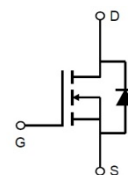
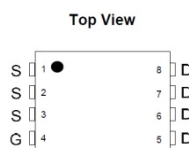
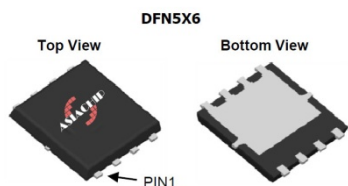


General Description

N-Channel , 5V Logic Level Control
Enhancement mode
Very low on-resistance $R_{DS(on)}$ @ $V_{GS}=4.5\text{ V}$
Pb-free lead plating; RoHS compliant

V_{DS}	40	V
$R_{DS(on),TYP@V_{GS}=10V}$	3.7	mΩ
$R_{DS(on),TYP@V_{GS}=4.5}$	4.6	mΩ
I_D	105	A



Part ID	Package Type	Marking	Tape and reel information
ACD105N04A	DFN5x6		3000PCS/Reel



100% UIS Tested
100% Rg Tested

Maximum ratings, at $T_C = 25^\circ\text{C}$, unless otherwise specified

Symbol	Parameter		Rating	Unit
$V_{(RB)DSS}$	Drain-Source breakdown voltage		40	V
I_S	Diode continuous forward current		105	A
I_D	Continuous drain current@ $V_{GS}=10V$	$T_C = 25^\circ$	105	A
		$T_C = 100^\circ$	70	A
I_{DM}	Pulse drain current tested ①	$T_C = 25^\circ$	400	A
E_{AS}	Avalanche energy, single pulsed ②		450	mJ
P_D	Maximum power dissipation	$T_C = 25^\circ$	105	W
V_{GS}	Gate-Source voltage		± 20	V
$T_{STG} T_J$	Storage and operating temperature range		-55 to 150	$^\circ\text{C}$

Thermal Characteristics

Symbol	Parameter	Typical	Unit
R_{JC}	Thermal Resistance-Junction to Case	1.1	$^\circ\text{C/W}$
R_{JA}	Thermal Resistance Junction-Ambient	48	$^\circ\text{C/W}$

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	40	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current(Tc=25°C)	VDS=40V,VGS=0V	--	--	1	μA
	Zero Gate Voltage Drain Current(Tc=125°C)	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	--	3.7	5.5	mΩ
		VGS=4.5V, ID=20A	--	4.5	7	mΩ
Dynamic Electrical Characteristics @ T j= 25°C (unless otherwise stated)						
C _{iss}	Input Capacitance	VDS=30V,VGS=0V, f=1MHz	--	4290	--	pF
C _{DSS}	Output Capacitance		--	400	--	pF
C _{RSS}	Reverse Transfer Capacitance		--	355	--	pF
Q _g	Total Gate Charge	VDS=20V,ID=20A, VGS=10V	--	78	--	nC
Q _{gs}	Gate-Source Charge		--	11	--	nC
Q _{ds}	Gate-Drain Charge		--	19	--	nC
Switching Characteristics						
T _{d(on)}	Turn-on Delay Time	VDD=20V, ID=10A, RG=3.5Ω, VGS=10V	--	16	--	nS
t _r	Turn-on Rise Time		--	18	--	nS
T _{d(off)}	Turn-Off Delay Time		--	51	--	nS
t _f	Turn-Off Fall Time		--	24	--	nS
Source- Drain Diode Characteristics@ T j= 25°C (unless otherwise stated)						
V _{SD}	Forward on voltage	ISD=30A,VGS=0V		0.82	1.2	V
t _{rr}	Reverse Recovery Time	Tj=25°C,I _{sd} =20A, di/dt=500A/μs		18		nS
Q _{rr}	Reverse Recovery Charge			40		nC

NOTE:

① Repetitive rating; pulse width limited by max. junction temperature.

② Limited by T_{Jmax}, starting T_J = 25°C, L = 0.5mH,R_G = 25Ω, I_{AS} = 43A, V_{GS} = 10V. Part not recommended for use above this value

③ Pulse width ≤ 300μs; duty cycle ≤ 2%.

