Dual N-Channel Advanced Power MOSFET

Features

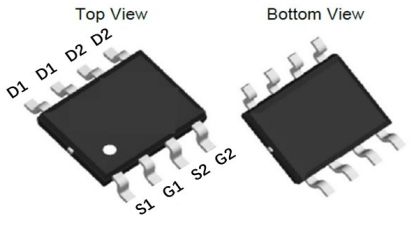
- V_{DS}= 40V, I_D= 11 A
  $R_{DS(ON)}$ < 9 mΩ @ V_{GS} = 10V
  $R_{DS(ON)}$ < 11 mΩ @ V_{GS} = 4.5V

General Features

- Advanced Trench Technology
- Provide Excellent RDS(ON) and Low Gate Charge
- Lead Free and Green Available

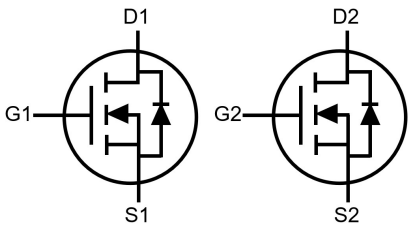
100% UIS TESTED!
100% ΔVds TESTED!

RoHS



SOP-8 (Dual)

Pin Assignment



Schematic diagram

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

Symbol	Parameter		Rating	Unit
$V_{(BR)DSS}$	Drain-Source breakdown voltage		40	V
V_{GS}	Gate-Source voltage		±20	V
I_S	Diode continuous forward current	T_A= 25°C	1.7	A
I_D	Continuous drain current @VGS=10V	T_A= 25°C	11	A
I_D	Continuous drain current @VGS=10V	T_A= 70°C	9	A
I_{DM}	Pulse drain current tested ①	T_A= 25°C	44	A
EAS	Avalanche energy, single pulsed ②		64	mJ
P_D	Maximum power dissipation ③	T_A= 25°C	2	W
		T_A= 70°C	1.3	W
T_{STG},T_J	Storage and Junction Temperature Range		-55 to 150	°C

Thermal Characteristics

Symbol	Parameter		Typical	Max	Unit
$R_{\theta JL}$	Thermal Resistance, Junction-to-Lead		23	28	°C/W
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient④	t≤10s	52	62.5	°C/W
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient④	Steady State	78	94	°C/W

Electrical 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	V_{GS}=0V, I_D=250μA	40	--	--	V
I_{DSS}	Zero Gate Voltage Drain Current(Tj=25℃)	V_{DS}=40V,V_{GS}=0V	--	--	1	μA
	Zero Gate Voltage Drain Current(Tj=125℃) ⑤	V_{DS}=40V,V_{GS}=0V	--	--	100	μA
I_{GSS}	Gate-Body Leakage Current	V_{GS}=±20V,V_{DS}=0V	--	--	±100	nA
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS},I_D=250μA	1.0		2.5	V
$R_{DS(on)}$	Drain-Source On-State Resistance ⑥	V_{GS}=10V, I_D=10A	--		9	mΩ
		Tj=100℃ ⑤	--		10	mΩ
$R_{DS(on)}$	Drain-Source On-State Resistance ⑥	V_{GS}=4.5V, I_D=6A	--		11	mΩ
Dynamic Electrical Characteristics @ T_j= 25°C (unless otherwise stated)						
Ciss	Input Capacitance ⑤	V_{DS}=20V,V_{GS}=0V, f=1MHz	--	870	--	pF
Coss	Output Capacitance ⑤		--	265	--	pF
Crss	Reverse Transfer Capacitance ⑤		--	20	--	pF
Rg	Gate Resistance	f=1MHz	--	1.8	--	Ω
Qg(10V)	Total Gate Charge ⑤	V_{DS}=20V,I_D=10A, V_{GS}=10V	--	13	--	nC
Qg(4.5V)	Total Gate Charge ⑤		--	6.3	--	nC
Qgs	Gate-Source Charge ⑤		--	2.7	--	nC
Qgd	Gate-Drain Charge ⑤		--	1.6	--	nC
Switching Characteristics ⑤						
Td(on)	Turn-on Delay Time	V_{DD}=20V, I_D=10A, R_G=3Ω, V_{GS}=10V	--	5.6	--	ns
Tr	Turn-on Rise Time		--	29	--	ns
Td(off)	Turn-Off Delay Time		--	15	--	ns
Tf	Turn-Off Fall Time		--	4.6	--	ns
Source- Drain Diode Characteristics@ T_j = 25°C (unless otherwise stated)						
V_{SD}	Forward on voltage	I_{SD}=10A,V_{GS}=0V	--	0.8	1.2	V
Trr	Reverse Recovery Time ⑤	I_{sd}=10A, V_{GS}=0V di/dt=100A/μs	--	18	--	ns
Qrr	Reverse Recovery Charge ⑤		--	7	--	nC

NOTE:

① Single pulse; pulse width ≤ 100μs.

