SSCL6N40GQ4

N-Channel Enhancement Mode MOSFET

➢ Features

V_{DS}	V_{GS}	$R_{DS(ON)}$ Typ.	I_D
40V	±20V	6 mΩ@10V	53A
		7 mΩ@4.5V	

➢ Description

This device is N-Channel enhancement MOSFET. Uses SGT technology and design to provide excellent RDSON with low gate charge. This device is suitable for use in DC-DC conversion, power switch and charging circuit.

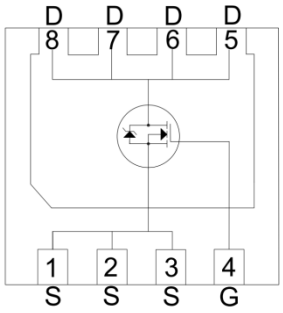
➢ Applications

- Motor Drive Control
- DC/DC Conversion
- Half and Full Bridge Topology
- Inverter

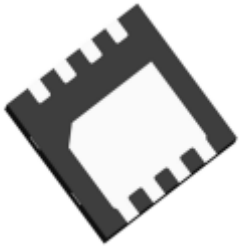
➢ Ordering Information

Device	Package	Shipping
SSCL6N40GQ4	DFN3X3	5000/Reel

➢ Pin Configuration



DFN3X3 (Top View)



Bottom View

Marking

(XXYY: Internal Traceability Code)

➢ Absolute Maximum Ratings (T_A=25℃ unless otherwise noted)

Symbol	Parameter		Ratings	Unit
V_{DSS}	Drain-to-Source Voltage		40	V
V_{GSS}	Gate-to-Source Voltage		±20	V
I_D	Continuous Drain Current [d]	T_C=25℃	53	A
		T_C=100℃	33	
I_{DSM}	Continuous Drain Current [a]	T_A=25℃	16	A
		T_A=70℃	13	
I_{DM}	Pulsed Drain Current [b]		212	A
P_D	Power Dissipation [c]	T_C=25℃	36	W
		T_C=100℃	14	
P_{DSM}	Power Dissipation [a]	T_A=25℃	3.2	W
		T_A=70℃	2.1	
I_{AS}	Avalanche Current [b] L=0.5mH Single Pulse		15	A
E_{AS}	Avalanche Energy [b] L=0.5mH Single Pulse		56	mJ
T_J	Operation junction temperature		-55~150	℃
T_{STG}	Storage temperature range		-55~150	

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

Symbol	Parameter	Ratings	Max.	Unit
$R_{\theta JA}$	Junction-to-Ambient Thermal Resistance [a]	39	50	℃/W
$R_{\theta JC}$	Junction-to-Case Thermal Resistance	3.5	4.5	

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 power dissipation is based on the t≤10s thermal resistance rating.

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

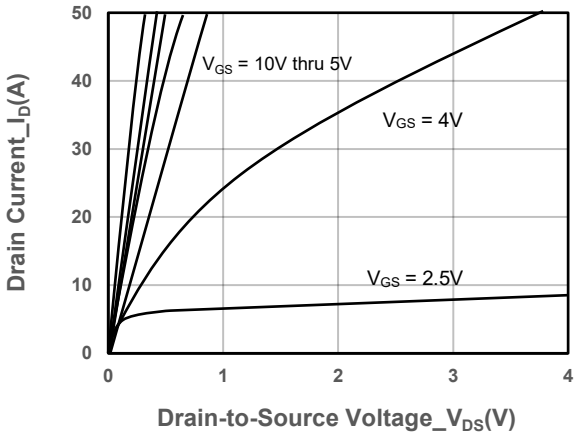
c. The power dissipation P_D is based on $T_{J(MAX)}$=150°C, using junction-to-case thermal resistance, and is more useful in setting the upper dissipation limit for cases where additional heat sinking is used.

d. The maximum current rating is package limited.

