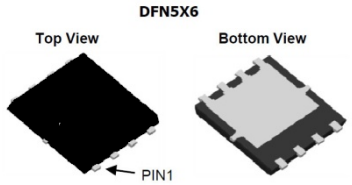
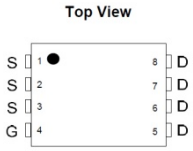
SM95N03A

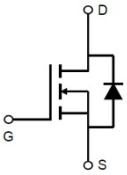
General Description

N-Channel , 5V Logic Level Control
Enhancement mode
Very low on-resistance RDS(on) @ VGS=4.5 V
Pb-free lead plating; RoHS compliant

V_{DS}	30	V
$R_{DS(on),TYP@VGS=10V}$	4.2	mΩ
$R_{DS(on),TYP@VGS=4.5}$	5.9	mΩ
I_D	95	A







Part ID	Package Type	Marking	Tape and reel infomation
SM95N03A	DFN5x6	95N03	3000PCS/Reel

100% UIS Tested
100% Rg Tested

Maximum ratings, at TC =25°C, unless otherwise specified

Symbol	Parameter		Rating	Unit
$V_{(RB)DSS}$	Drain-Source breakdown voltage		30	V
I_S	Diode continuous forward current		95	A
I_D	Continuous drain current@VGS=10V	CT =25°	95	A
		CT =100°	70	A
I_{DM}	Pulse drain current tested ①	CT =25°	300	A
E_{AS}	Avalanche energy, single pulsed ②		450	mJ
P_D	Maximum power dissipation	CT =25°	105	W
V_{GS}	Gate-Source voltage		±20	V
T_{STG} T_J	Storage and operating temperaturerange		-55 to 150	°C

Thermal Characteristics

Symbol	Parameter	Typical	Unit
R JC	Thermal Resistance-Junction to Case	1.1	°C/W
R JA	Thermal Resistance Junction-Ambient	48	°C/W

Thermal Characteristics

Symbol	Parameter	Condition	Min	Typ	Max	Unit
Static Electrical Characteristics @ T j= 25°C (unless otherwise stated)						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	VGS=0V ID=250μA	30	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current(Tc=25℃)	VDS=40V,VGS=0V	--	--	1	μA
	Zero Gate Voltage Drain Current(Tc=125℃)	VDS=40V,VGS=0V	--	--	100	μA
I_{GSS}	Gate-Body Leakage Current	VGS=±20V,VDS=0V	--	--	±100	nA
$V_{GS(TH)}$	Gate Threshold Voltage	VDS=VGS,ID=250μA	1.0	1.8	2.5	V
$R_{DS(ON)}$	Drain-Source On-State Resistance ③	VGS=10V, ID=30A	--	4.2	5	mΩ
		VGS=4.5V, ID=20A	--	4.5	7.5	mΩ
Dynamic Electrical Characteristics @ T j= 25°C (unless otherwise stated)						
C_{iss}	Input Capacitance	VDS=30V,VGS=0V, f=1MHz	--	1690	--	pF
C_{DSS}	Output Capacitance		--	210	--	pF
C_{RSS}	Reverse Transfer Capacitance		--	155	--	pF
Q_g	Total Gate Charge	VDS=20V,ID=20A, VGS=10V	--	36	--	nC
Q_{gs}	Gate-Source Charge		--	11	--	nC
Q_{ds}	Gate-Drain Charge		--	16	--	nC
Switching Characteristics						
$T_{d(on)}$	Turn-on Delay Time	VDD=20V, ID=10A, RG=3.5Ω, VGS=10V	--	13	--	nS
t_r	Turn-on Rise Time		--	15	--	nS
$T_{d(off)}$	Turn-Off Delay Time		--	20	--	nS
t_f	Turn-Off Fall Time		--	14	--	nS
Source- Drain Diode Characteristics@ T j= 25°C (unless otherwise stated)						
V_{SD}	Forward on voltage	ISD=30A,VGS=0V		0.8	1.2	V
t_{rr}	Reverse Recovery Time	Tj=25℃,Isd=20A, di/dt=500A/μs		22		nS
Q_{rr}	Reverse Recovery Charge			13		nC

NOTE:

① Repetitive rating; pulse width limited by max. junction temperature.
② Limited by TJmax, starting TJ = 25°C, L = 0.5mH,RG = 25Ω, IAS = 43A, VGS =10V. Part not recommended for use above this value
③ Pulse width ≤ 300μs; duty cycle≤ 2%.

