N-Channel Enhancement Mode Power MOSFET

Features

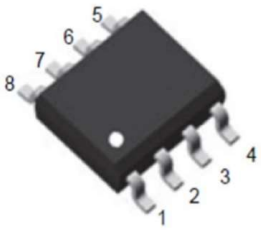
- V_{DS}= 40V, I_D= 14 A
  $R_{DS(ON)}$ < 10 mΩ @ V_{GS} = 10V
  $R_{DS(ON)}$ < 17 mΩ @ V_{GS} = 4.5V

General Features

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

100% UIS TESTED!
100% ΔVds TESTED!

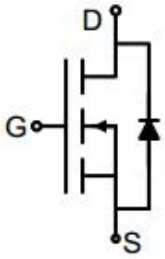
RoHS



SOP-8



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	3.8	A
I_D	Continuous drain current @VGS=10V	T_A =25°C	14	A
		T_A =100°C	9	A
I_{DM}	Pulse drain current tested ①	T_A =25°C	56	A
P_D	Maximum power dissipation	T_A =25°C	3.1	W
MSL			Level 3	
T_{STG}, T_J	Storage and junction temperature range		-55 to 150	°C

Thermal Characteristics

Symbol	Parameter	Typical	Unit
$R_{\theta JL}$	Thermal Resistance, Junction-to-Lead	24	°C/W
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	40	°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	V_{DS}=40V,V_{GS}=0V	--	--	1	uA
	Zero Gate Voltage Drain Current(T_j=125℃)	V_{DS}=40V,V_{GS}=0V	--	--	100	uA
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		3.0	V
$R_{DS(ON)}$	Drain-Source On-State Resistance②	V_{GS}=10V, I_D=10A	--		10	mΩ
$R_{DS(ON)}$	Drain-Source On-State Resistance②	V_{GS}=4.5V, I_D=6A	--		17	mΩ
Dynamic Electrical Characteristics @ T_j = 25°C (unless otherwise stated)						
C_{iss}	Input Capacitance	V_{DS}=20V,V_{GS}=0V, f=1MHz	1115	1315	1515	pF
C_{oss}	Output Capacitance		85	100	115	pF
C_{rss}	Reverse Transfer Capacitance		65	80	95	pF
R_g	Gate Resistance	f=1MHz	--	1.7	--	Ω
Q_g (10V)	Total Gate Charge	V_{DS}=20V,I_D=10A, V_{GS}=10V	--	22	--	nC
Q_g (4.5V)	Total Gate Charge		--	12	--	nC
Q_{gs}	Gate-Source Charge		--	4.5	--	nC
Q_{gd}	Gate-Drain Charge		--	4.2	--	nC
Switching Characteristics						
$t_{d(on)}$	Turn-on Delay Time	V_{DD}=20V, I_D=10A, R_G=3.0Ω, V_{GS}=10V	--	7.5	--	ns
t_r	Turn-on Rise Time		--	3.8	--	ns
$t_{d(off)}$	Turn-Off Delay Time		--	24	--	ns
t_f	Turn-Off Fall Time		--	5.5	--	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
t_{rr}	Reverse Recovery Time	T_j=25℃,I_{sd}=10A, V_{GS}=0V di/dt=500A/μs	--	8.5	--	ns
Q_{rr}	Reverse Recovery Charge		--	8	--	nC

NOTE:

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

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

Typical Characteristics

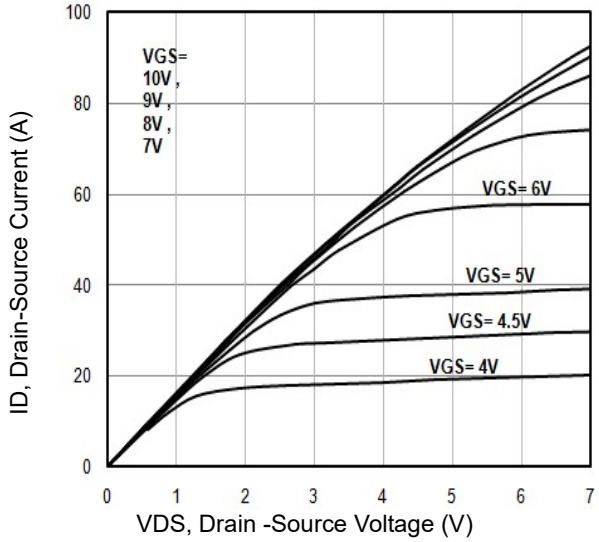


Fig1. Typical Output Characteristics

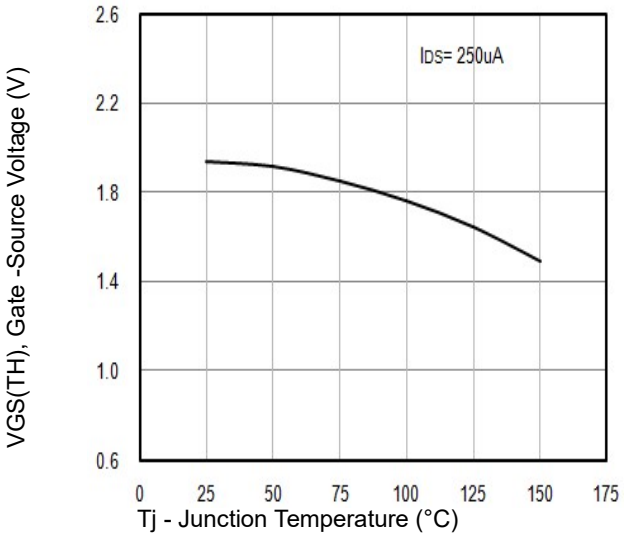


Fig2. $V_{GS(TH)}$ Gate -Source Voltage Vs. Tj

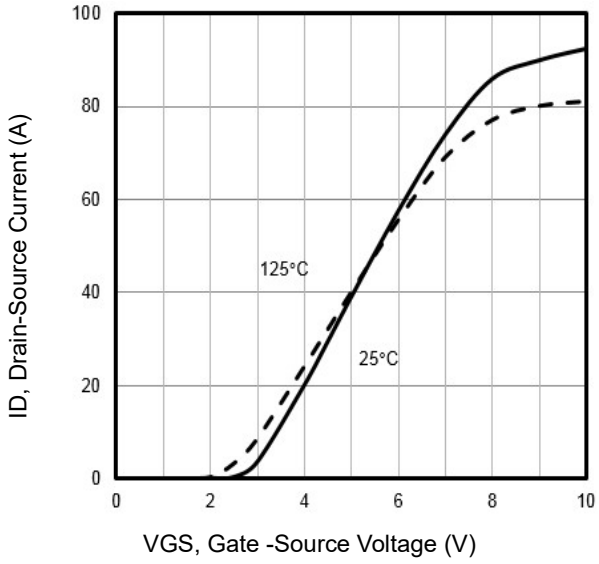


Fig3. Typical Transfer Characteristics