Typical Characteristics

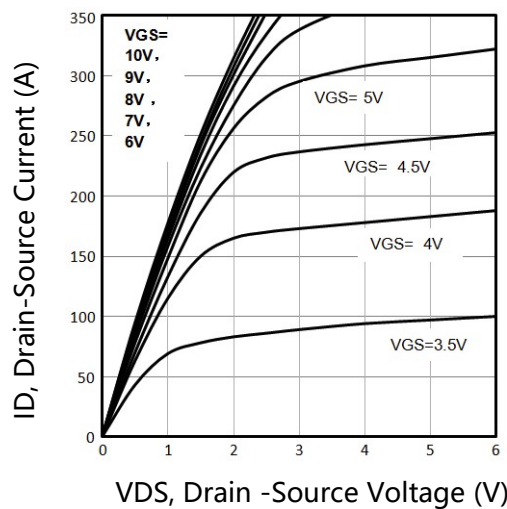


Fig1. Typical Output Characteristics

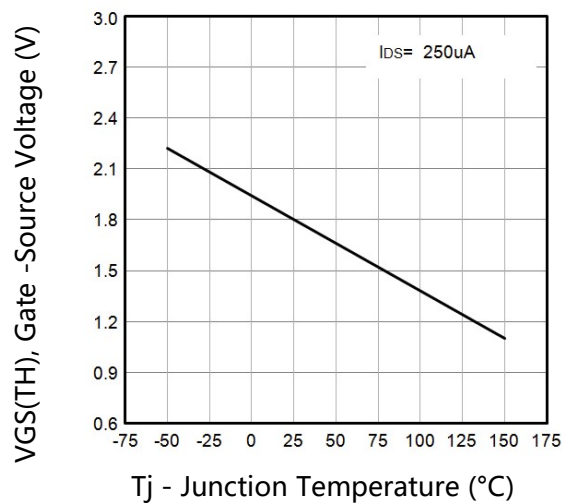


Fig2. VGS(TH) Gate-Source Voltage Vs. Tj

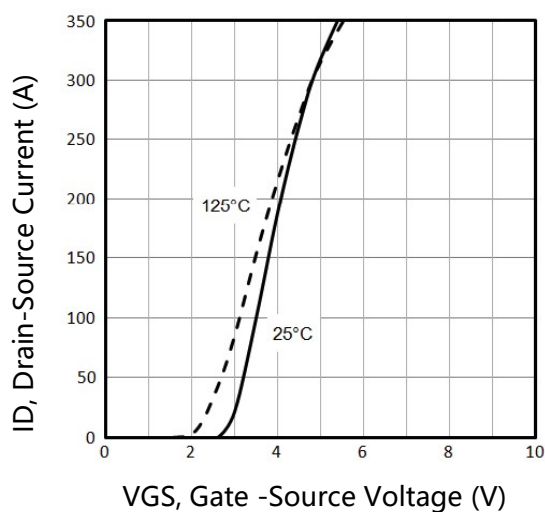


Fig3. Typical Transfer Characteristics

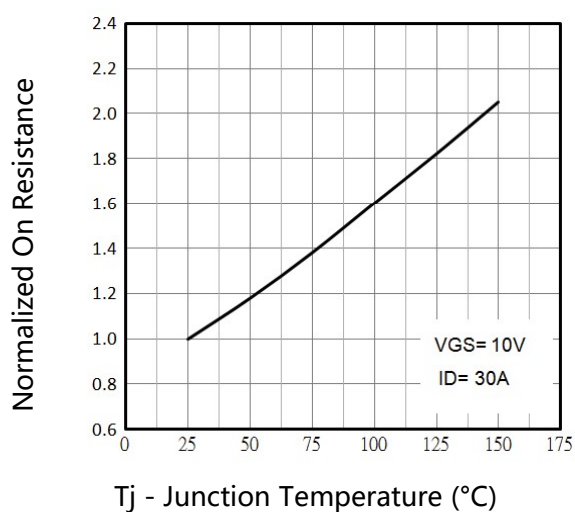


Fig4. Normalized On-Resistance Vs. Tj

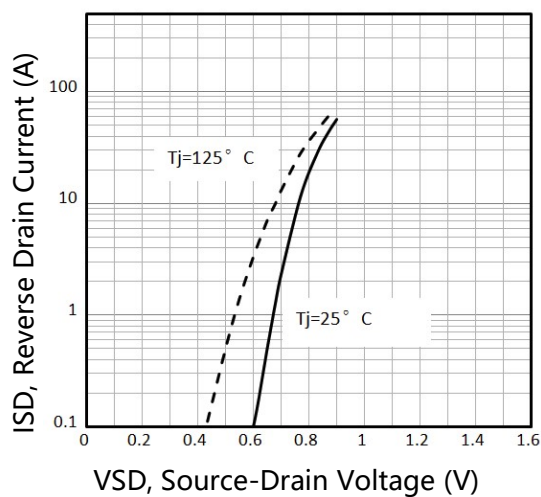


