SSCU0504NP40GSA

N and P-Channel Enhancement Mode Power MOSFET

➢ Features

N-Channel

V_{DS}	V_{GS}	$R_{DS(ON)}$ Typ.	I_D
40V	±20V	32mΩ@10V	5A
		40mΩ@4.5V	

P-Channel

V_{DS}	V_{GS}	$R_{DS(ON)}$ Typ.	I_D
-40V	±20V	60mΩ@-10V	-4A
		75mΩ@-4.5V	

➢ Description

The SSCU0504NP40GSA uses advanced trench technology to provide excellent RDS(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.

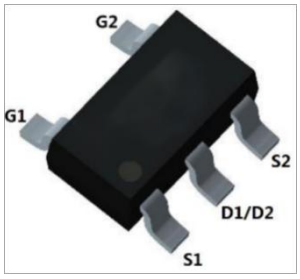
➢ Applications

- Power supply
- Switching circuits
- DC-DC Converters

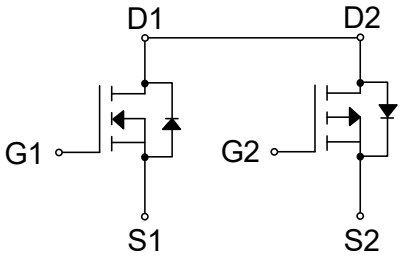
➢ Ordering Information

Device	Package	Shipping
SSCU0504NP40GSA	SOT23-5L	3000/Reel

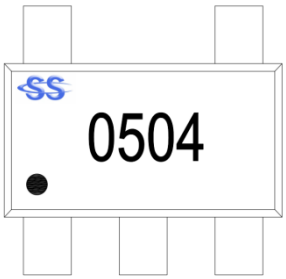
➢ Pin configuration



SOT23-5L (Top View)



Pin Configuration



Marking

➢ Absolute Maximum Ratings (T_A=25℃ 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℃	I_D	5	-4	A
	T_A = 100℃		2.6	-2	A
Pulsed Drain Current [b]		I_{DM}	20	-16	A
Power Dissipation [a]		I_{DSM}	5	-3.7	A
Power Dissipation [c]	T_A = 25℃	P_D	1.6	1.6	W
	T_A = 100℃		0.6	0.6	W
Operation junction temperature		T_J	-55 to 150	-55 to 150	℃
Storage temperature range		T_{STG}	-55 to 150	-55 to 150	℃

➢ Thermal Resistance Ratings (T_A=25℃ unless otherwise noted)

Symbol	Parameter	N-Channel	P-Channel	Unit
$R_{\theta JA}$	Junction-to-Case Thermal Resistance	80	80	℃/W

Note:

a. The value of $R_{\theta JA}$ is measured with the device mounted on 1 in^2 FR-4 board with 2oz.copper,in a still air environment with T_A=25℃.The value in any given application depends on the user is specific board design. The current rating is based on the t≤10s thermal resistance rating.

b. Repetitive rating, pulse width limited by junction temperature.

c. The power dissipation P_D is based on $T_{J(MAX)}$=150°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.

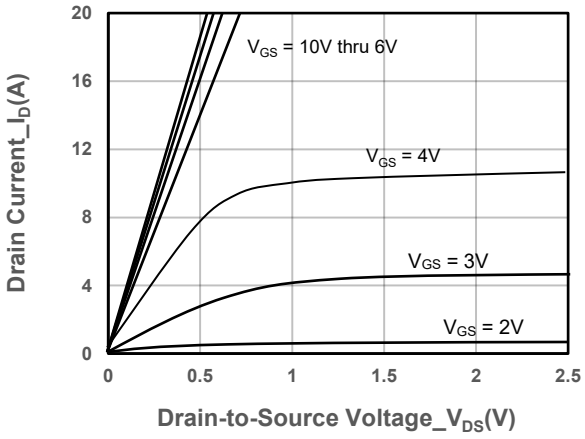
➢ N-Channel Electrical Characteristics (T_A=25℃ unless otherwise noted)

