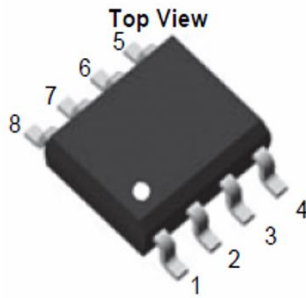
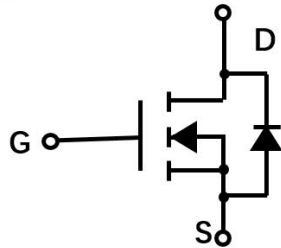
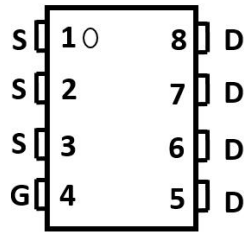


SCS10N04A

N-Channel Enhancement Mode Field Effect Transistor



SOP-8



Product Summary

- V_{DS} 40 V
- I_D 10 A
- $R_{DS(ON)}$ (at $V_{GS} = 10V$) $< 15m\Omega$
- $R_{DS(ON)}$ (at $V_{GS} = 4.5V$) $< 24m\Omega$

General Description

- Trench Power LV MOSFET technology
- Excellent package for heat dissipation
- High density cell design for low $R_{DS(ON)}$

Applications

- High current load applications
- Load switching
- Hard switched and high frequency circuits
- Uninterruptible power supply

■ Absolute Maximum Ratings ($T_A = 25^\circ C$ unless otherwise noted)

Parameter		Symbol	Limit	Unit
Drain-source Voltage		V_{DS}	40	V
Gate-source Voltage		V_{GS}	± 20	V
Drain Current	$T_A = 25^\circ C$	I_D	10	A
	$T_A = 100^\circ C$		7.0	
Pulsed Drain Current ^A		I_{DM}	50	A
Single Pulse Avalanche Energy ^B		E_{AS}	70	mJ
Total Power Dissipation	$T_A = 25^\circ C$	P_D	3.0	W
	$T_A = 100^\circ C$		1.2	
Thermal Resistance Junction-to-Lead ^C		$R_{\theta JL}$	30	$^\circ C/W$
		$R_{\theta JA}$	41.5	
Junction and Storage Temperature Range		T_J, T_{STG}	$-55 \sim +150$	$^\circ C$

■ Ordering Information (Example)

PREFERRED P/N	PACKING CODE	Marking	MINIMUM PACKAGE(pcs)	INNER BOX QUANTITY(pcs)	OUTER CARTON QUANTITY(pcs)	DELIVERY MODE
SCS10N04A	F2	Q10N04	4000	8000	64000	13" reel

SCS10N04A

■ Electrical Characteristics (T_J=25℃ unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Static Parameter						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} = 0V, I _D =250μA	40			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =40V,V _{GS} =0V			1	μA
Gate-Body Leakage Current	I _{GSS}	V _{GS} = ±20V, V _{DS} =0V			±100	nA
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D =250μA	1.0	1.5	2.5	V
Static Drain-Source On-Resistance	R _{DS(ON)}	V _{GS} = 10V, I _D =8.0A		12.5	15	mΩ
		V _{GS} = 4.5V, I _D =4.0A		15.5	24	
Diode Forward Voltage	V _{SD}	I _S =10A,V _{GS} =0V		0.85	1.2	V
Maximum Body-Diode Continuous Current	I _S				10	A
Dynamic Parameters						
Input Capacitance	C _{iss}	V _{DS} =20V,V _{GS} =0V,f=1MHZ		917		pF
Output Capacitance	C _{oss}			128		
Reverse Transfer Capacitance	C _{rss}			108		
Switching Parameters						
Total Gate Charge	Q _g	V _{GS} =10V,V _{DS} =20V,I _D =20A		23.6		nC
Gate-Source Charge	Q _{gs}			4.4		
Gate-Drain Charge	Q _{gd}			6.3		
Reverse Recovery Charge	Q _{rr}	I _F =20A, di/dt=100A/us		0.4		ns
Reverse Recovery Time	t _{rr}			7		
Turn-on Delay Time	t _{D(on)}	V _{GS} =10V,V _{DD} =20V, I _D =2A,R _L =1Ω R _{GEN} =3Ω		10		
Turn-on Rise Time	t _r			56		
Turn-off Delay Time	t _{D(off)}			27		
Turn-off fall Time	t _f			72		