Fig5. Typical Source-Drain Diode Forward Voltage

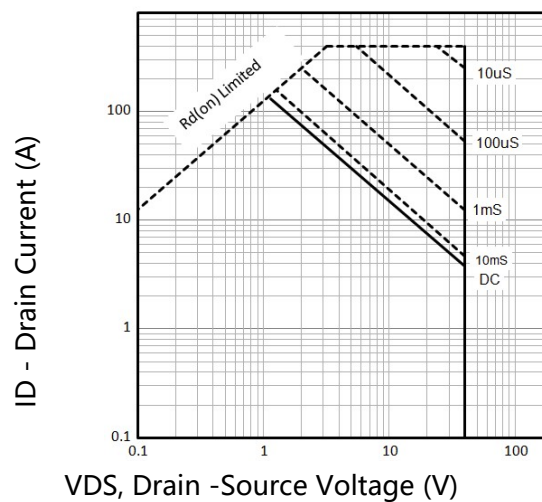


Fig6. Maximum Safe Operating Area

Typical Characteristics

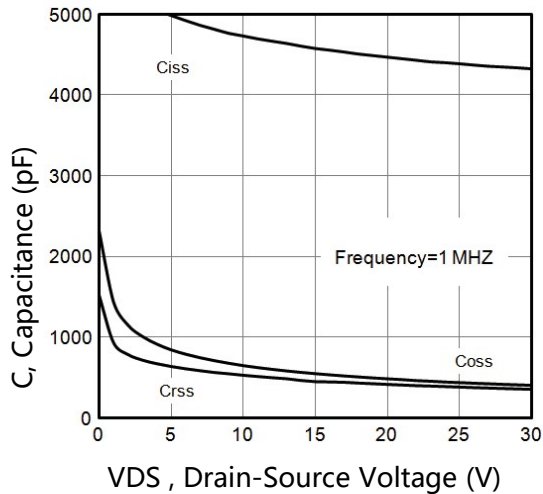


Fig7. Typical Capacitance Vs. Drain-Source Voltage

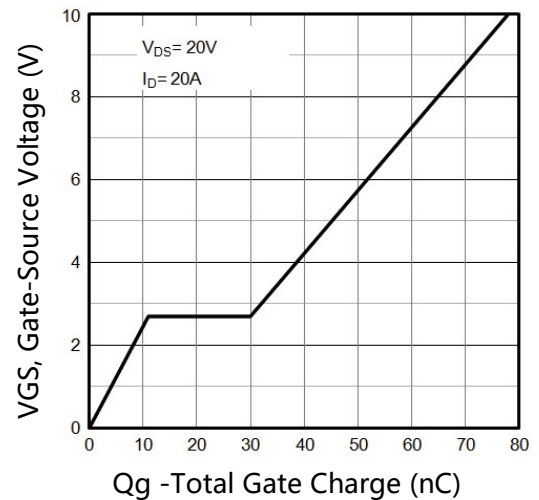


Fig8. Typical Gate Charge Vs. Gate-Source Voltage

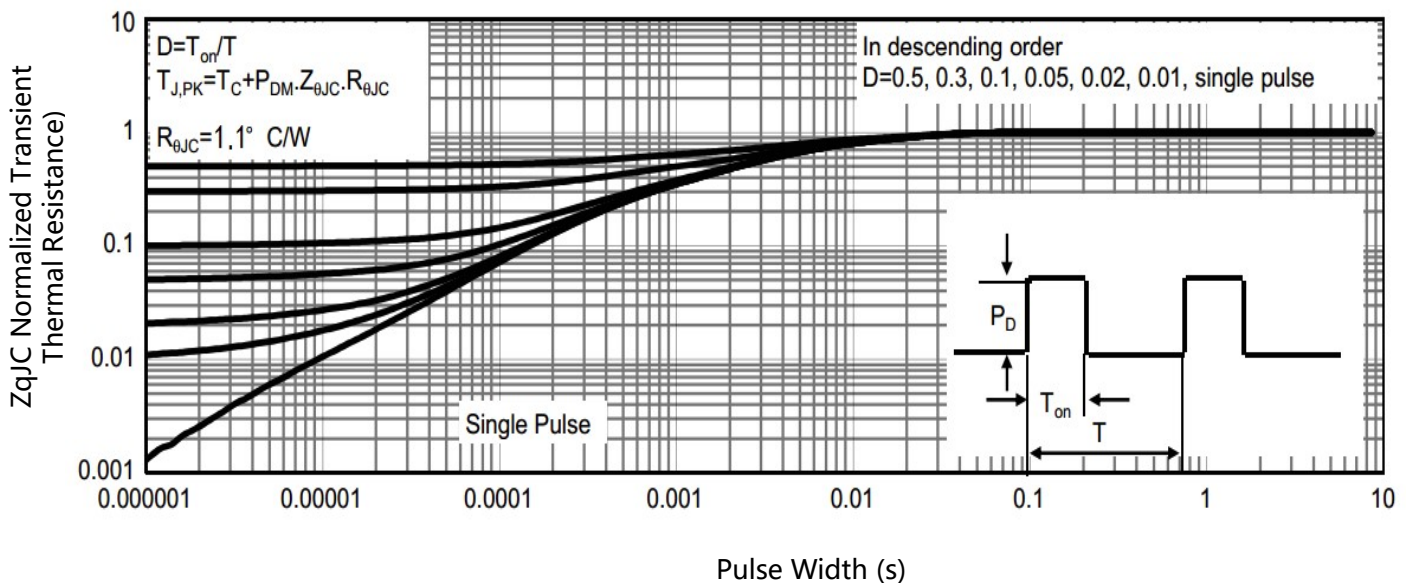