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		32	52	mΩ
		V_{GS} = 4.5V, I_D = 3A		40	65	
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		0.8	1.3	V
Input Capacitance	C_{ISS}	V_{DS} = 20V, V_{GS} = 0V, f = 1MHz		450		pF
Output Capacitance	C_{OSS}			39		
Reverse Transfer Capacitance	C_{RSS}			34		
Total Gate Charge	Q_G	V_{GS} = 10V, V_{DS} = 20V, I_D = 2A		8		nC
Gate to Source Charge	Q_{GS}			1.2		
Gate to Drain Charge	Q_{GD}			2.2		
Turn-on Delay Time	$T_{D(ON)}$	V_{GS} = 10V, V_{DS} = 20V, I_D = 2A, R_G = 3Ω		10		ns
Rise Time	T_r			12		
Turn-off Delay Time	$T_{D(OFF)}$			16		
Fall Time	T_f			10		

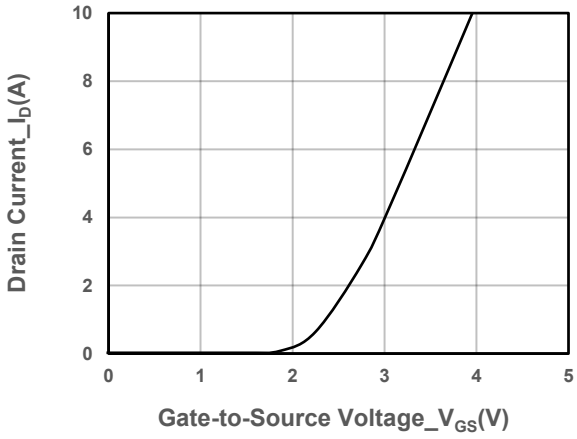
➢ P-Channel Electrical Characteristics (T_A=25℃ unless otherwise noted)

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D = -250μA	-40			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = -250uA	-1	-1.5	-2.5	V
Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS} = -10V, I_D = -3A		60	80	mΩ
		V_{GS} = -4.5V, I_D = -2A		75	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		-0.8	-1.3	V
Input Capacitance	C_{ISS}	V_{DS} = -20V, V_{GS} = 0V, f = 1MHz		478		pF
Output Capacitance	C_{OSS}			45		
Reverse Transfer Capacitance	C_{RSS}			36		
Total Gate Charge	Q_G	V_{GS} = -10V, V_{DS} = -20V, I_D = -3A		6.2		nC
Gate to Source Charge	Q_{GS}			1.5		
Gate to Drain Charge	Q_{GD}			1.5		
Turn-on Delay Time	$T_{D(ON)}$	V_{GS} = -10V, V_{DS} = -20V, I_D = -1A, R_G = 3Ω,		11		ns
Rise Time	T_r			5.6		
Turn-off Delay Time	$T_{D(OFF)}$			46		
Fall Time	T_f			9		

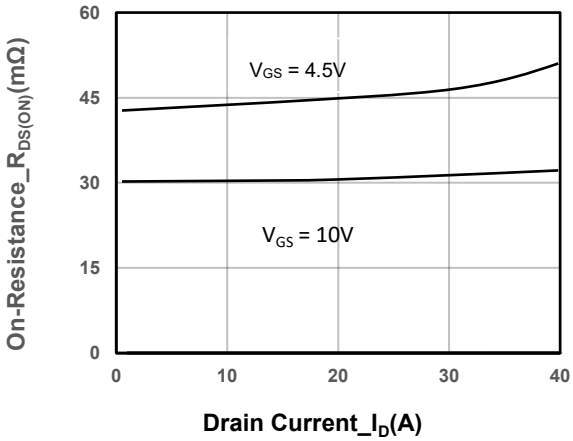
➢ N-Channel Typical Performance Characteristics (T_A=25℃ unless otherwise noted)



