1. Features
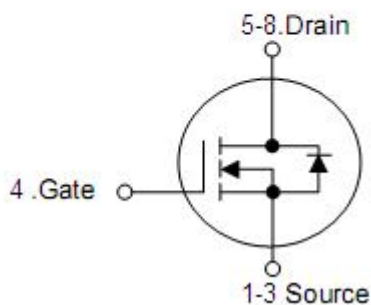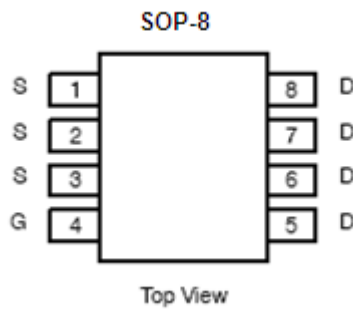
- $R_{DS(ON)}$=20mΩ@V_{GS}=10V
- N-Channel, Logic level 5V
- Enhancement mode
- Very low on-resistance $R_{DS(ON}$ @V_{GS}=4.5V
- Fast Switching
- Pb-free lead plating; RoHS compliant

2.Symbol

SOP-8

S	1		8	D
S	2		7	D
S	3		6	D
G	4		5	D

Top View

5-8.Drain

4 .Gate

1-3 Source

Pin	Function
1	Source
2	Source
3	Source
4	Gate
5	Drain
6	Drain
7	Drain
8	Drain

3. Maximum ratings，at T_J=25℃，unless otherwise specified

Parameter		Symbol	Rating	Units
Drain-source breakdown voltage		V_{DSS}	100	V
Gate-source voltage T_C=25°C		V_{GS}	±20	V
Diode continuous forward current		I_S	9	A
Continuous drain current , V_{GS}@10V	T_C=25°C	I_D	9	A
	T_A=100°C		5.8	
Pulsed drain current tested[1] T_C=25°C		I_{DM}	36	
Maximum power dissipation T_A=25°C		P_D	2	W
Avalanche engergy , single pulsed[2] L=0.3mH		E_{AS}	15	mJ
Storage and operating temperature range		T_{STG} T_J	-55 to175	ºC

4. Thermal characteristics

Parameter	Symbol	Typ	Max	Unit
Thermal resistance junction-case	$R_{\theta JC}$	-	35	ºC/W
Thermal resistance junction-ambient	$R_{\theta JA}$	-	62.5	

5. Electrical characteristics

$(T_C=25°C$,unless otherwise noted)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
Drain-source breakdown voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	100	-	-	V
Drain-source on-resistance[3]	$R_{DS(on)}$	$V_{GS}=10V, I_D=9A$	-	20	25	mΩ
		$V_{GS}=4.5V, I_D=5A$	-	22	28	
Gate threshold voltage	$V_{GS(TH)}$	$V_{DS}=V_{GS}, I_D=250uA$	1.0	1.5	2.2	V
Zero gate voltage Drain Current	I_{DSS}	$V_{DS}=100V, V_{GS}=0V$ $T_C=25°C$	-	-	1	μA
		$V_{DS}=100V, V_{GS}=0V$ $T_C=125°C$	-	-	100	
Gate-source forward leakage	I_{GSS}	$V_{GS}=\pm20V, V_{DS}=0V$	-	-	±100	nA
Total gate charge	Q_g	$V_{DS}=50V, I_D=8A$ $V_{GS}=10V$	-	23	-	nC
Gate-source charge	Q_{gs}		-	6.5	-	
Gate-drain charge	Q_{gd}		-	4.5	-	
Turn-on delay time	$t_{d(on)}$	$V_{DD}=50V, I_D=8A,$ $R_G=6.8Ω, V_{GS}=10V$	-	8	-	ns
Rise time	t_r		-	5	-	
Turn-off delay time	$t_{d(off)}$		-	26	-	
Fall time	t_f		-	4	-	
Input capacitance	C_{iss}	$V_{DS}=24V, V_{GS}=0V$ $f=1MHz$	-	1880	-	pF
Output capacitance	C_{oss}		-	145	-	
Reverse transfer capacitance	C_{rss}		-	95	-	
Diode forward voltage	V_{SD}	$I_{SD}=2A, V_{GS}=0V$	-	0.71	1.2	V
Reverse recovery time	t_{rr}	$I_{SD}=10A, V_{GS}=0V$ $dI/dt=100A/\mu s$ $T_J=25°C$	-	24	-	ns
Reverse recovery charge	Q_{rr}		-	50	-	nC