Typical Characteristics

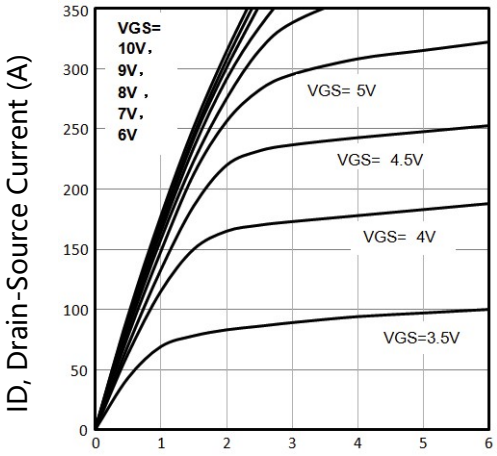


Fig1. Typical Output Characteristics

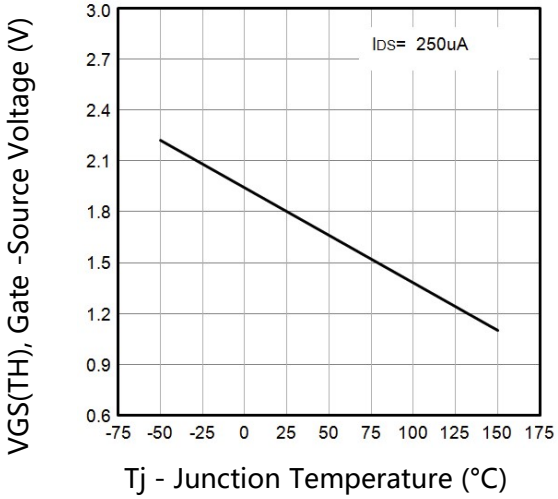


Fig2. VGS(TH) Gate -Source Voltage Vs. Tj

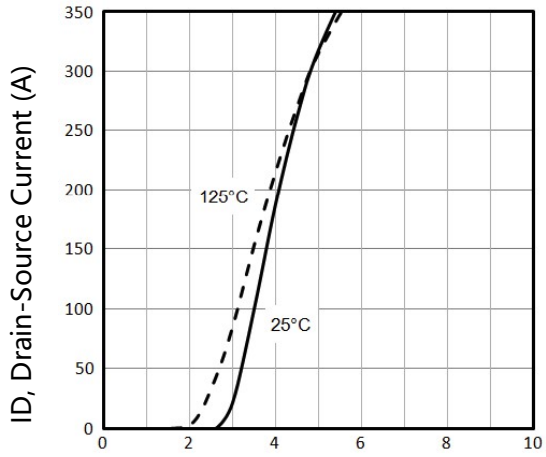


Fig3. Typical Transfer Characteristics

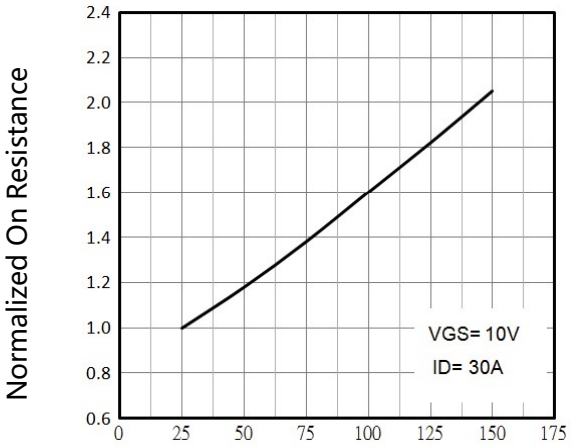


Fig4. Normalized On-Resistance Vs. Tj