② EAS of 64mJ is based on starting T_J = 25°C, L = 0.5mH, R_G = 25Ω, I_{AS} = 16A, V_{GS} =10V； 100% FT tested at L = 0.5mH, I_{AS} = 9A.

③ The power dissipation Pdsm is based on Tj(max), using junction-to-ambient thermal resistance RθJA.

④ These tests are performed with the device mounted on 1 in2 FR-4 board with 2oz. Copper, in a still air environment with TA=25°C.

⑤ Guaranteed by design, not subject to production testing.

⑥ Pulse width ≤ 380μs; duty cycle≤ 2%.

Typical Characteristics

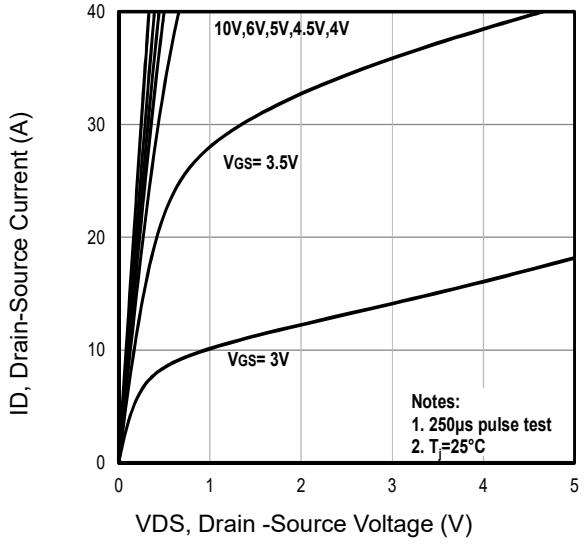


Fig1. Typical Output Characteristics

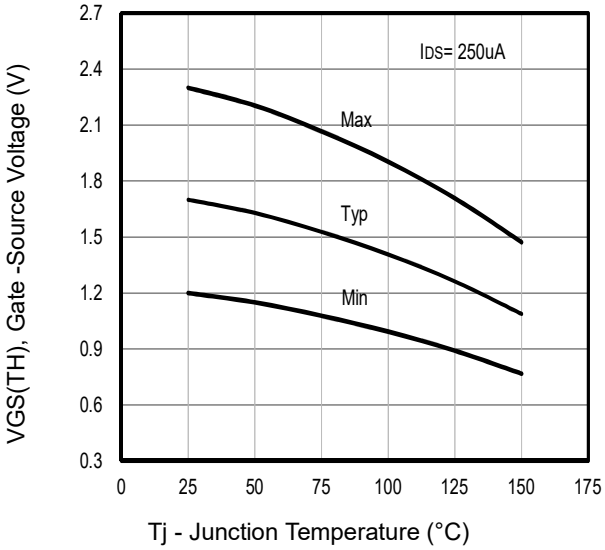


Fig2. Typical $V_{GS(TH)}$ Gate -Source Voltage Vs. Tj

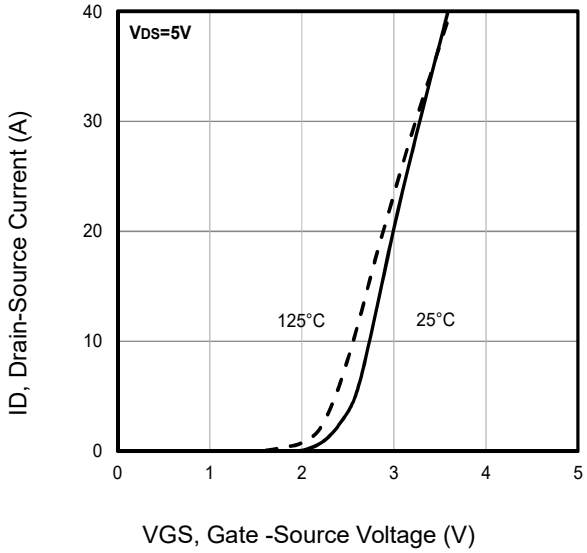


Fig3. Typical Transfer Characteristics

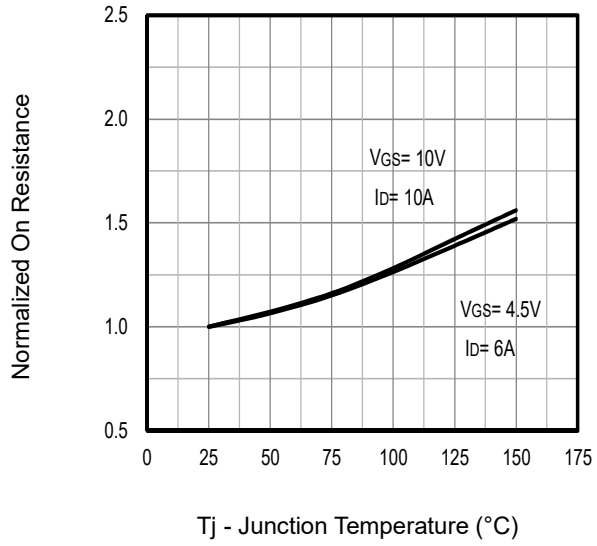


Fig4. Typical Normalized On-Resistance Vs. Tj

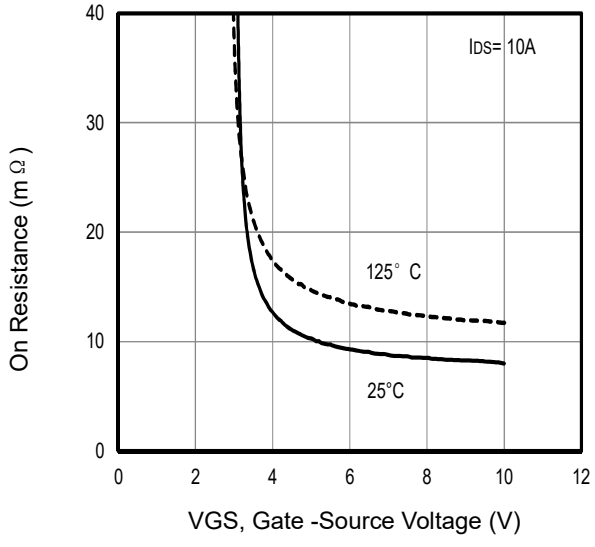


Fig5. Typical On Resistance Vs Gate -Source Voltage