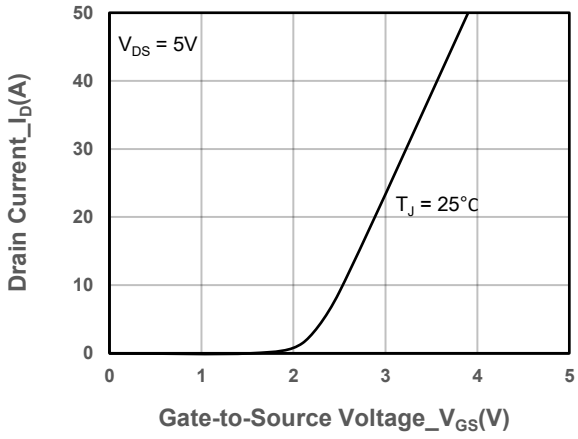
➢ Electrical Characteristics (T_A=25℃ unless otherwise noted)

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	1.6	2.5	V
Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS} = 10V, I_D = 15A		6	8	mΩ
		V_{GS} = 4.5V, I_D = 10A		7	10	
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 = 10A		0.75	1.3	V
Gate Resistance	R_G	V_{DS} = 0V, f = 1MHz		2.0		Ω
Input Capacitance	C_{ISS}	V_{DS} = 20V, V_{GS} = 0V, f = 1MHz		958		pF
Output Capacitance	C_{OSS}			610		
Reverse Transfer Capacitance	C_{RSS}			30		
Total Gate Charge	Q_G	V_{GS} = 10V, V_{DS} = 20V, I_D = 20A		20		nC
Gate to Source Charge	Q_{GS}			4.2		
Gate to Drain Charge	Q_{GD}			3.5		
Turn-on Delay Time	$T_{D(ON)}$	V_{GS} = 10V, V_{DS} = 20V, I_D = 20A, R_G = 3Ω		7		ns
Rise Time	T_r			3		
Turn-off Delay Time	$T_{D(OFF)}$			25		
Fall Time	T_f			5		
Diode Recovery Time	T_{rr}	I_F=20A, di/dt=100A/us		38		ns
Diode Recovery Charge	Q_{rr}	I_F=20A, di/dt=100A/us		24		nC

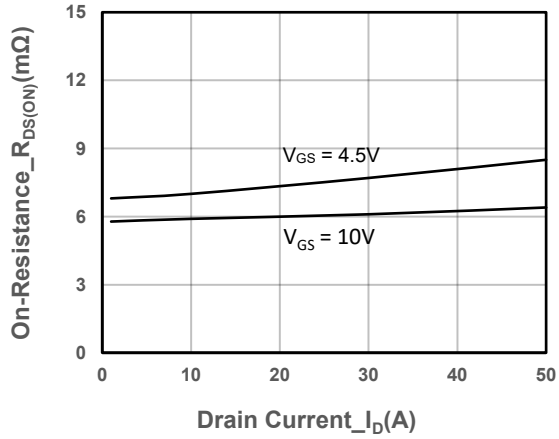
➢ Typical Performance Characteristics (T_A=25℃ unless otherwise noted)