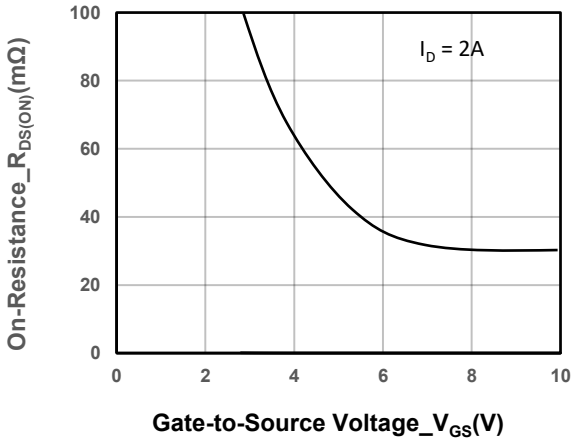
Output Characteristics



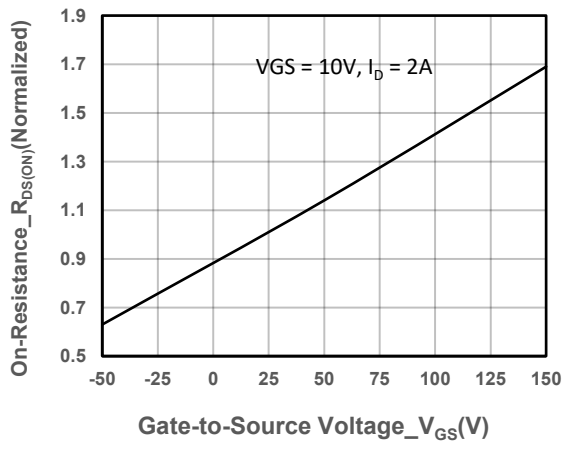
Transfer Characteristics



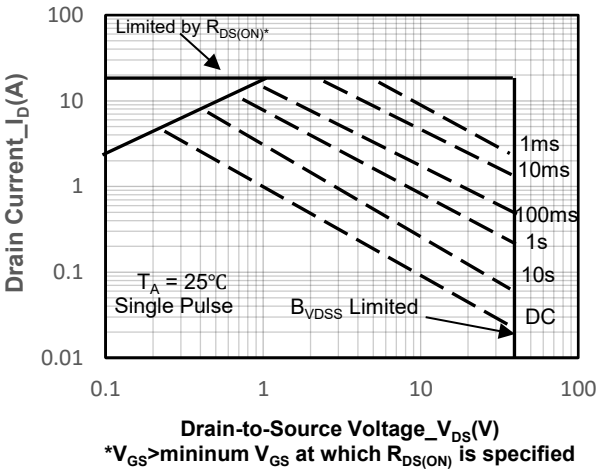
On-Resistance vs. Drain Current and Gate Voltage



