V _{DS} = -20V, V _{GS} = 0V, f = 1MHz		672		pF
Output Capacitance	C _{OSS}			45		
Reverse Transfer Capacitance	C _{RSS}			42		
Total Gate Charge	Q _G	V _{GS} = -10V, V _{DS} = -20V, I _D = -2A		13		nC
Gate to Source Charge	Q _{GS}			2.5		
Gate to Drain Charge	Q _{GD}			2		
Turn-on Delay Time	T _{D(ON)}	V _{GS} = -10V, V _{DS} = -20V, R _L = 1Ω, R _G = 3Ω,		10		ns
Rise Time	T _r			20		
Turn-off Delay Time	T _{D(OFF)}			21		
Fall Time	T _f			12.5		

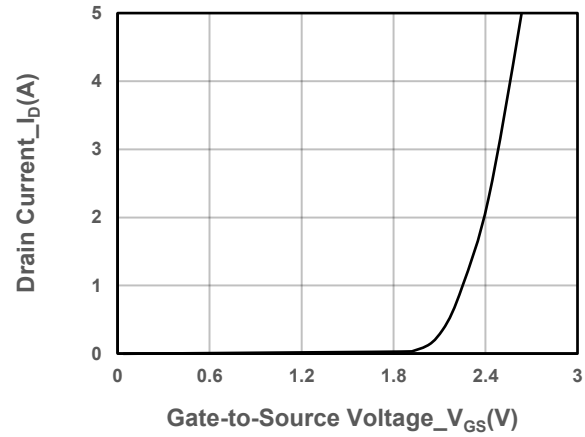


SSCU0906NP40GSB

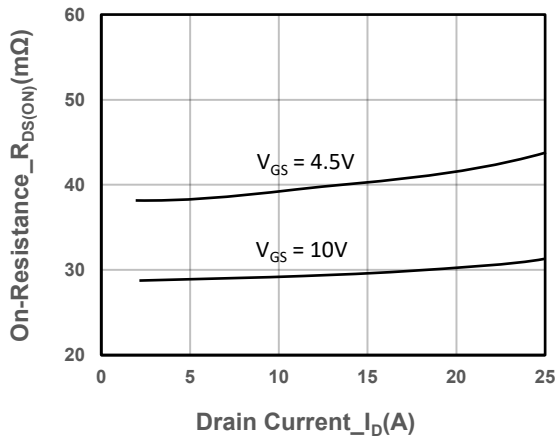
➤ N-Channel Typical Performance Characteristics ($T_A=25^\circ\text{C}$ unless otherwise noted)