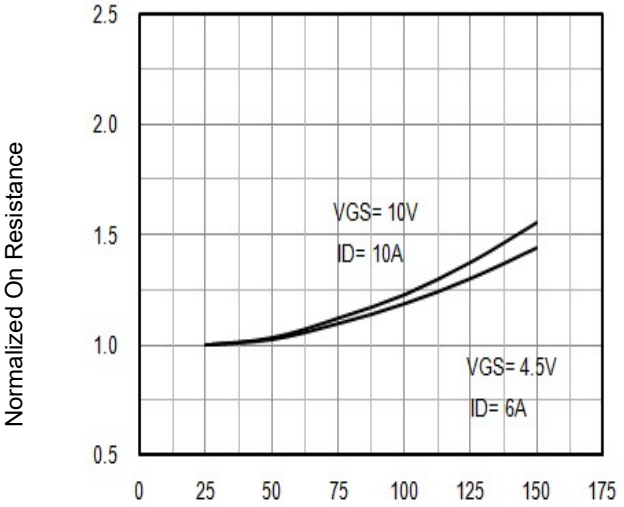


Fig4. Normalized On-Resistance Vs. Tj

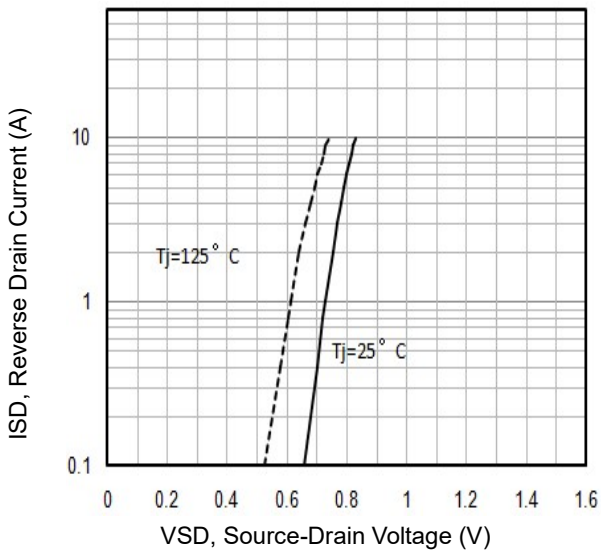


Fig5. Typical Source-Drain Diode Forward Voltage

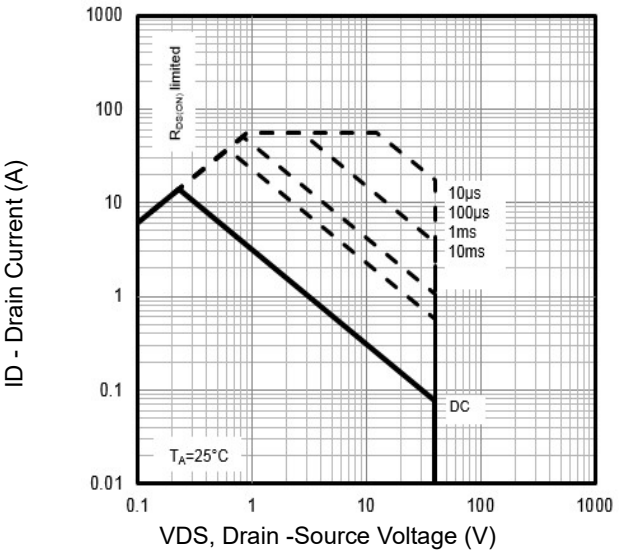


Fig6. Maximum Safe Operating Area

Typical Characteristics

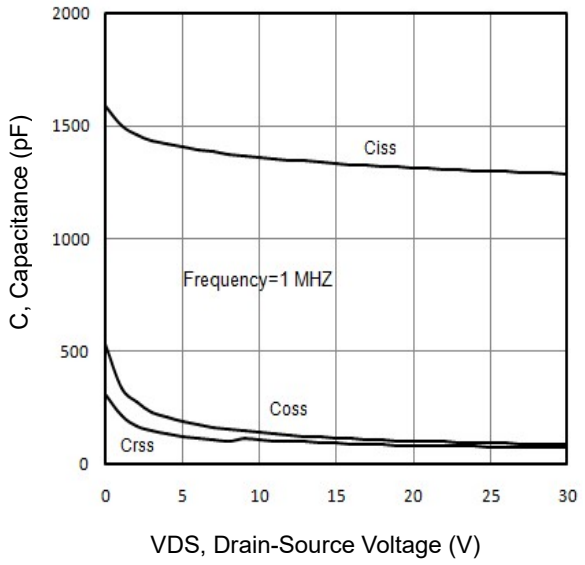


Fig7. Typical Capacitance Vs. Drain-Source Voltage