A. Pulse Test: Pulse Width≤300us, Duty cycle ≤2%.

B. R_{θJA} is the sum of the junction-to-lead and lead-to-ambient thermal resistance, where the case thermal reference is defined as the solder mounting surface of the drain pins. R_{θJL} is guaranteed by design, while R_{θJA} is determined by the board design. The maximum rating presented here is based on mounting on a 1 in 2 pad of 2oz copper.

■ Typical Performance Characteristics

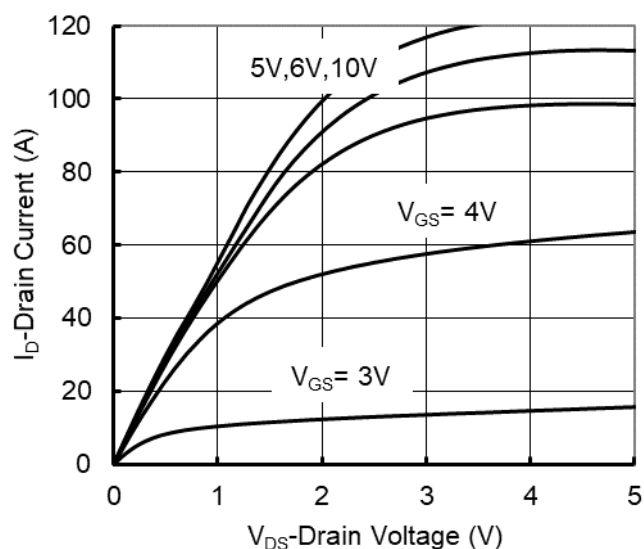


Figure 1. Output Characteristics

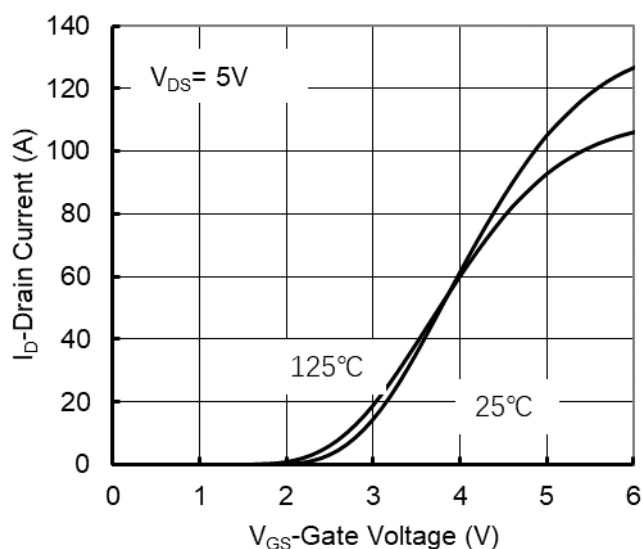


Figure 2. Transfer Characteristics

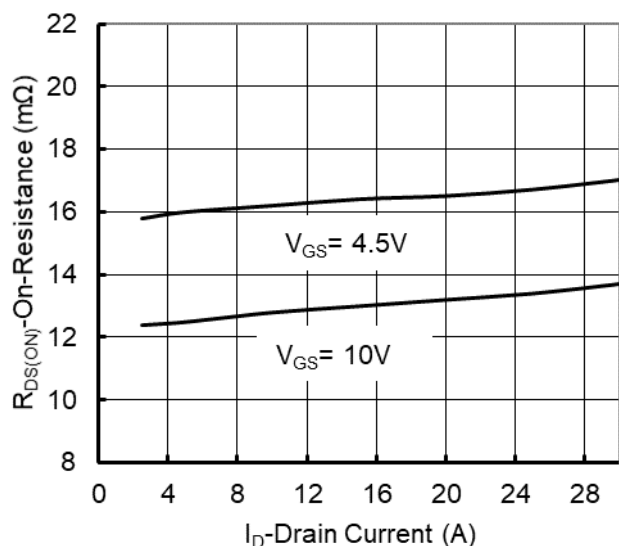


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

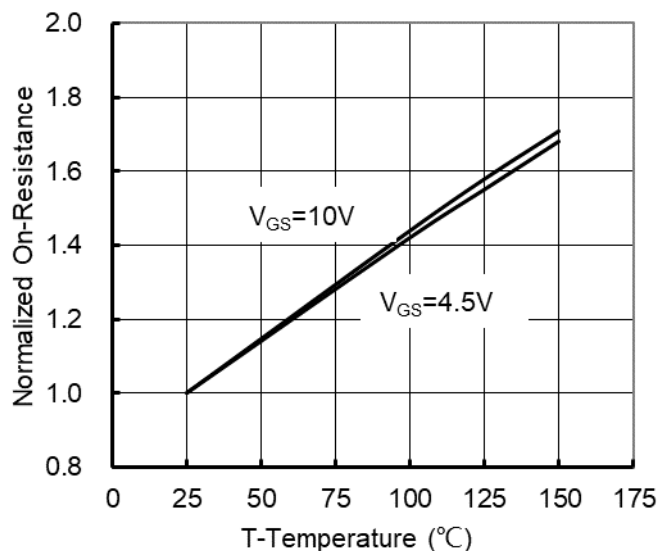