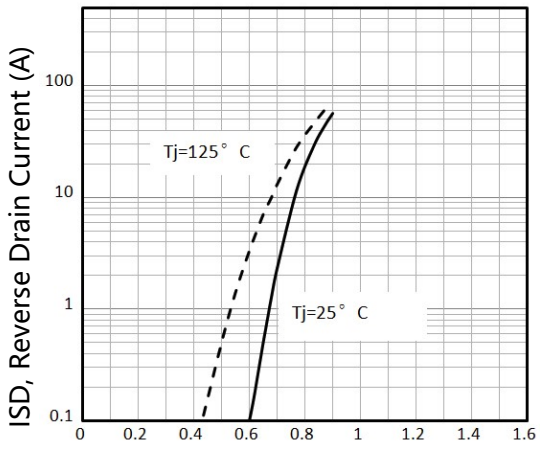


Fig5. Typical Source-Drain Diode Forward Voltage

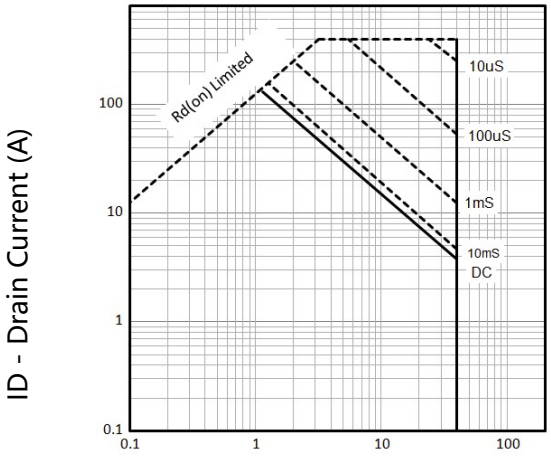


Fig6. Maximum Safe Operating Area

Typical Characteristics

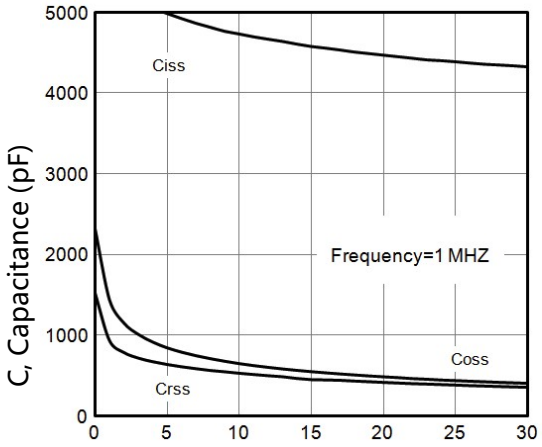


Fig7. Typical Capacitance Vs.Drain-Source Voltage

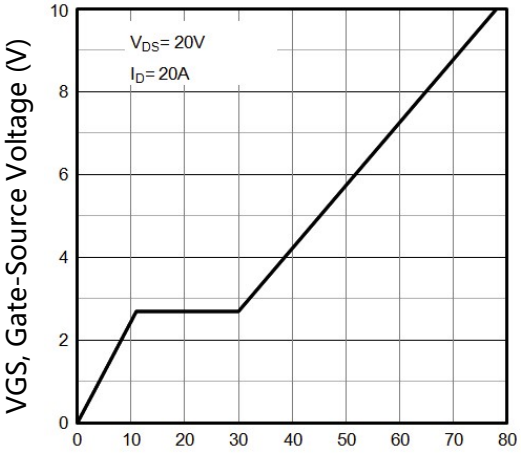