On-Resistance vs. Gate-to-Source Voltage



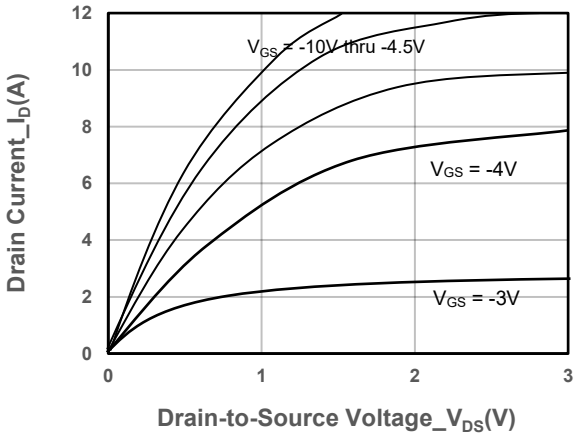
On-Resistance vs. Junction Temperature



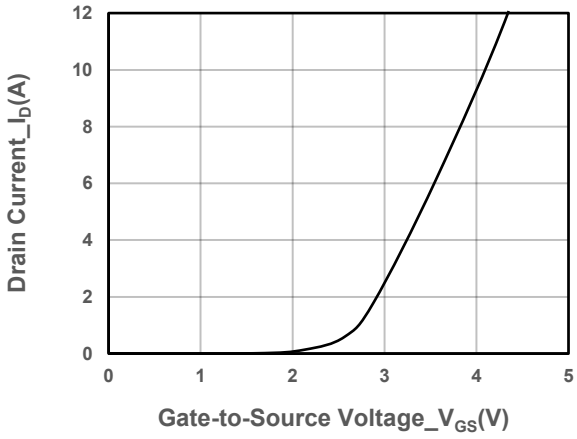
Drain-to-Source Voltage_V_{DS}(V)
***V_{GS}>mininum V_{GS} at which $R_{DS(ON)}$ is specified**

Safe Operating Area vs. Junction-to-Ambient

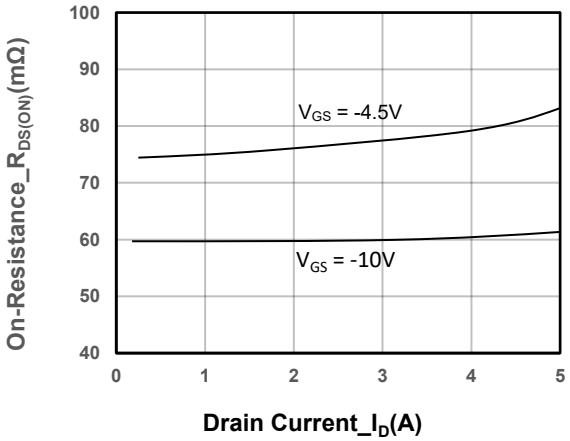
➢ P-Channel Typical Performance Characteristics (T_A=25℃ unless otherwise noted)



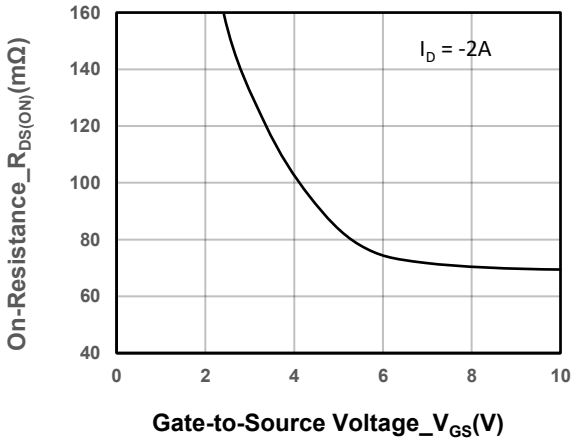
Output Characteristics



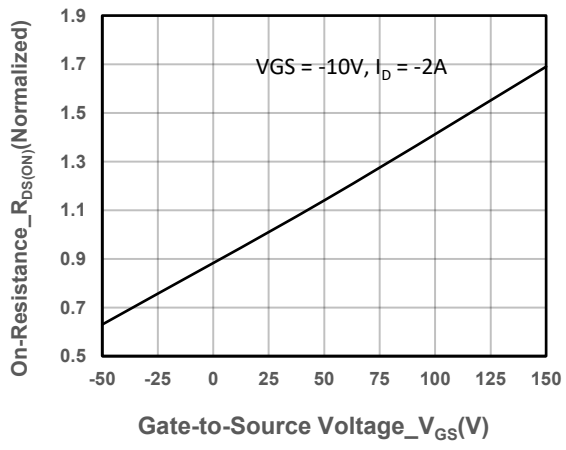
Transfer Characteristics



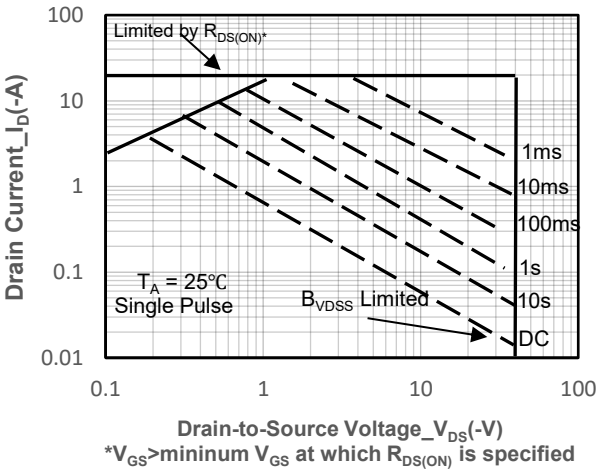
On-Resistance vs. Drain Current and Gate Voltage