Fig9 . Normalized Maximum Transient Thermal Impedance

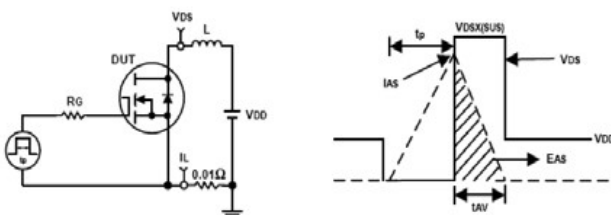


Fig10. Unclamped Inductive Test Circuit and waveforms

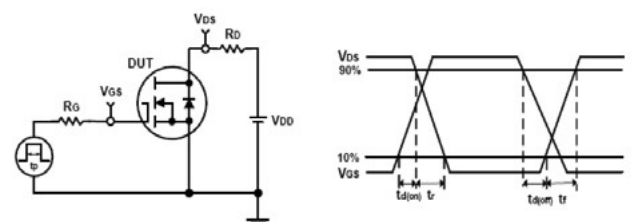
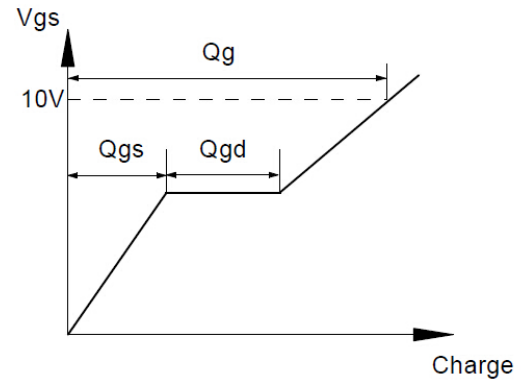
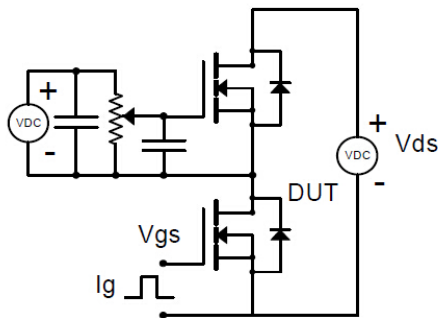
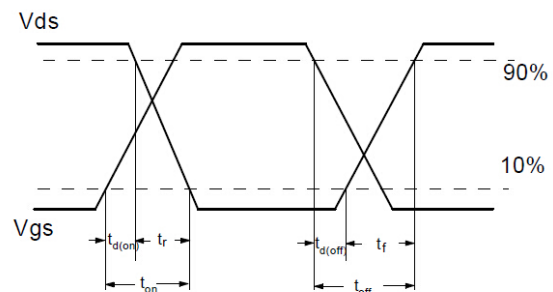
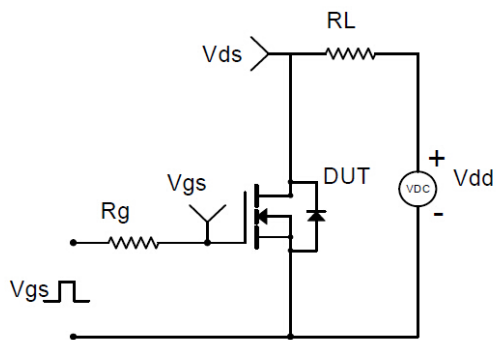