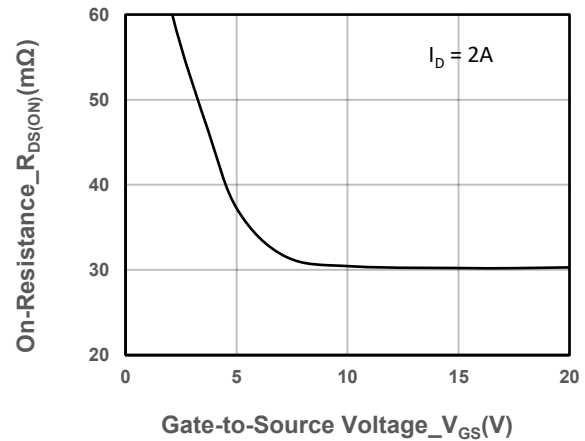
Output Characteristics



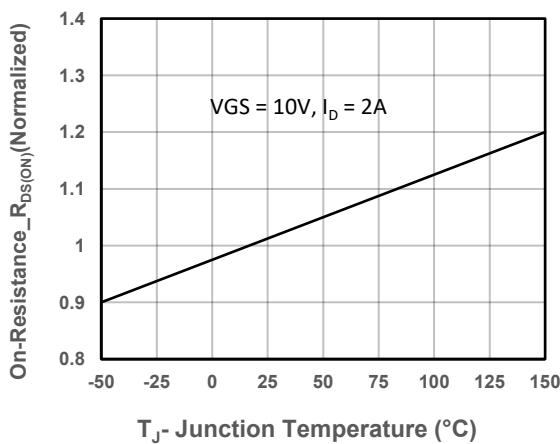
Transfer Characteristics



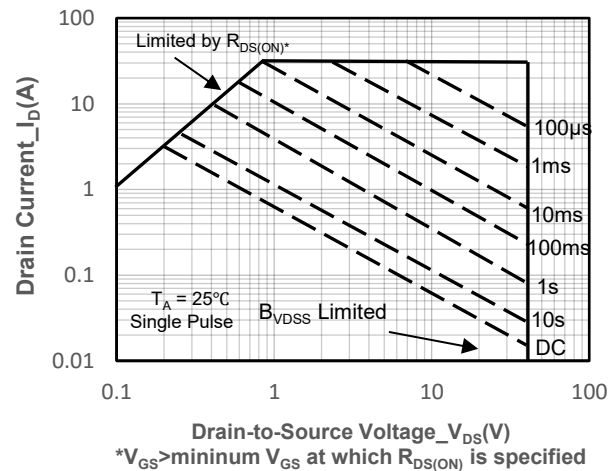
On-Resistance vs. Drain Current and Gate Voltage



On-Resistance vs. Gate-to-Source Voltage



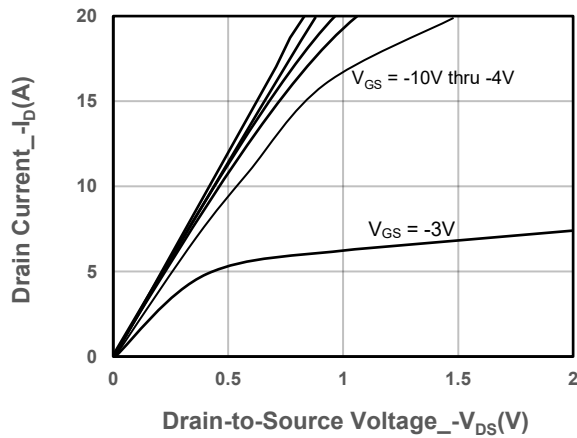
On-Resistance vs. Junction Temperature



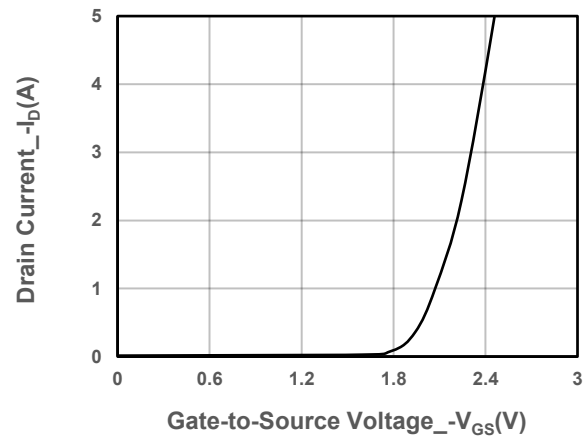
Safe Operating Area vs. Junction-to-Ambient



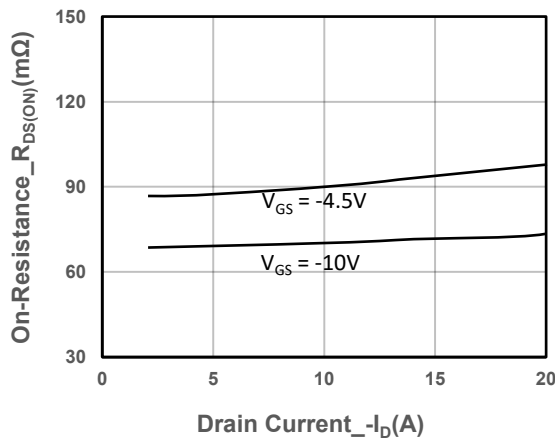
➤ P-Channel Typical Performance Characteristics ($T_A=25^\circ\text{C}$ unless otherwise noted)