Figure 4. On-Resistance vs. Junction Temperature

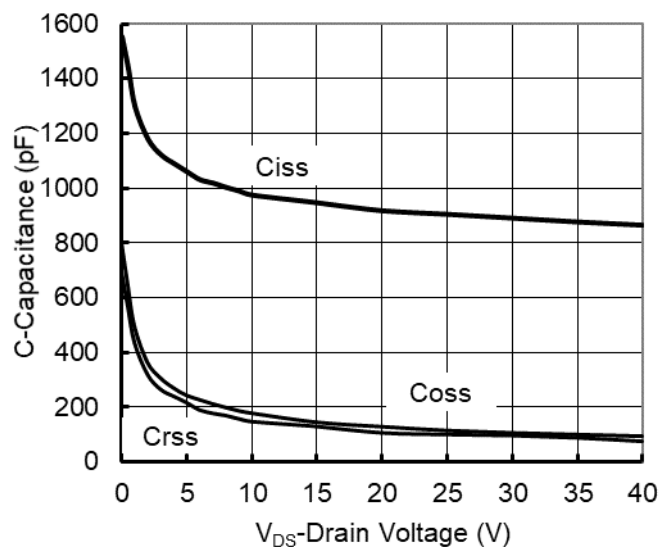


Figure 5. Capacitance Characteristics

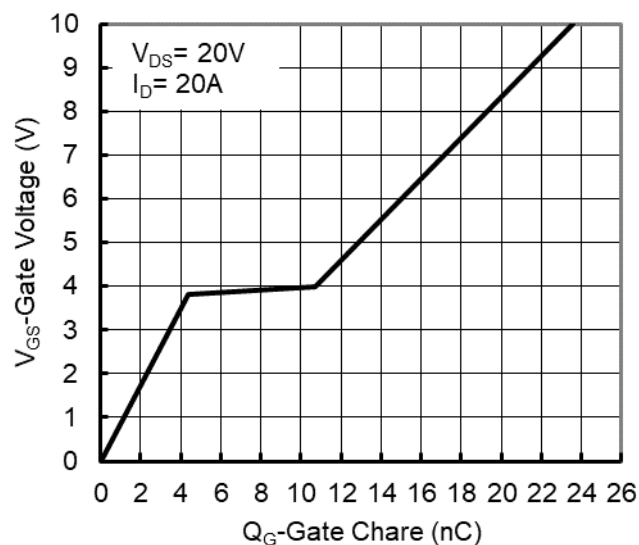


Figure 6. Gate Charge

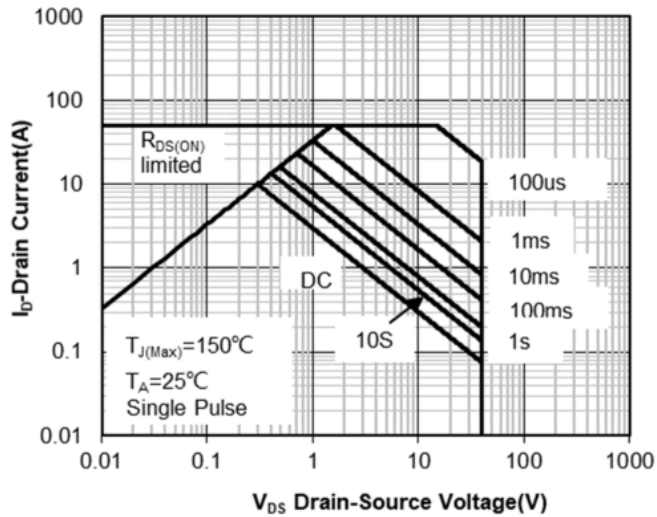


Figure 7. Safe Operation Area

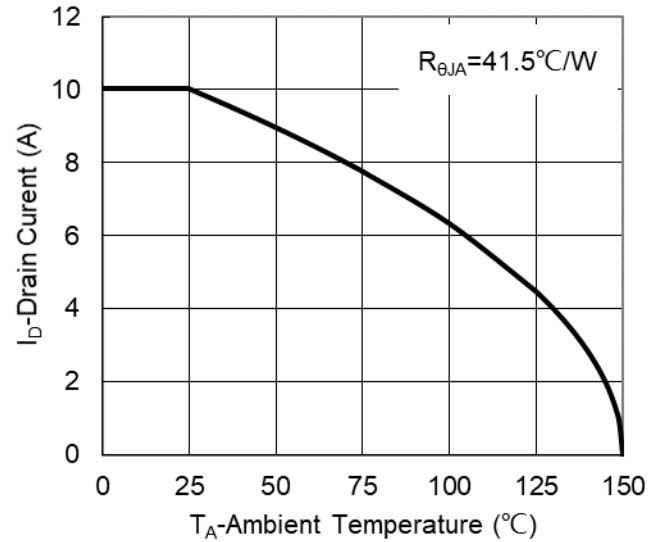


Figure 8. Maximum Continuous Drain Current vs Ambient Temperature