Note:

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

2. Limited by T_{JMAX},starting $T_J=25$ ℃,L=0.3mH,$R_G=25Ω, I_{AS}=10A, V_{GS}=10V$,Part not recommended for use above this value.

3. Pulse width ≤300us;duty cycle ≤2%

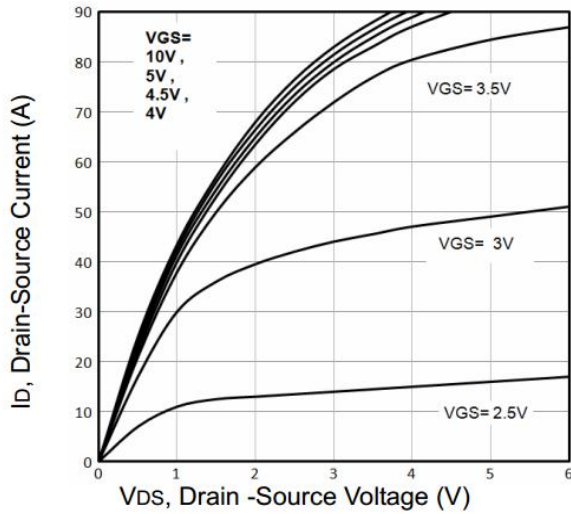## 6. Typical operating characteristics

Fig1. Typical Output Characteristics
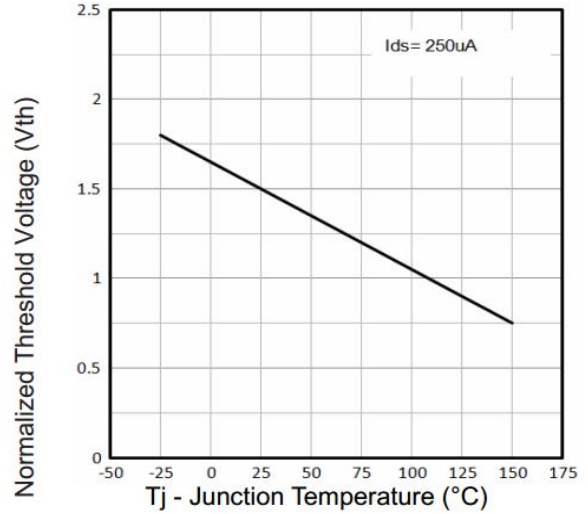

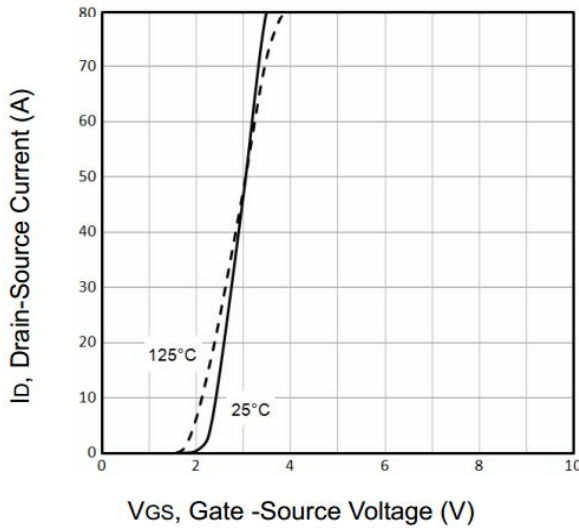**Fig2.** Normalized Threshold Voltage Vs. Temperature