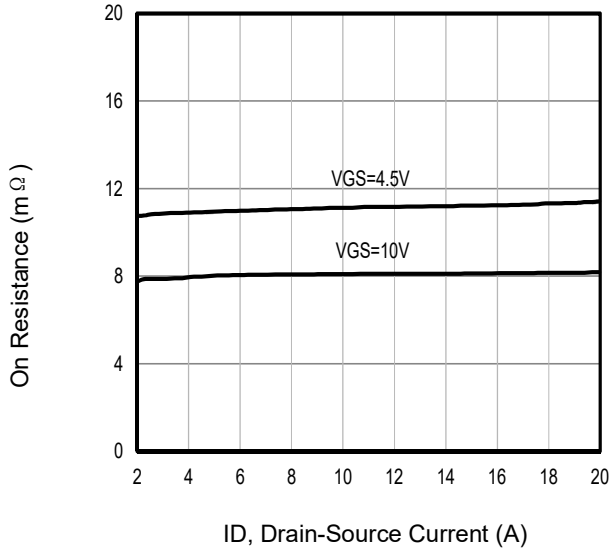


Fig6. Typical On Resistance Vs Drain Current

Typical Characteristics

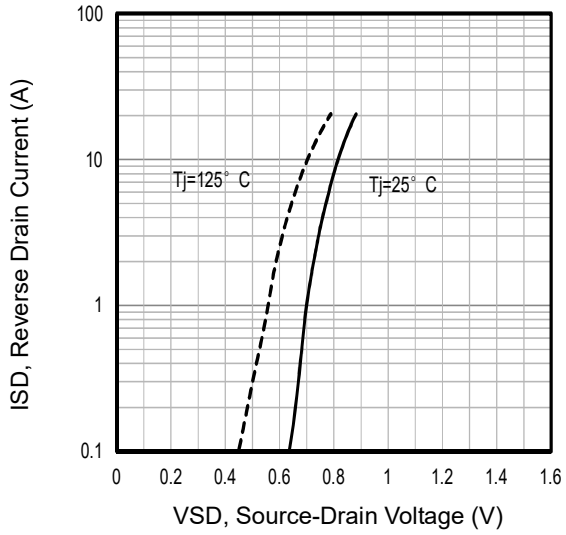


Fig7. Typical Source-Drain Diode Forward Voltage

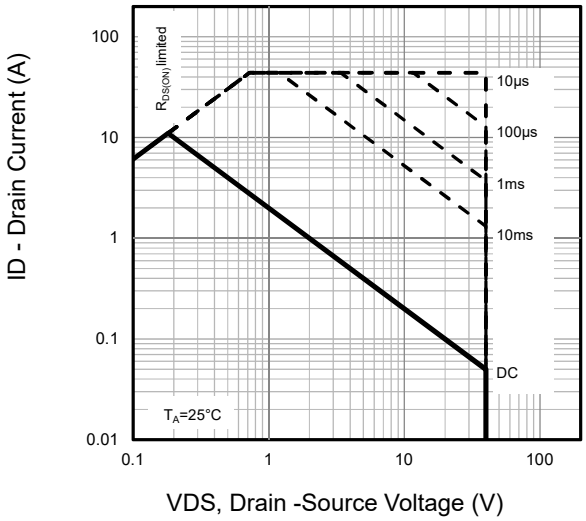


Fig8. Maximum Safe Operating Area

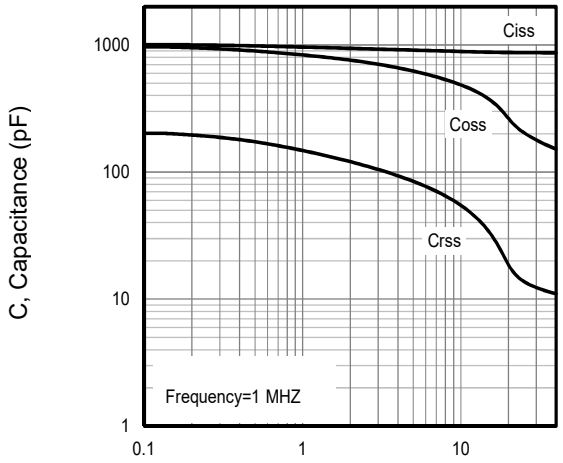


Fig9. Typical Capacitance Vs. Drain-Source Voltage

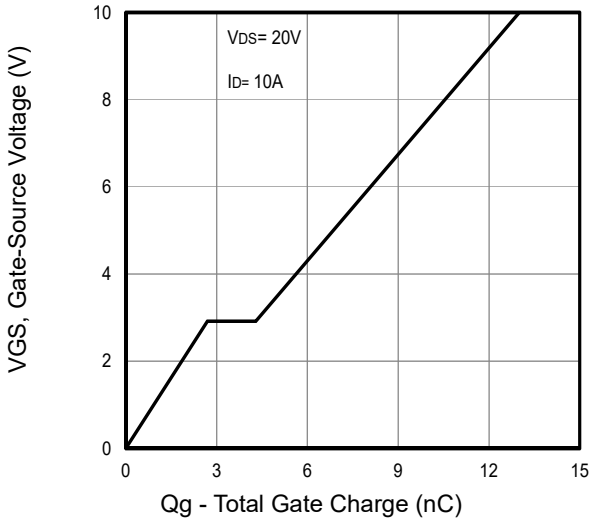


Fig10. Typical Gate Charge Vs. Gate-Source Voltage