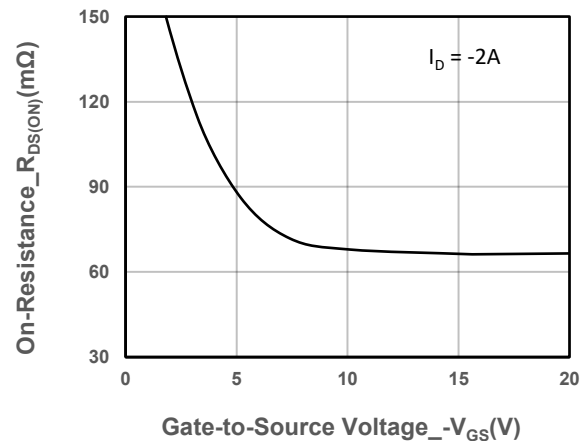
Output Characteristics



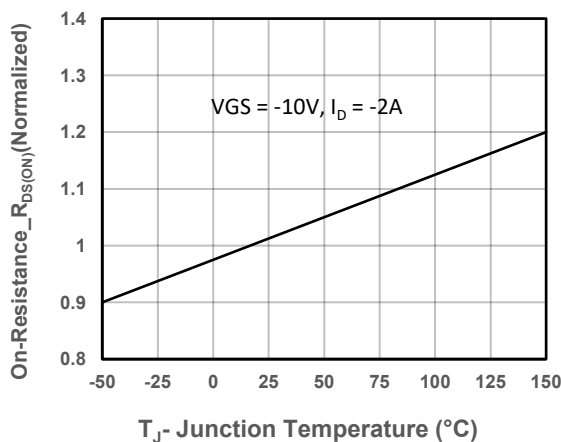
Transfer Characteristics



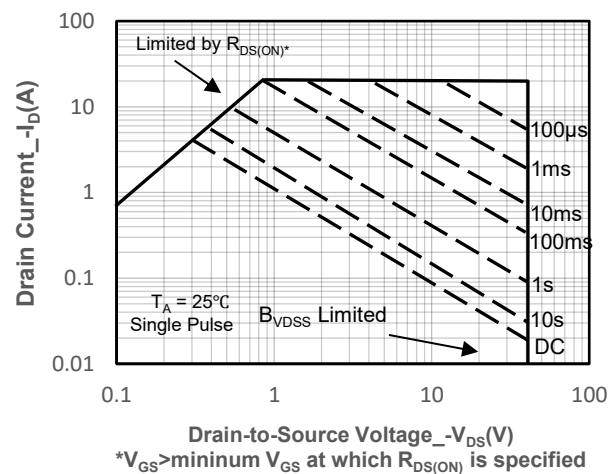
On-Resistance vs. Drain Current and Gate Voltg



On-Resistance vs. Gate-to-Source Voltage



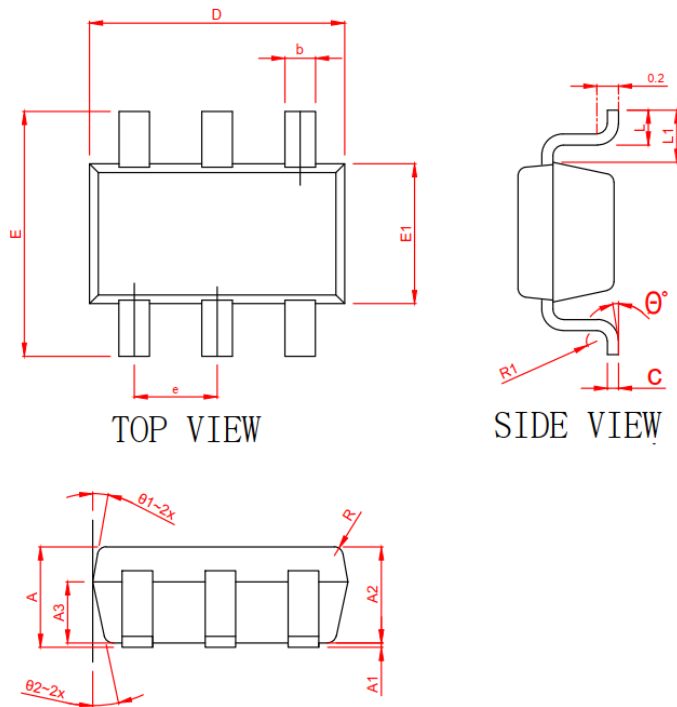
On-Resistance vs. Junction Temperature



Safe Operating Area vs. Junction-to-Ambient



➤ Package Information



SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	1.06	1.15	1.24
* A1	0.01	0.05	0.09
* A2	1.05	1.10	1.15
A3	0.65	0.70	0.75
* b	0.30	0.35	0.45
* c	0.127REF		
* D	2.87	2.92	2.97
* E	2.72	2.80	2.88
* E1	1.55	1.60	1.65
* e	0.95BSC		
* L	0.32	0.40	0.48
* L1	0.55	0.60	0.65
R	0.10 REF		
R1	0.12 REF		
* θ	0	--	8°
θ1	8°	10°	12°
θ2	10°	12°	14°

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.