Fig8. Typical Gate Charge Vs.Gate-Source Voltage

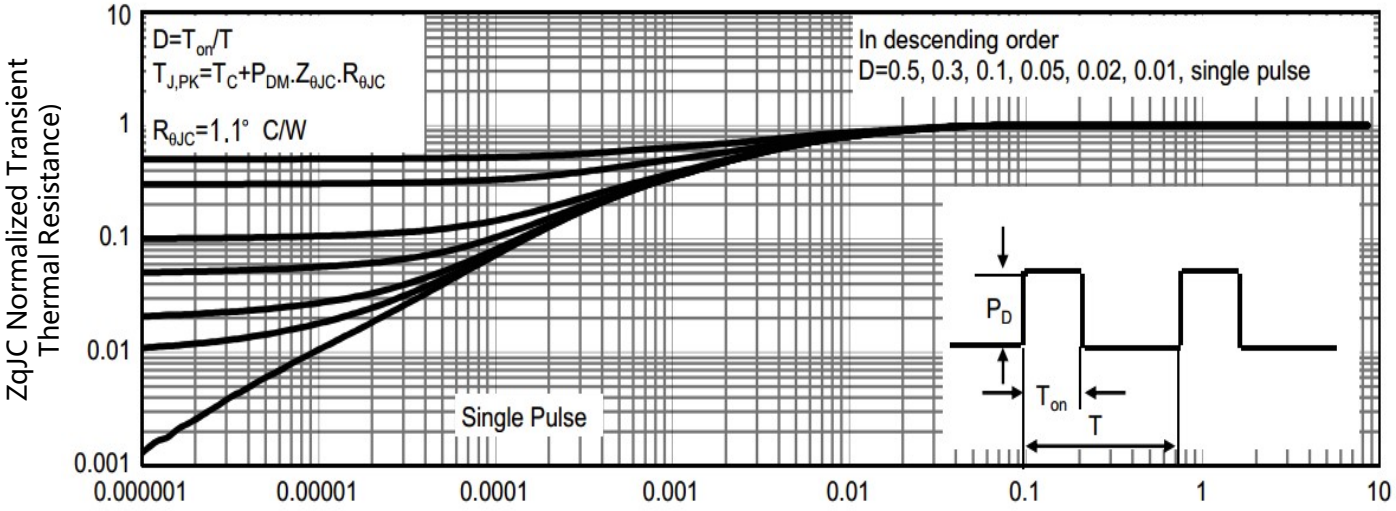


Fig9 . Normalized Maximum Transient Thermal Impedance

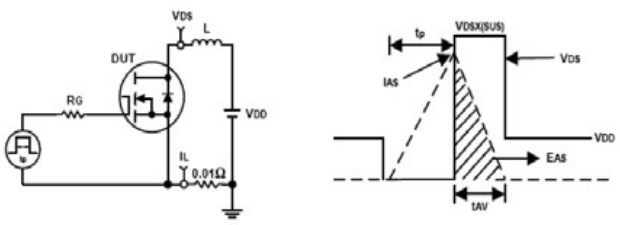


Fig10. Unclamped Inductive Test Circuit and waveforms

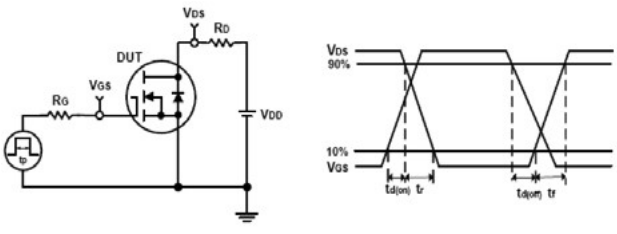
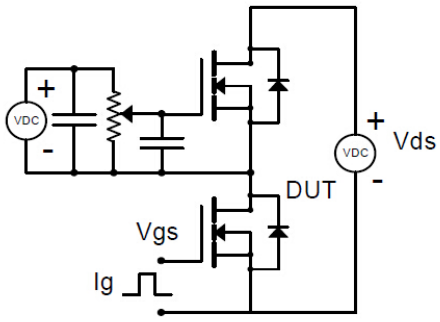
