

N-Channel Enhancement Mode Power MOSFET

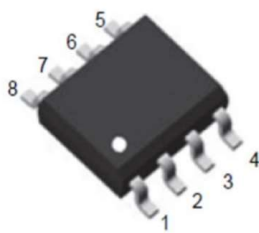
Features

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

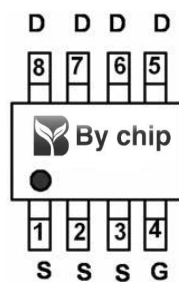
General Features

- Advanced Trench Technology
- Provide Excellent $R_{DS(ON)}$ and Low Gate Charge
- Lead Free and Green Available

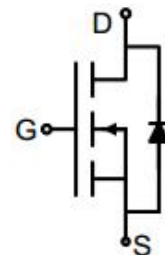
100% UIS TESTED!
100% ΔV_{ds} TESTED!



SOP-8



pin assignment



Schematic diagram

Maximum ratings, at $T_A = 25^\circ C$, 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 @V _{GS} =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	$^\circ C/W$
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	40	$^\circ C/W$

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°C)	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°C, I _{SD} =10A, V _{GS} =0V	--	8.5	--	ns
Q _{rr}	Reverse Recovery Charge	di/dt=500A/μs	--	8	--	nC

NOTE:

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

② Pulse width $\leq 300\mu s$; duty cycle $\leq 2\%$.