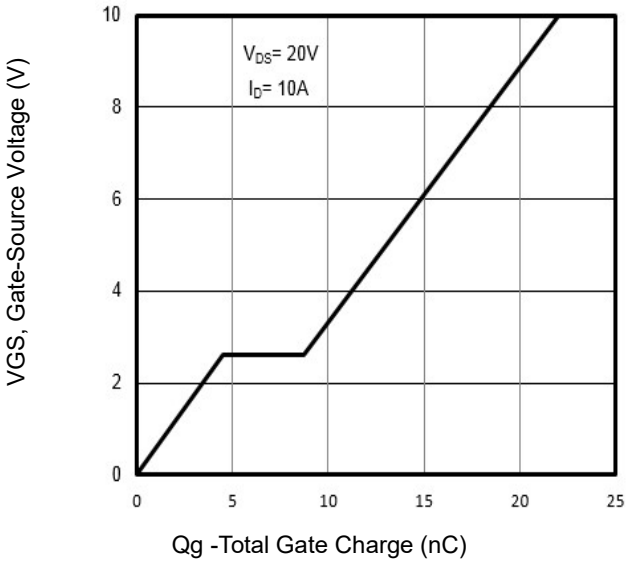


Fig8. Typical Gate Charge Vs. Gate-Source Voltage

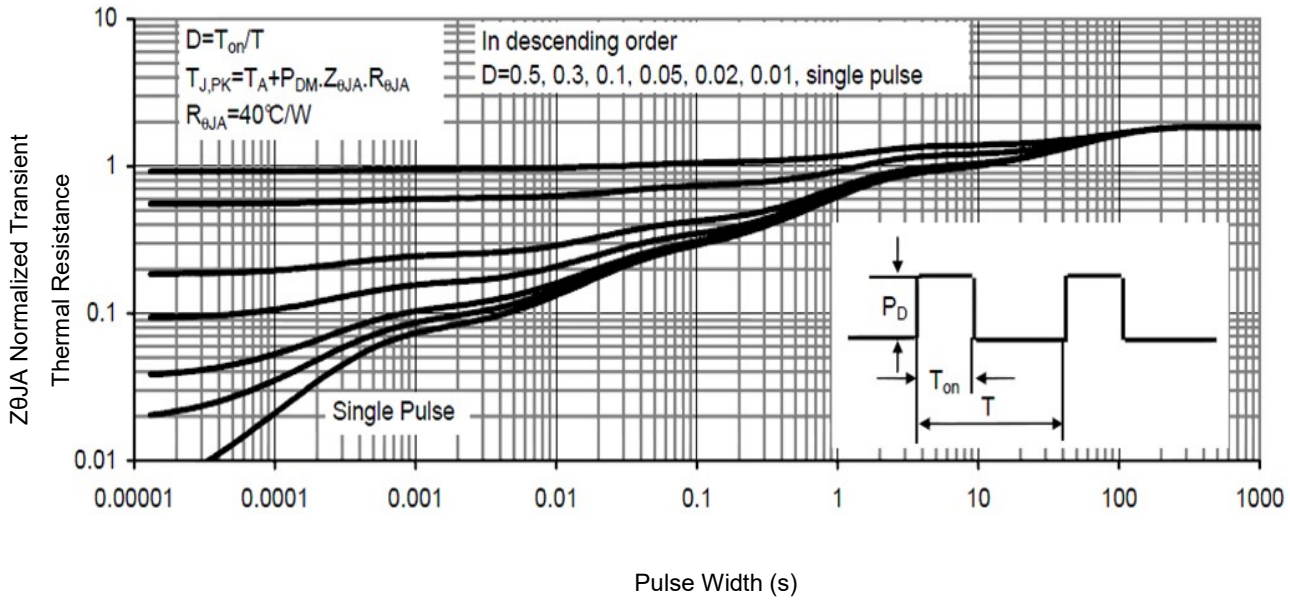


Fig9. Normalized Maximum Transient Thermal Impedance

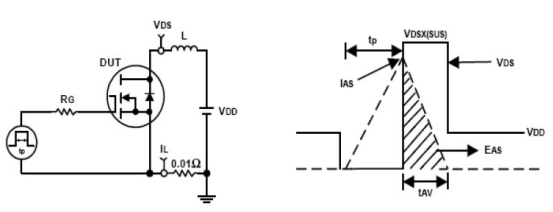


Fig10. Unclamped Inductive Test Circuit and waveforms

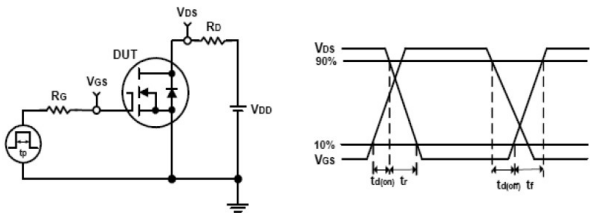


Fig11. Switching Time Test Circuit and waveforms