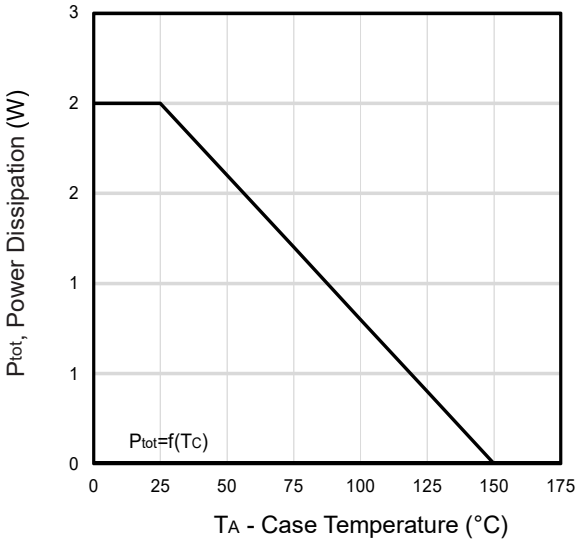


Fig11. Power Dissipation Vs. Case Temperature

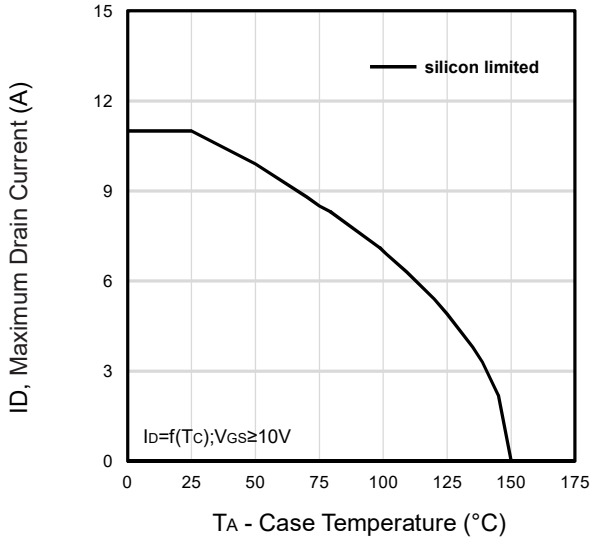


Fig12. Maximum Drain Current Vs. Case Temperature

Typical Characteristics

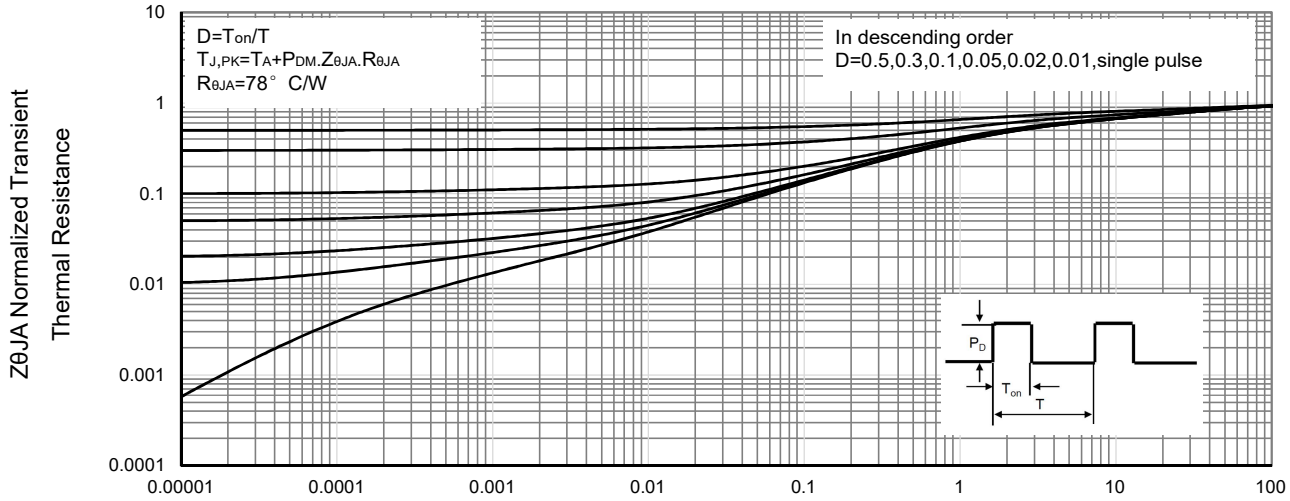


Fig13 . Normalized Maximum Transient Thermal Impedance

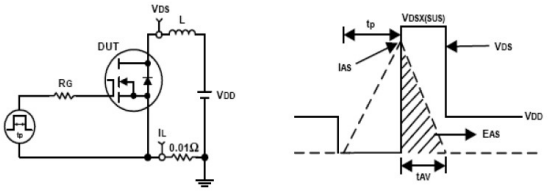


Fig14. Unclamped Inductive Test Circuit and waveforms

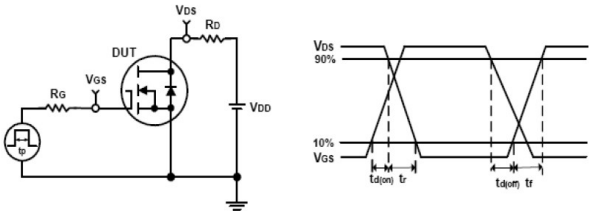


Fig15. Switching Time Test Circuit and waveforms