

## Dual N-channel Enhancement Mode Power MOSFET

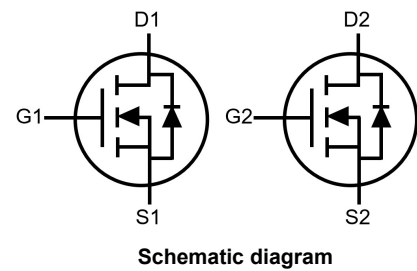
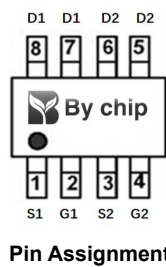
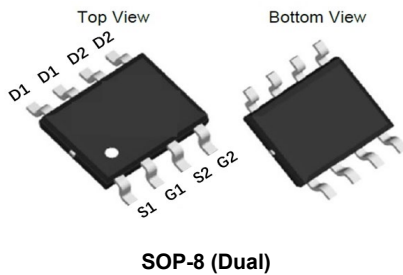
### Features

- $V_{DS} = 30V$ ,  $I_D = 9A$   
 $R_{DS(ON)} < 16\text{ m}\Omega$  @  $V_{GS} = 10V$   
 $R_{DS(ON)} < 24\text{ m}\Omega$  @  $V_{GS} = 4.5V$

### General Features

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

100% UIS TESTED!  
 100%  $\Delta V_{ds}$  TESTED!



### Maximum ratings, at $T_J = 25^\circ\text{C}$ , unless otherwise specified

Symbol	Parameter	Rating	Unit
$V_{(BR)DSS}$	Drain-Source breakdown voltage	30	V
$I_S$	Diode continuous forward current	$T_A = 25^\circ\text{C}$ 2.3	A
$I_D$	Continuous drain current @ $V_{GS} = 10V$	$T_A = 25^\circ\text{C}$ 9	A
		$T_A = 100^\circ\text{C}$ 5.7	A
$I_{DM}$	Pulse drain current tested ①	$T_A = 25^\circ\text{C}$ 36	A
EAS	Avalanche energy, single pulsed ②	9	mJ
$P_D$	Maximum power dissipation	$T_A = 25^\circ\text{C}$ 2	W
$V_{GS}$	Gate-Source voltage	$\pm 20$	V
MSL		Level 3	
$T_{STG}$ $T_J$	Storage and operating temperature range	-55 to 150	$^\circ\text{C}$

### Thermal Characteristics

Symbol	Parameter	Typical	Unit
$R_{\theta JL}$	Thermal Resistance-Junction to Lead	40	$^\circ\text{C/W}$
$R_{\theta JA}$	Thermal Resistance-Junction to Ambient	62.5	$^\circ\text{C/W}$

**Electrical Characteristics**

Symbol	Parameter	Condition	Min.	Typ.	Max.	Unit
<b>Static Electrical Characteristics @ T<sub>J</sub> = 25°C (unless otherwise stated)</b>						
V <sub>(BR)DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>D</sub> =250μA	30	--	--	V
I <sub>DSS</sub>	Zero Gate Voltage Drain Current(Tc=25°C)	V <sub>DS</sub> =30V, V <sub>GS</sub> =0V	--	--	1	μA
	Zero Gate Voltage Drain Current(Tc=125°C)	V <sub>DS</sub> =30V, V <sub>GS</sub> =0V	--	--	100	μA
I <sub>GSS</sub>	Gate-Body Leakage Current	V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V	--	--	±100	nA
V <sub>GS(TH)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	1		2.5	V
R <sub>DS(ON)</sub>	Drain-Source On-State Resistance ②	V <sub>GS</sub> =10V, I <sub>D</sub> =8A	--		16	mΩ
R <sub>DS(ON)</sub>	Drain-Source On-State Resistance ②	V <sub>GS</sub> =4.5V, I <sub>D</sub> =4A	--		24	mΩ
<b>Dynamic Electrical Characteristics @ T<sub>J</sub> = 25°C (unless otherwise stated)</b>						
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> =15V, V <sub>GS</sub> =0V, f=1MHz	--	455	--	pF
C <sub>oss</sub>	Output Capacitance		--	75	--	pF
C <sub>rss</sub>	Reverse Transfer Capacitance		--	60	--	pF
R <sub>g</sub>	Gate Resistance	f=1MHz	--	3.3	--	Ω
Q <sub>g</sub>	Total Gate Charge	V <sub>DS</sub> =15V, I <sub>D</sub> =8A, V <sub>GS</sub> =10V	--	11	--	nC
Q <sub>gs</sub>	Gate-Source Charge		--	3	--	nC
Q <sub>gd</sub>	Gate-Drain Charge		--	4	--	nC
<b>Switching Characteristics</b>						
t <sub>d(on)</sub>	Turn-on Delay Time	V <sub>DD</sub> =15V, I <sub>D</sub> =8A, R <sub>G</sub> =3Ω, V <sub>GS</sub> =10V	--	7	--	ns
t <sub>r</sub>	Turn-on Rise Time		--	10	--	ns
t <sub>d(off)</sub>	Turn-Off Delay Time		--	22	--	ns
t <sub>f</sub>	Turn-Off Fall Time		--	7	--	ns
<b>Source- Drain Diode Characteristics @ T<sub>J</sub> = 25°C (unless otherwise stated)</b>						
V <sub>SD</sub>	Forward on voltage	I <sub>SD</sub> =8A, V <sub>GS</sub> =0V	--	0.9	1.2	V
t <sub>rr</sub>	Reverse Recovery Time	T <sub>J</sub> =25°C, I <sub>sd</sub> =8A, V <sub>GS</sub> =0V	--	9.5	--	ns
Q <sub>rr</sub>	Reverse Recovery Charge	di/dt=500A/μs	--	11.8	--	nC

**NOTE:**

- ① Repetitive rating; pulse width limited by max. junction temperature.
- ② Limited by T<sub>Jmax</sub>, starting T<sub>J</sub> = 25°C, L = 0.5mH, R<sub>G</sub> = 25Ω, I<sub>AS</sub> = 6A, V<sub>GS</sub> = 10V. Part not recommended for use above this value
- ③ Pulse width ≤ 300μs; duty cycle ≤ 2%.