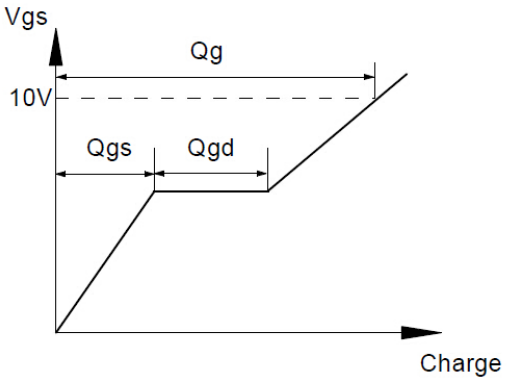


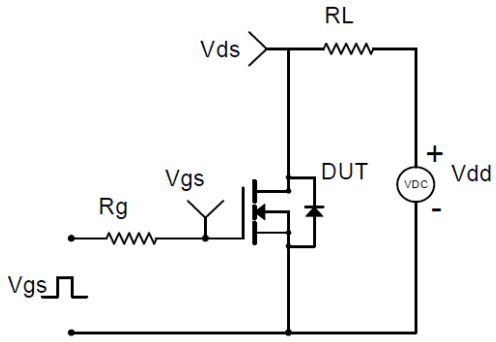
Fig11. Switching Time Test Circuit and waveforms

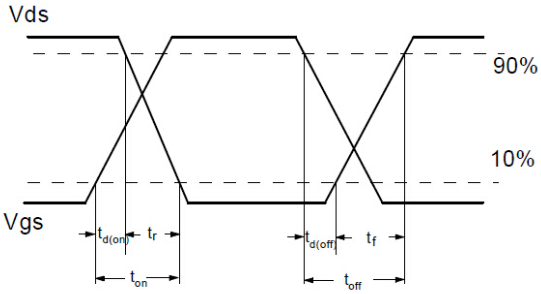
Gate Charge Test Circuit & Waveform



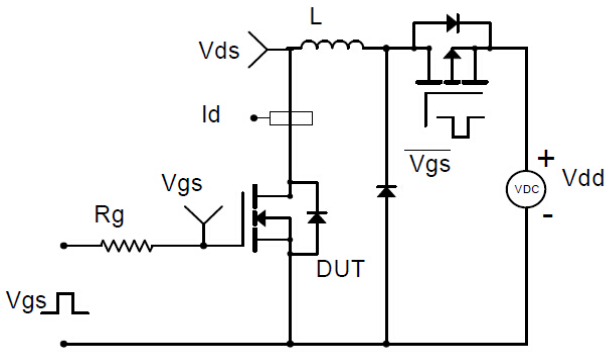


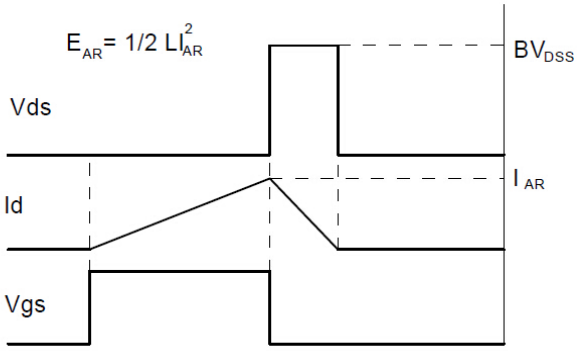
Resistive Switching Test Circuit & Waveforms