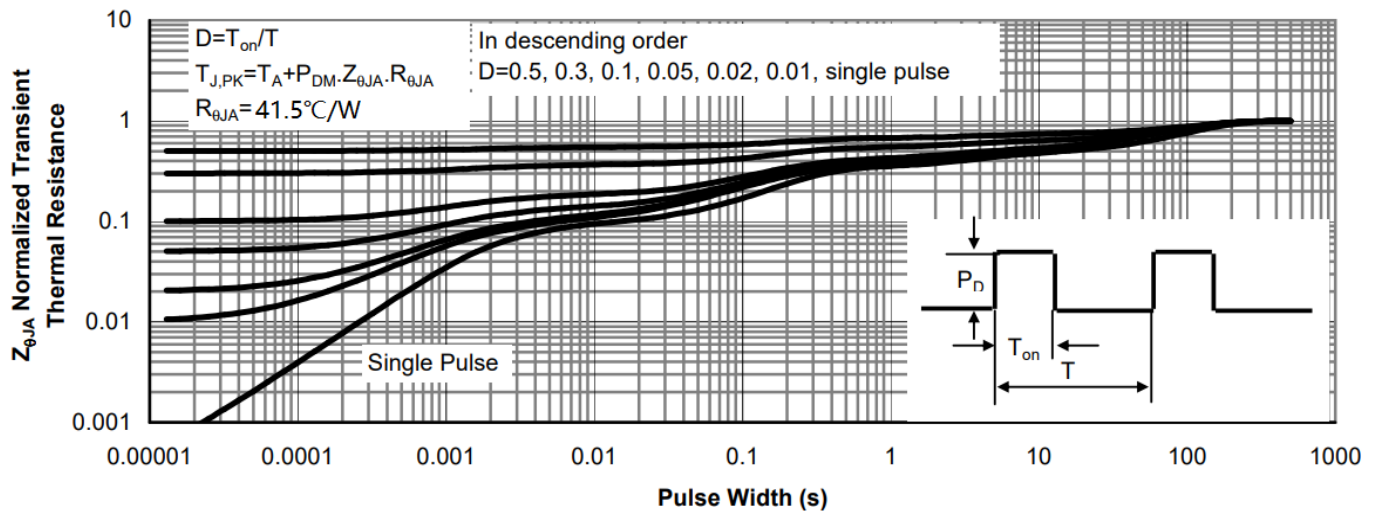
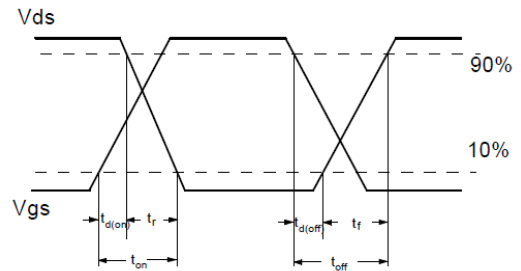
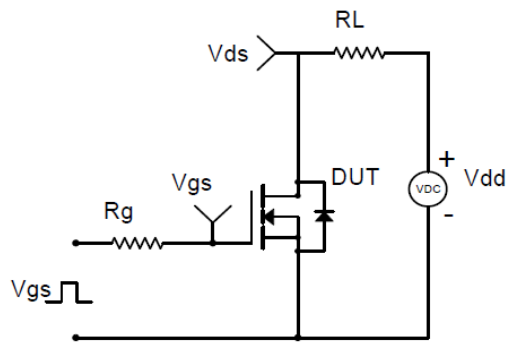
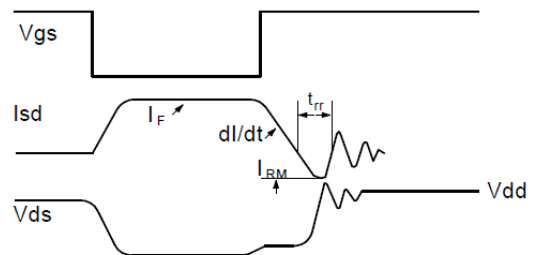
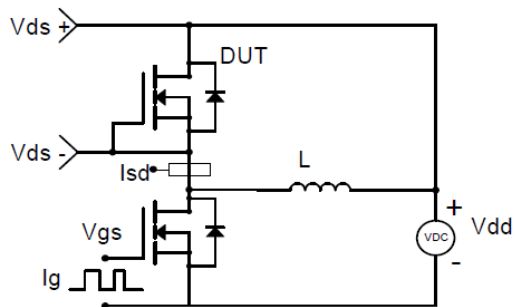


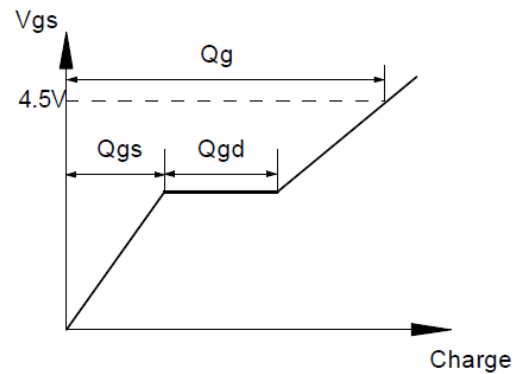
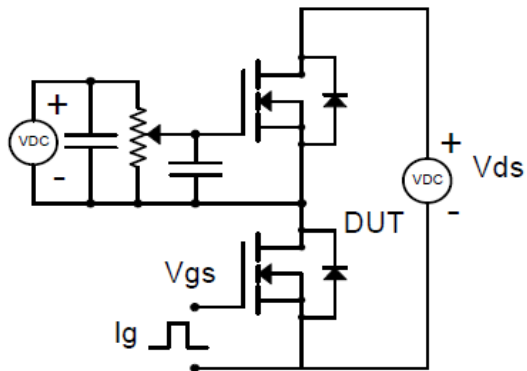
Figure 9. Normalized Maximum Transient Thermal Impedance