Typical Characteristics

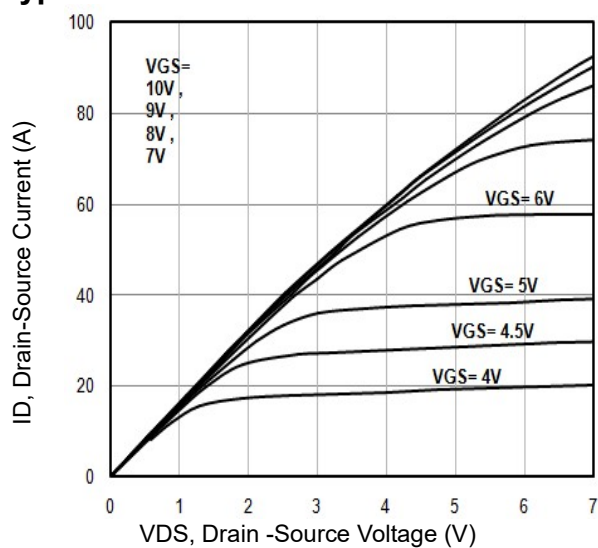


Fig1. Typical Output Characteristics

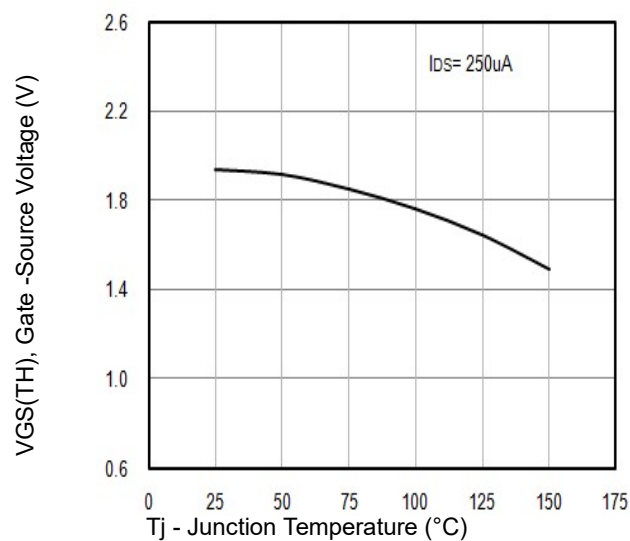


Fig2. $V_{GS(TH)}$ Gate -Source Voltage Vs. T_J

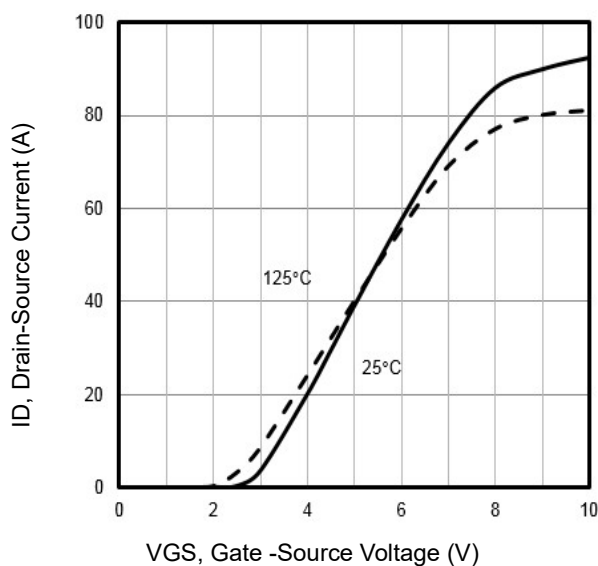


Fig3. Typical Transfer Characteristics

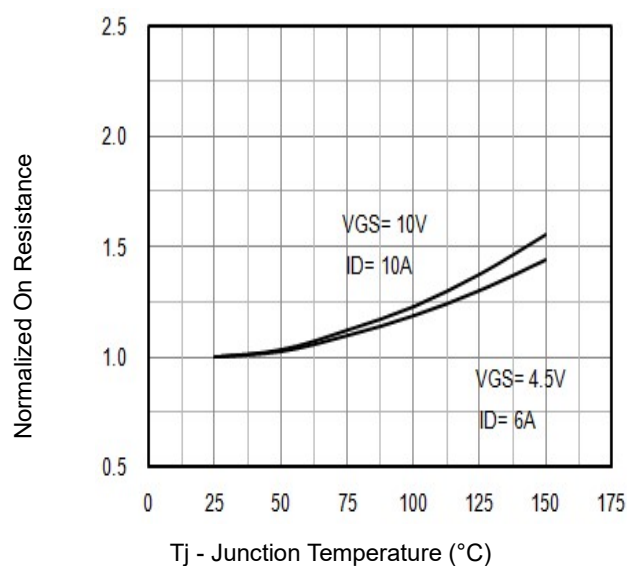


Fig4. Normalized On-Resistance Vs. T_J

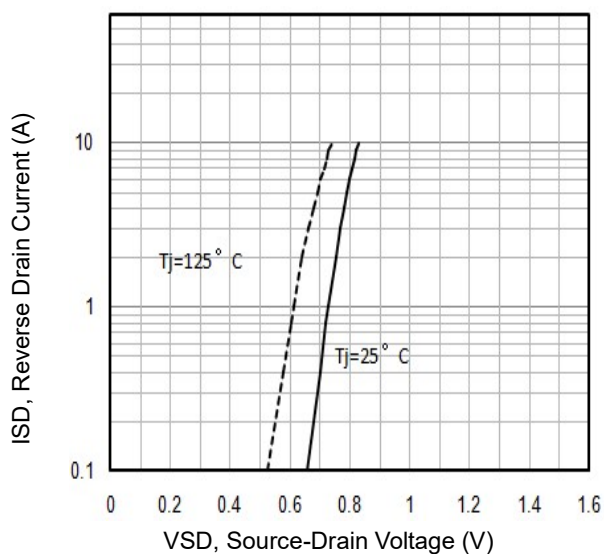


Fig5. Typical Source-Drain Diode Forward Voltage

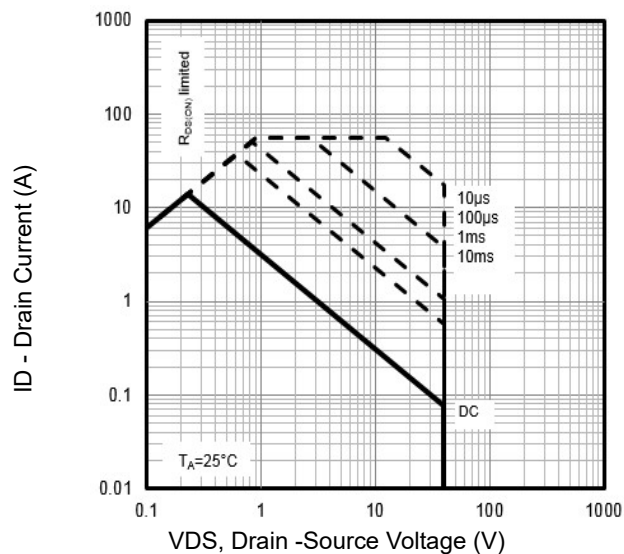