Fig11. Switching Time Test Circuit and waveform

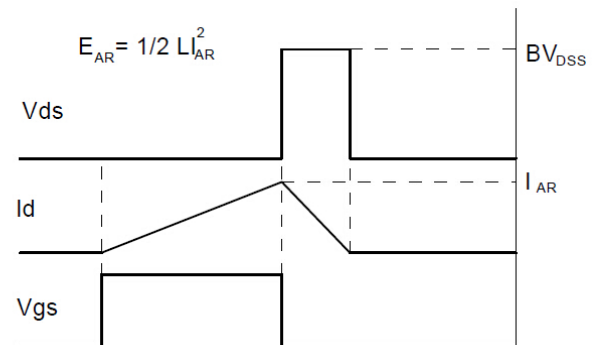
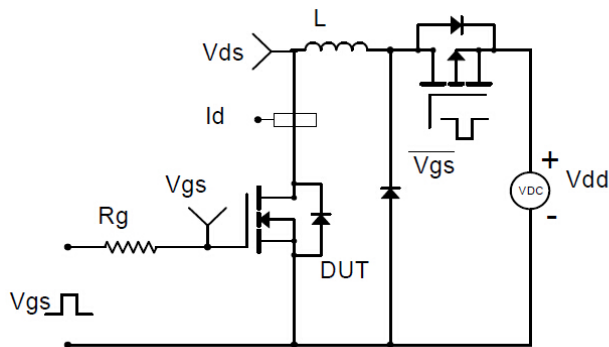
Gate Charge Test Circuit & Waveform



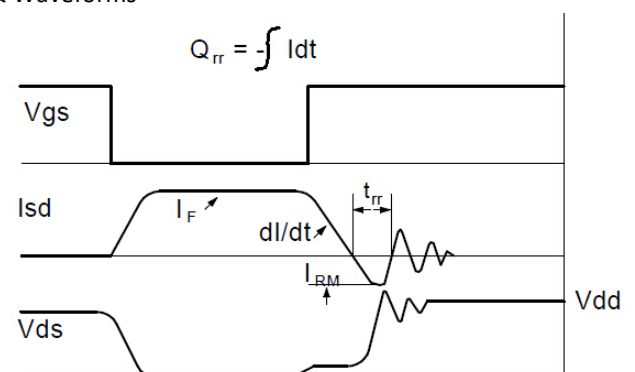
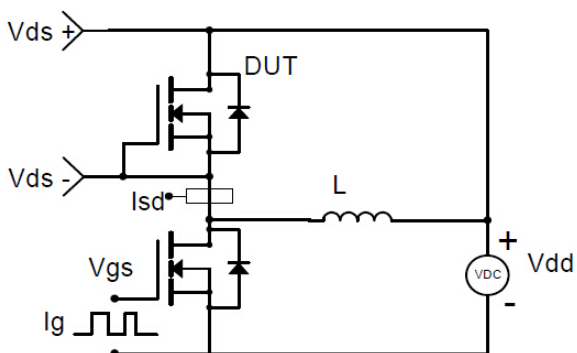
Resistive Switching Test Circuit & Waveforms



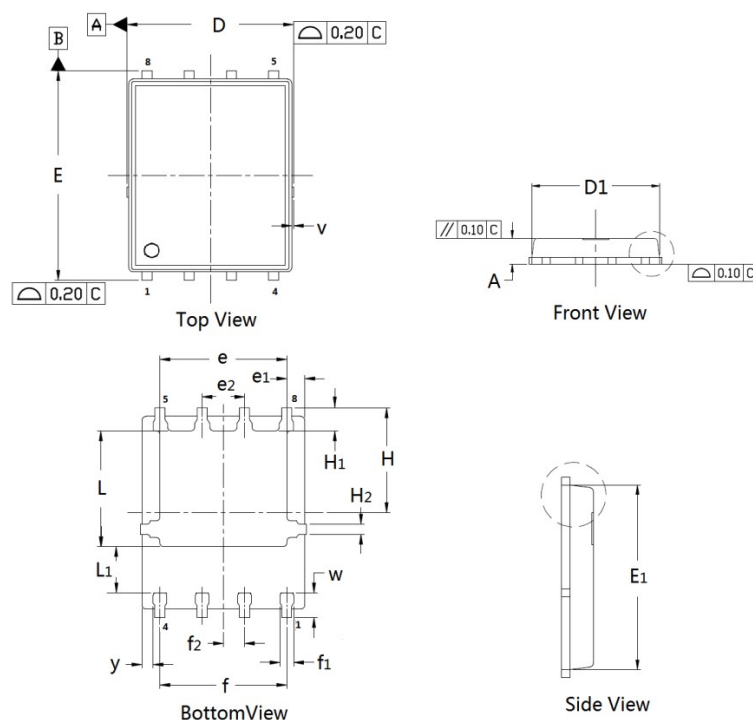
Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



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