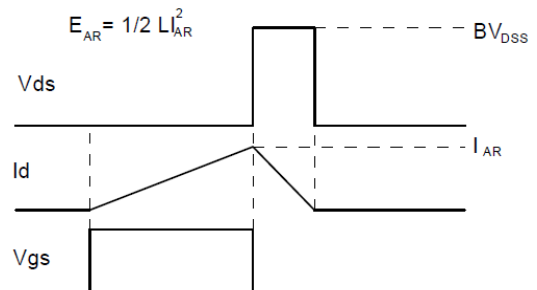
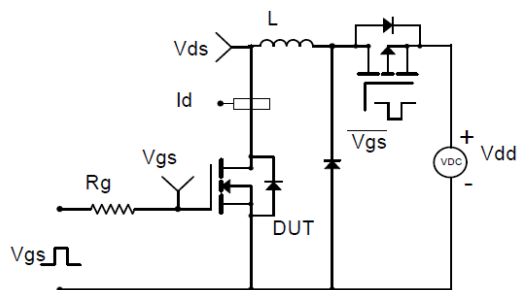
Resistive Switching Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms

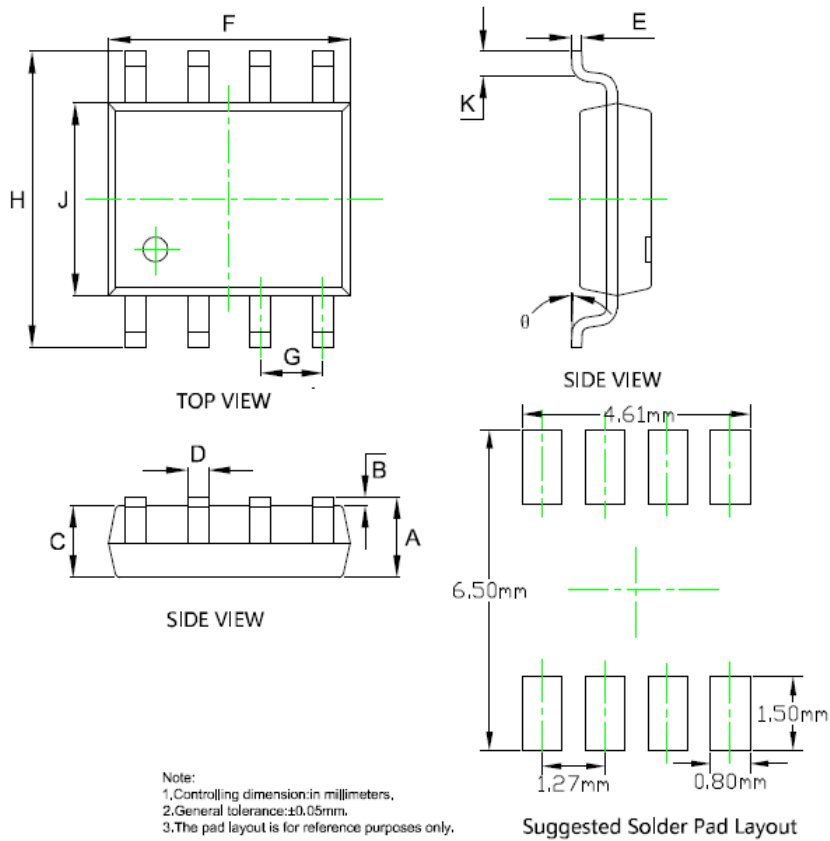


Gate Charge Test Circuit & Waveform



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms

■ SOP-8 Package information



SYMBOL	DIMENSIONS			
	INCHES		Millimeter	
	MIN.	MAX.	MIN.	MAX.
A	0.053	0.069	1.350	1.750
B	0.004	0.010	0.100	0.250
C	0.053	0.061	1.350	1.550
D	0.013	0.020	0.330	0.510
E	0.007	0.010	0.170	0.250
F	0.189	0.197	4.800	5.000
G	0.050BSC		1.270BSC	
H	0.228	0.244	5.800	6.200
J	0.150	0.157	3.800	4.000
K	0.016	0.050	0.400	1.270
θ	0°	8°	0°	8°

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