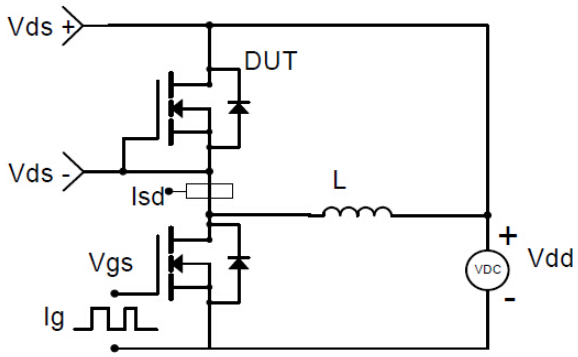


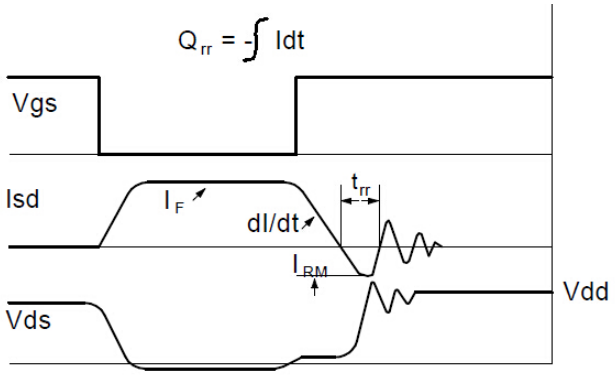
Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



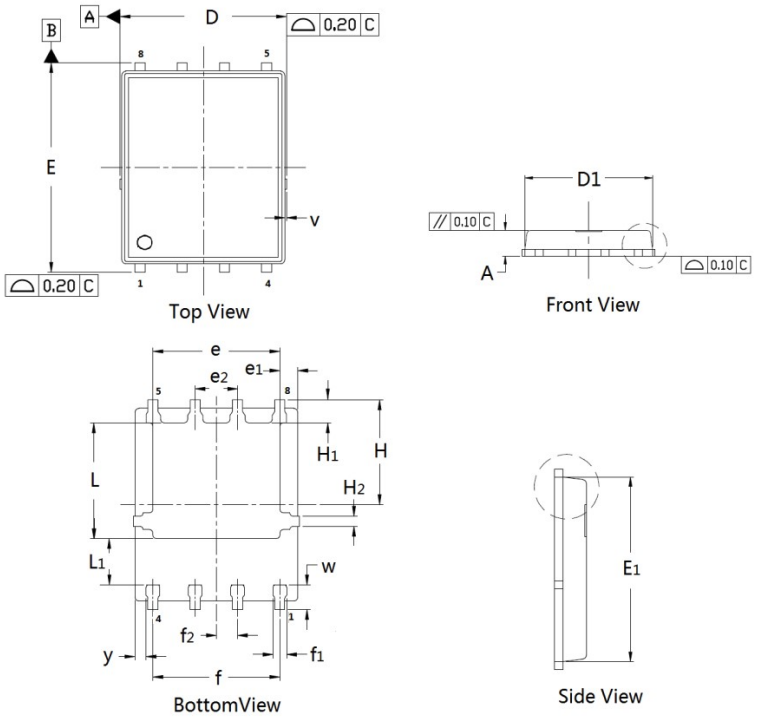


Diode Recovery Test Circuit & Waveforms





DFN5×6 Package Outline Data



DIMENSIONS (unit : mm)

Symbol	Min	Typ	Max	Symbol	Min	Typ	Max
A	0.90	1.02	1.10	**D**	4.90	4.98	5.10
D_1	4.80	4.89	5.00	**E**	6.00	6.11	6.20
E_1	5.65	5.74	5.85	**e**	3.72	3.80	3.92
e_1	--	0.54	--	**e_2**	--	1.27	--
f	--	3.82	--	**f_1**	0.31	0.37	0.51
f_2	--	0.64	--	**H**	--	3.15	--
H_1	0.59	0.63	0.79	**H_2**	0.26	0.28	0.32
L	3.38	3.45	3.58	**L_1**	--	1.39	--
v	--	0.13	--	**w**	0.64	0.68	0.84
y	--	0.34	--		--		--

Customer Service