On-Resistance vs. Gate-to-Source Voltage

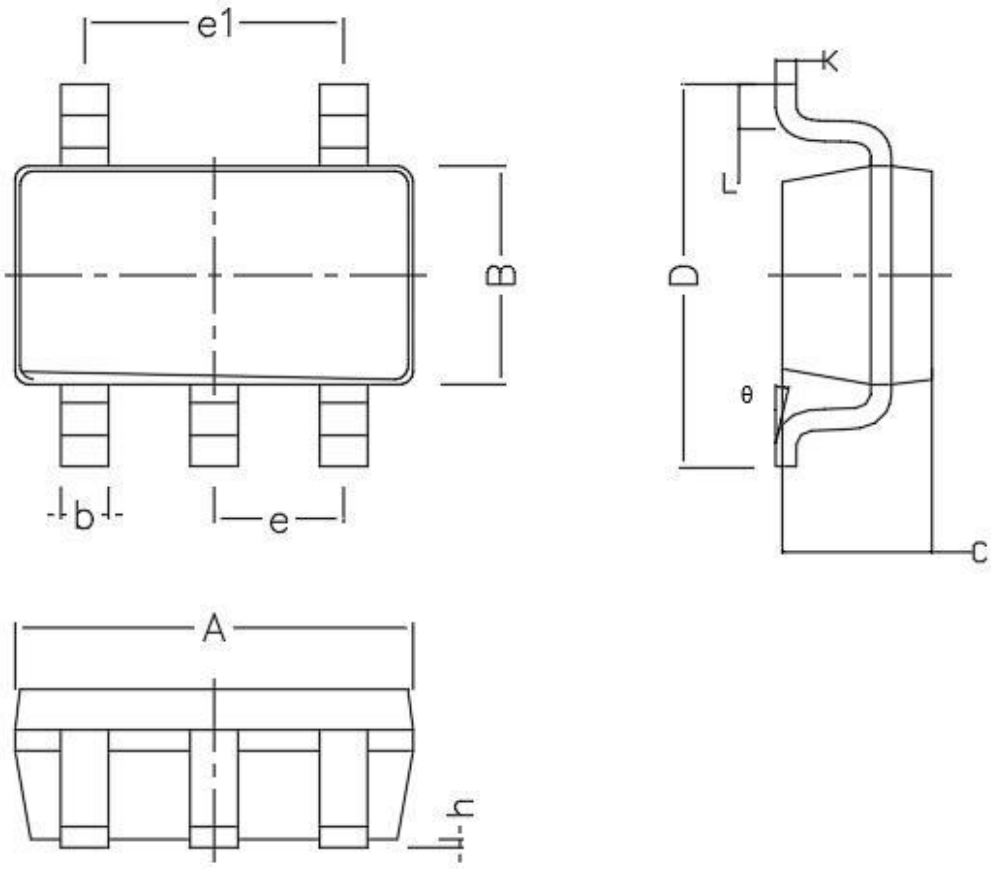


On-Resistance vs. Junction Temperature



Safe Operating Area vs. Junction-to-Ambient

➢ Package Information



Symbol	MILL IMETER		
	Min	Nom	Max
A	2.80	2.92	3.05
B	1.50	1.60	1.70
C	1.00	1.10	1.20
D	2.60	2.80	3.00
L	0.30	0.45	0.60
b	0.28	0.35	0.5
h	0.00	/	0.15
K	0.1	/	0.3
e	0.95BSC		
e1	1.90BSC		
θ	0°	/	10°

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