

N-Channel Enhancement Mode Power MOSFET

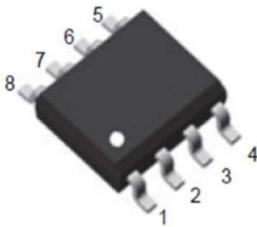
Features

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

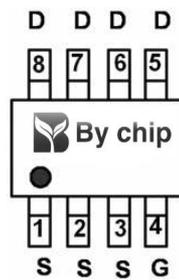
General Features

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

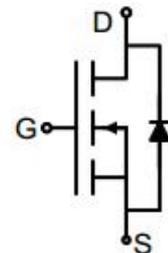
100% UIS TESTED!
 100% ΔV_{ds} TESTED!



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

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 @ $T_j=25^\circ\text{C}$ (unless otherwise stated)						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	40	--	--	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=40V, V_{GS}=0V$	--	--	1	μA
	Zero Gate Voltage Drain Current($T_j=125^\circ\text{C}$)	$V_{DS}=40V, V_{GS}=0V$	--	--	100	μA
I_{GSS}	Gate-Body Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	--	--	± 100	nA
$V_{GS(TH)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	1.0		3.0	V
$R_{DS(ON)}$	Drain-Source On-State Resistance ^②	$V_{GS}=10V, I_D=10A$	--		10	m Ω
$R_{DS(ON)}$	Drain-Source On-State Resistance ^②	$V_{GS}=4.5V, I_D=6A$	--		17	m Ω
Dynamic Electrical Characteristics @ $T_j = 25^\circ\text{C}$ (unless otherwise stated)						
C_{iss}	Input Capacitance	$V_{DS}=20V, V_{GS}=0V,$ $f=1\text{MHz}$	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	$f=1\text{MHz}$	--	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	$V_{DD}=20V,$ $I_D=10A,$ $R_G=3.0\Omega,$ $V_{GS}=10V$	--	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 @ $T_j = 25^\circ\text{C}$ (unless otherwise stated)						
V_{SD}	Forward on voltage	$I_{SD}=10A, V_{GS}=0V$	--	0.8	1.2	V
t_{rr}	Reverse Recovery Time	$T_j=25^\circ\text{C}, I_{SD}=10A,$ $V_{GS}=0V$ $di/dt=500A/\mu s$	--	8.5	--	ns
Q_{rr}	Reverse Recovery Charge		--	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