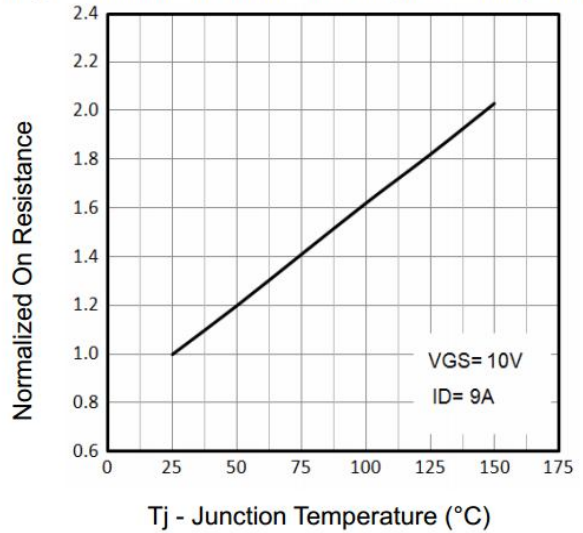**Fig3.** Typical Transfer Characteristics

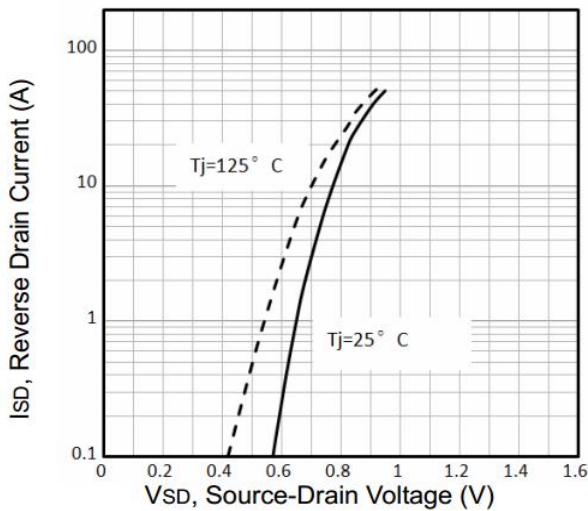**Fig4.** Normalized On-Resistance Vs. Temperature

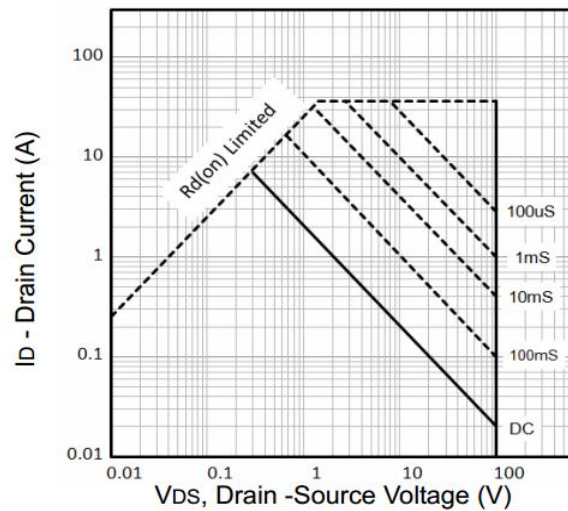**Fig5.** Typical Source-Drain Diode Forward Voltage
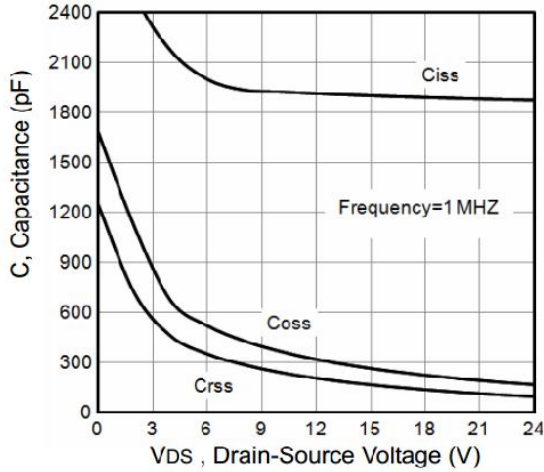