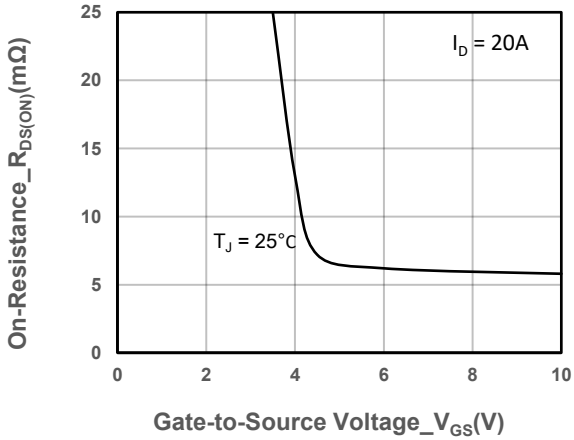
Output Characteristics



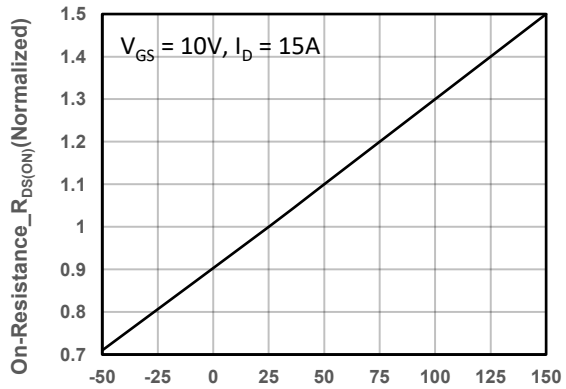
Transfer Characteristics



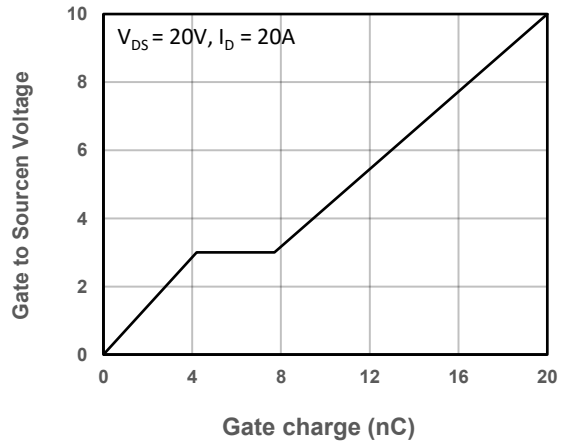
On-Resistance vs. Drain Current and Gate Voltag



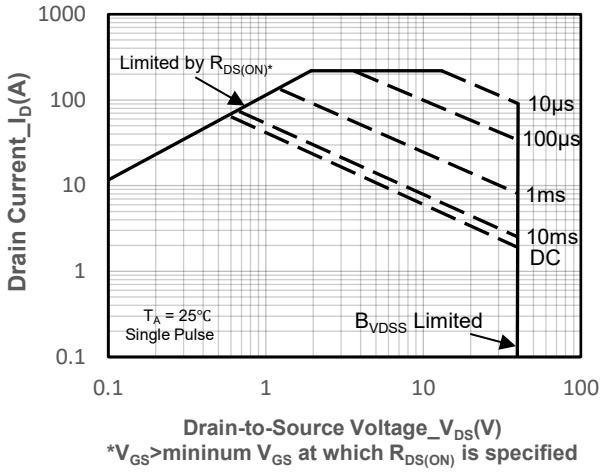
On-Resistance vs. Gate-to-Source Voltage



On-Resistance vs. Junction Temperature

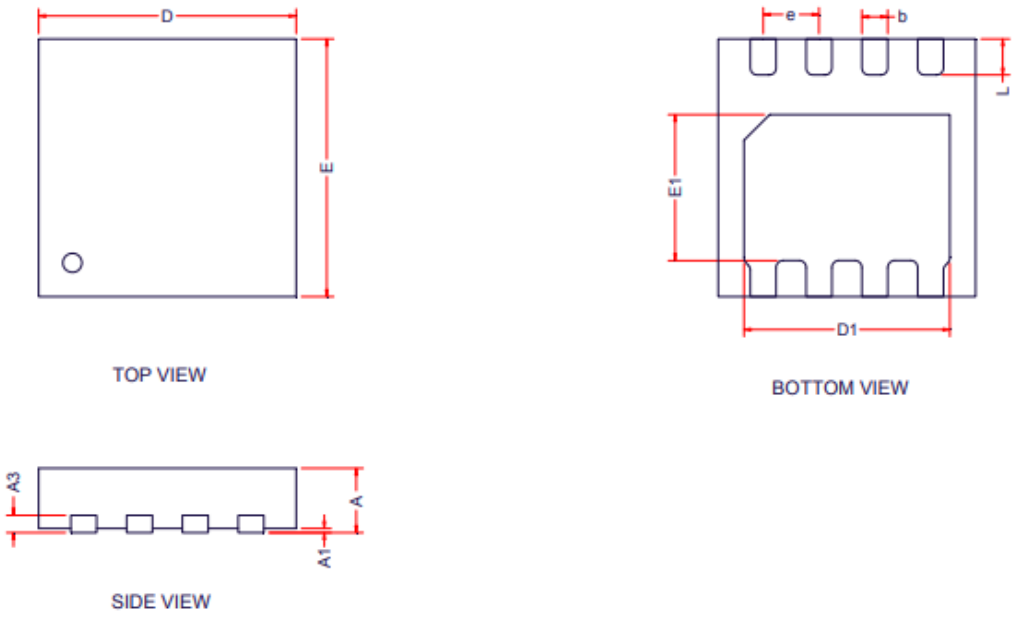


Gate-Source Voltage vs. Gate charge



Safe Operating Area vs. Junction-to-Ambient

➢ Package Information



DFN3X3

Symbol	Dimensions in Millimeters		
	Min.	Typ.	Max.
A	0.70	0.75	0.80
A1	0.00	0.02	0.05
A2		0.20Ref	
D	2.90	3.00	3.10
E	2.90	3.00	3.10
D1	2.35	2.40	2.45
E1	1.65	1.70	1.75
b	0.25	0.30	0.35
e		0.65BSC	
L	0.37	0.42	0.47

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