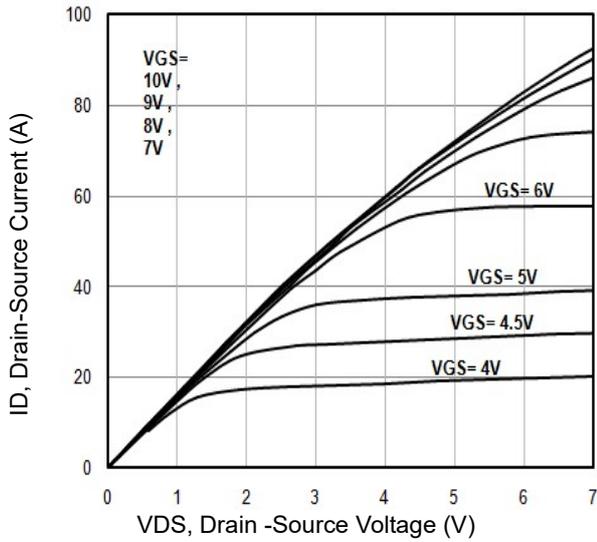


Fig1. Typical Output Characteristics

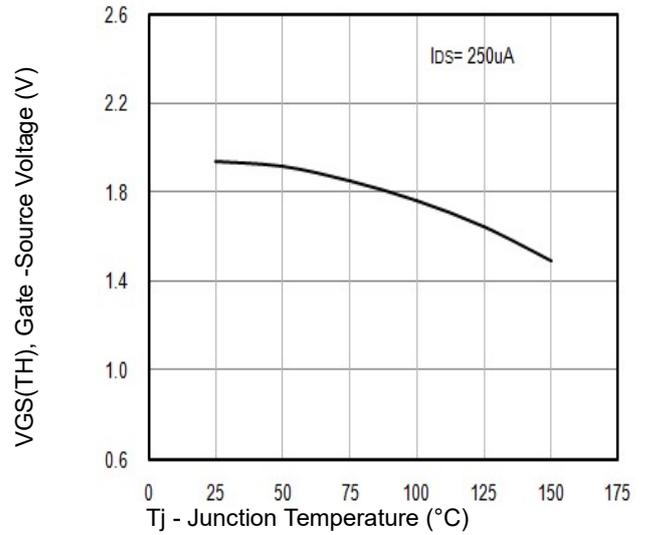


Fig2. $V_{GS(TH)}$ Gate -Source Voltage Vs. T_j

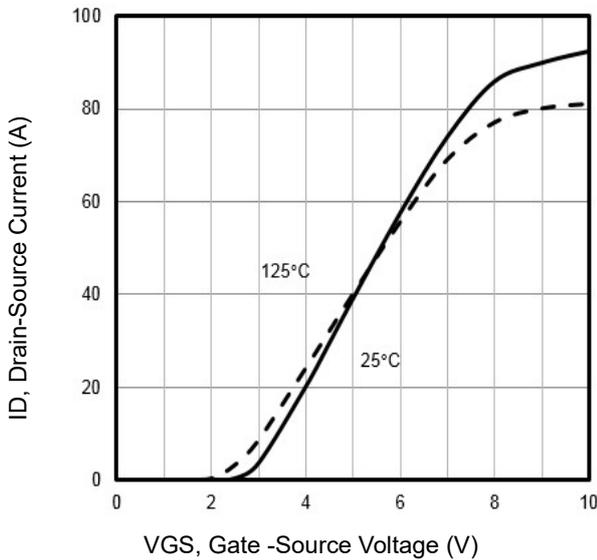


Fig3. Typical Transfer Characteristics

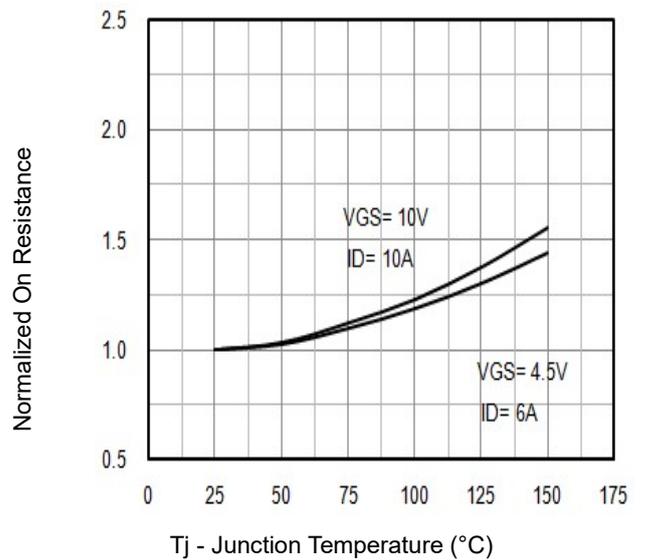


Fig4. Normalized On-Resistance Vs. T_j