Fig6. Maximum Safe Operating Area
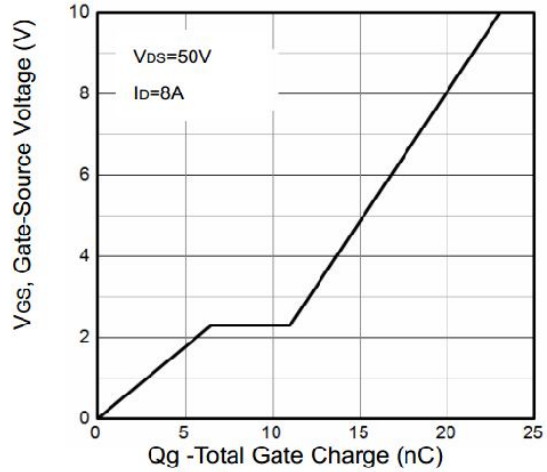
Fig7. Typical Capacitance Vs.Drain-Source Voltage

Fig8. Typical Gate Charge Vs.Gate-Source
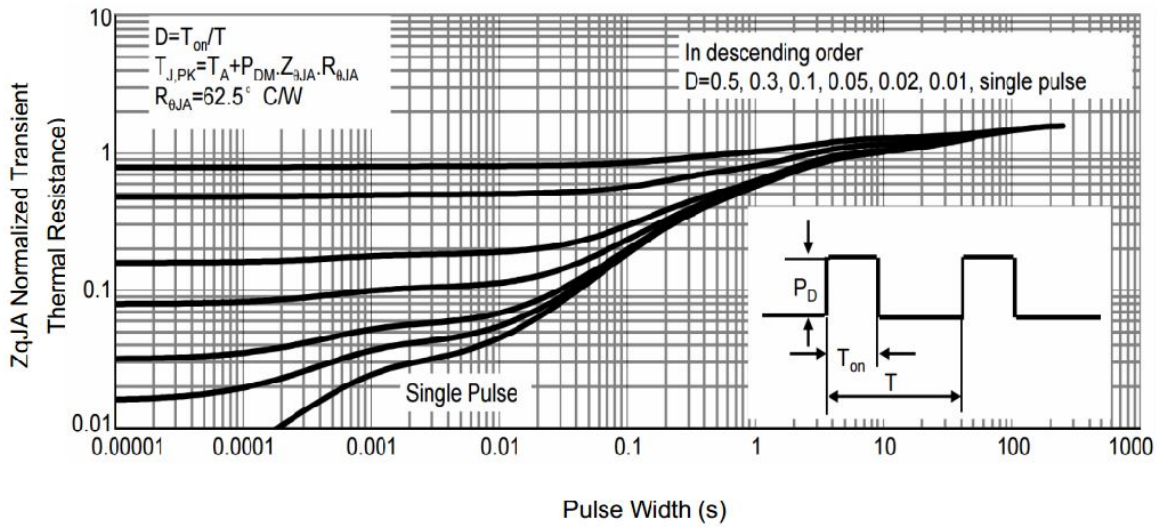

Pulse Width (s)

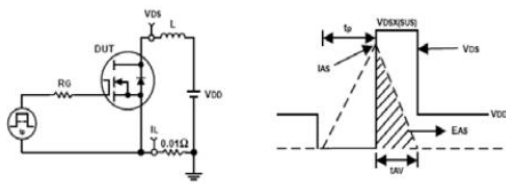Fig9. Normalized Maximum Transient Thermal Impedance
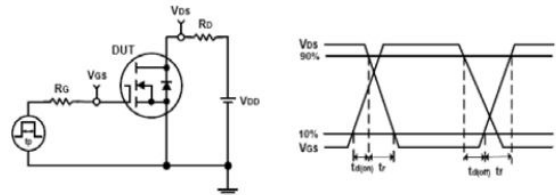

Fig10. Unclamped Inductive Test Circuit and waveforms

Fig11. Switching Time Test Circuit and waveforms