Fig6. Maximum Safe Operating Area

Typical Characteristics

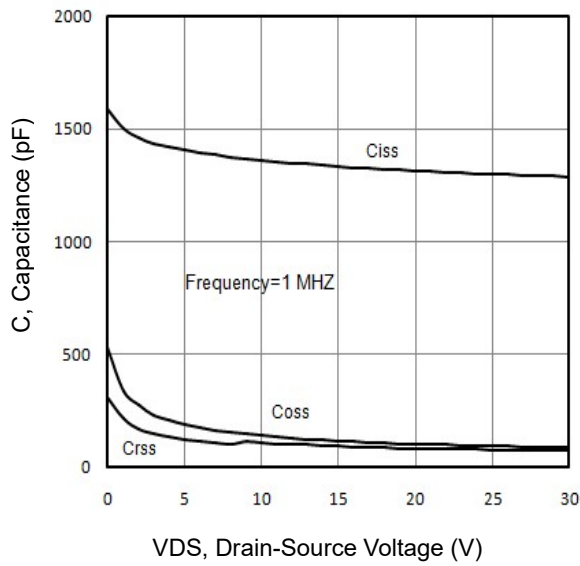


Fig7. Typical Capacitance Vs. Drain-Source Voltage

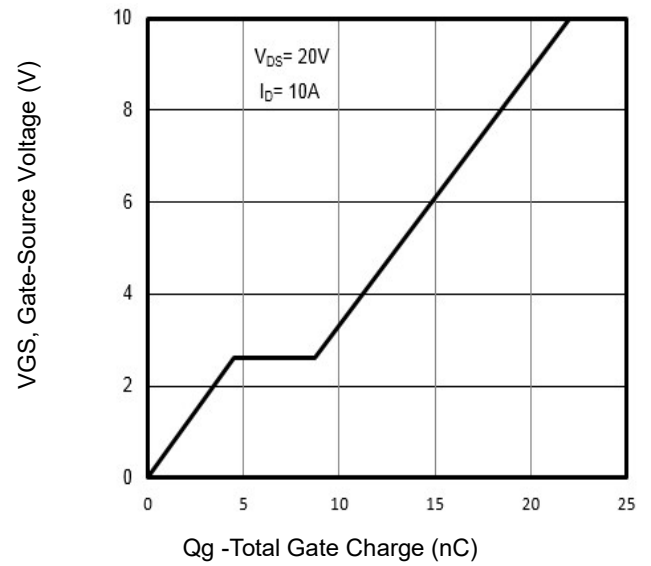


Fig8. Typical Gate Charge Vs. Gate-Source Voltage

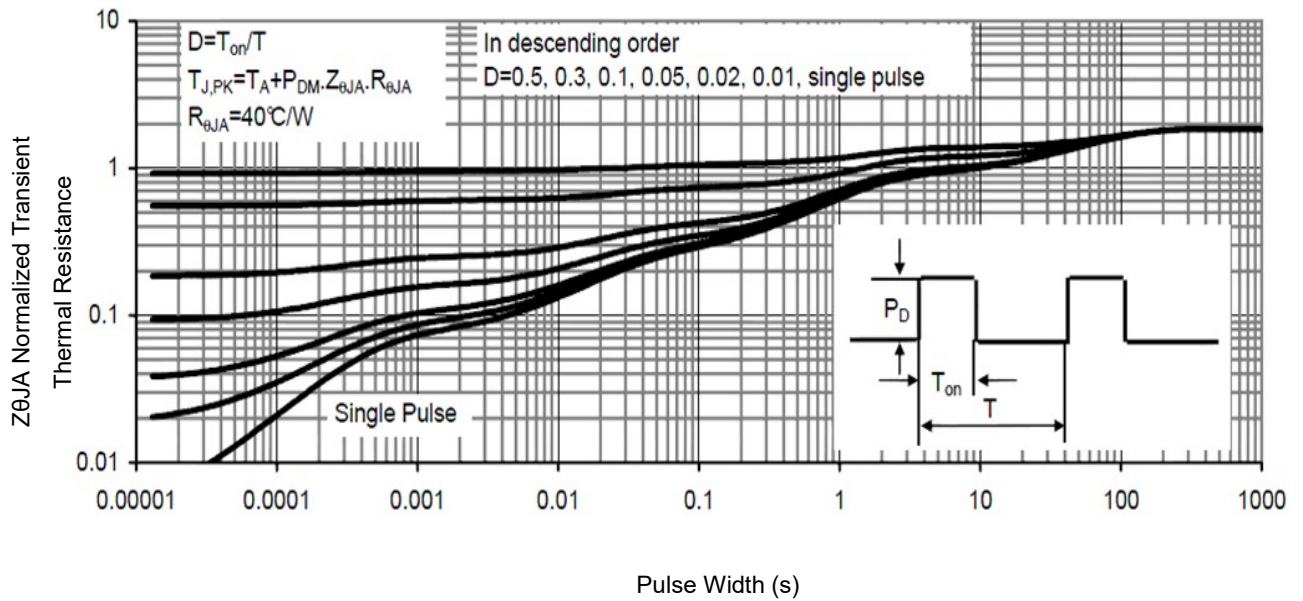


Fig9. Normalized Maximum Transient Thermal Impedance

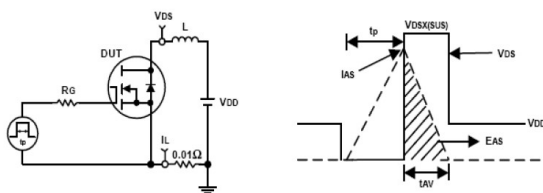


Fig10. Unclamped Inductive Test Circuit and waveforms

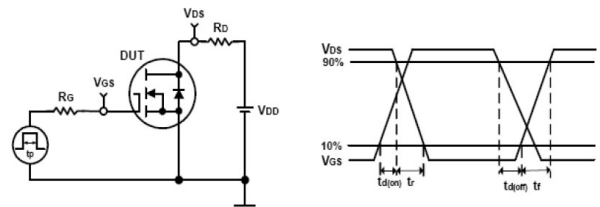


Fig11. Switching Time Test Circuit and waveforms