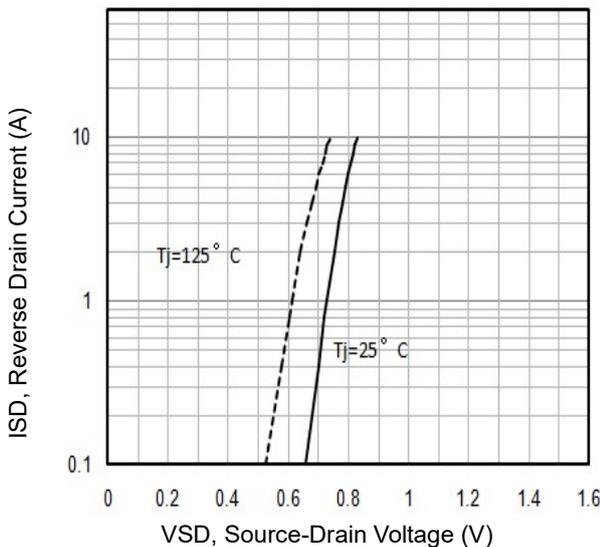


Fig5. Typical Source-Drain Diode Forward Voltage

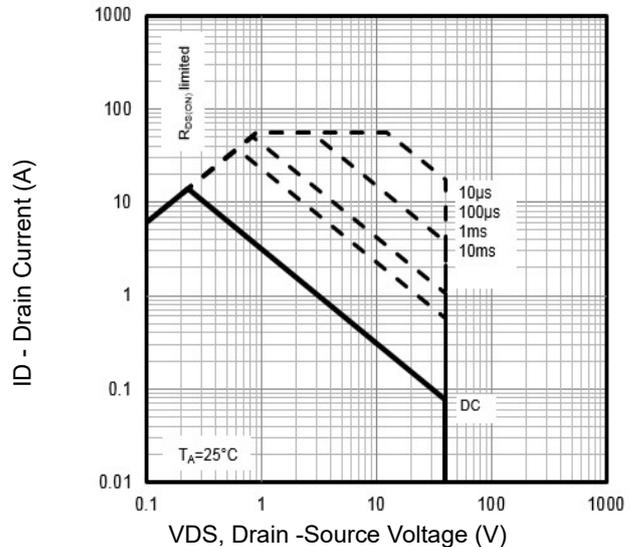


Fig6. Maximum Safe Operating Area

Typical Characteristics

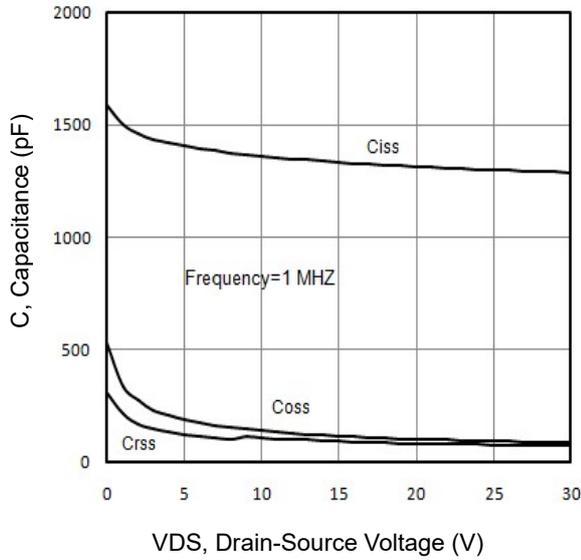


Fig7. Typical Capacitance Vs. Drain-Source Voltage

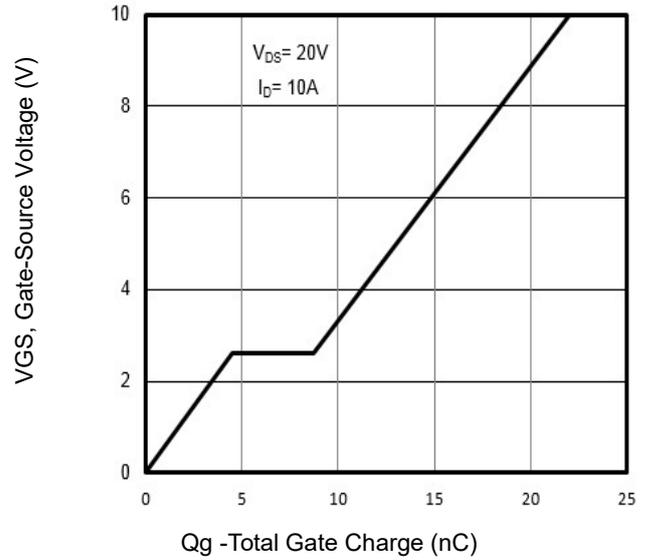


Fig8. Typical Gate Charge Vs. Gate-Source Voltage

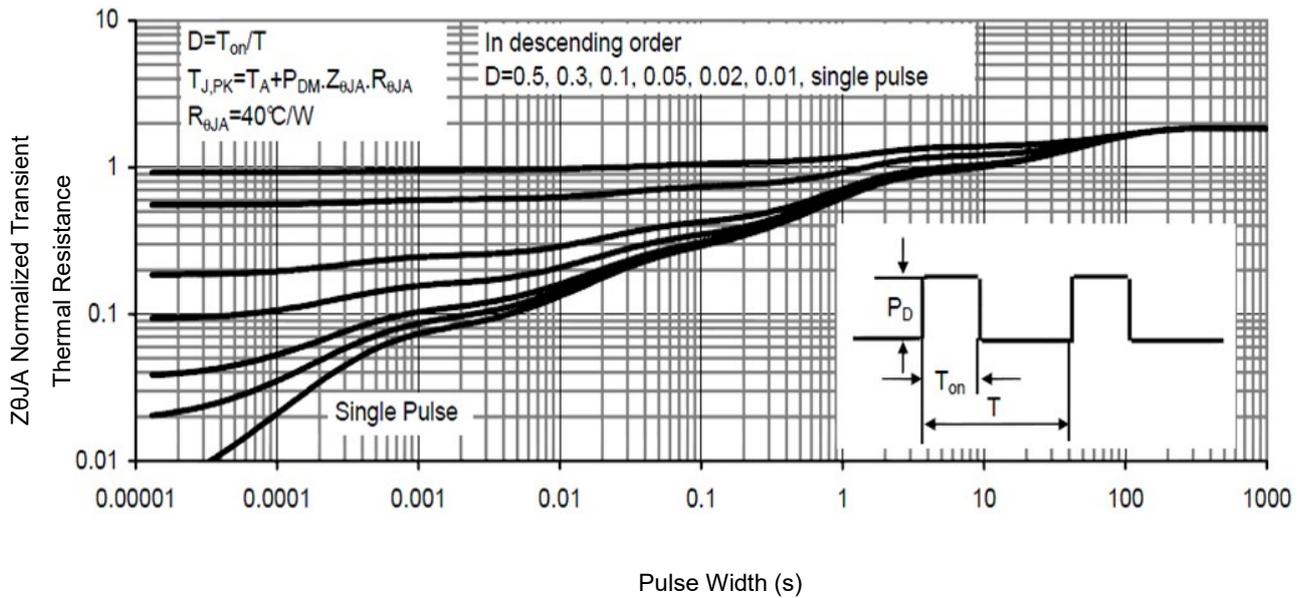


Fig9. Normalized Maximum Transient Thermal Impedance

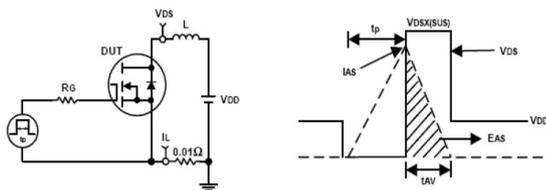


Fig10. Unclamped Inductive Test Circuit and waveforms

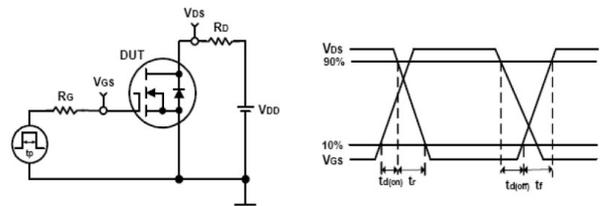


Fig11. Switching Time Test Circuit and waveforms