Typical Characteristics

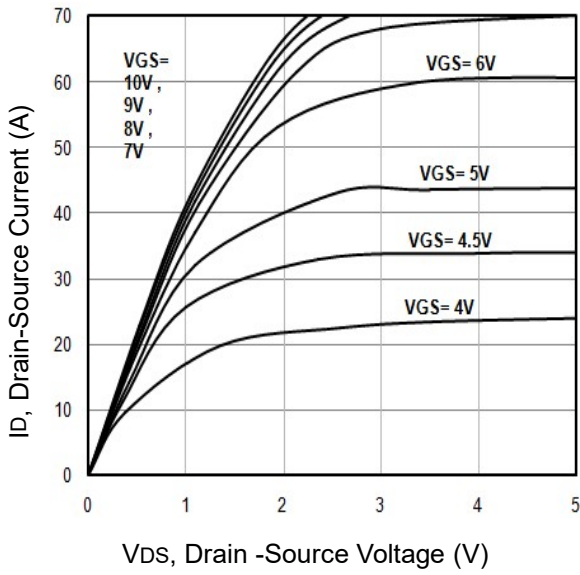


Fig1. Typical Output Characteristics

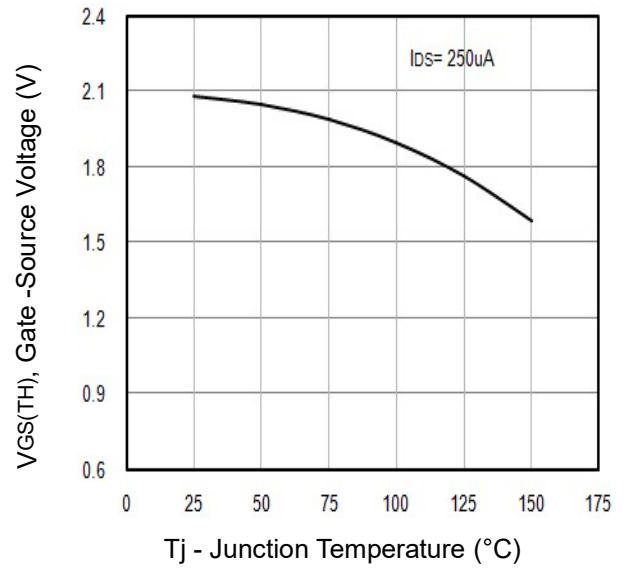


Fig2. Threshold Voltage Vs. Temperature

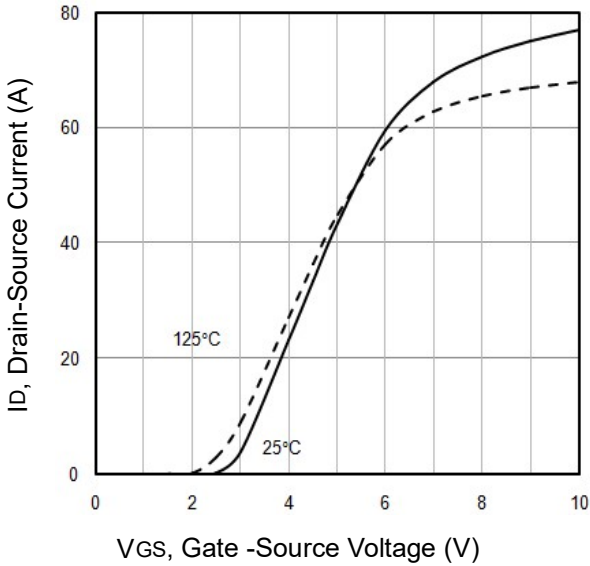


Fig3. Typical Transfer Characteristics

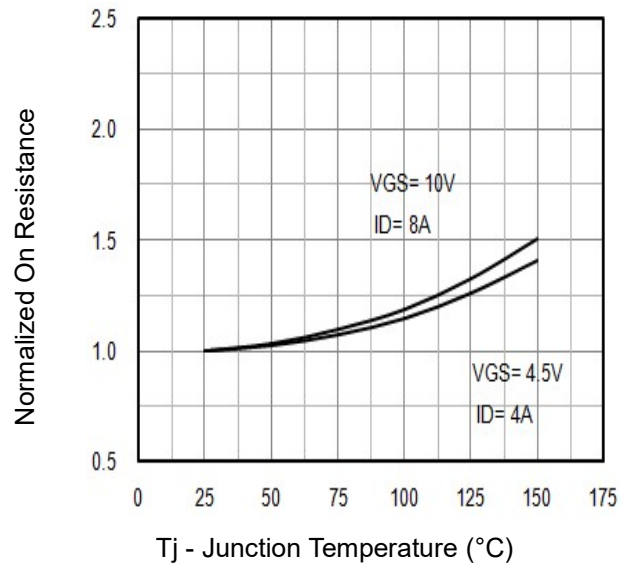


Fig4. Normalized On-Resistance Vs. Temperature

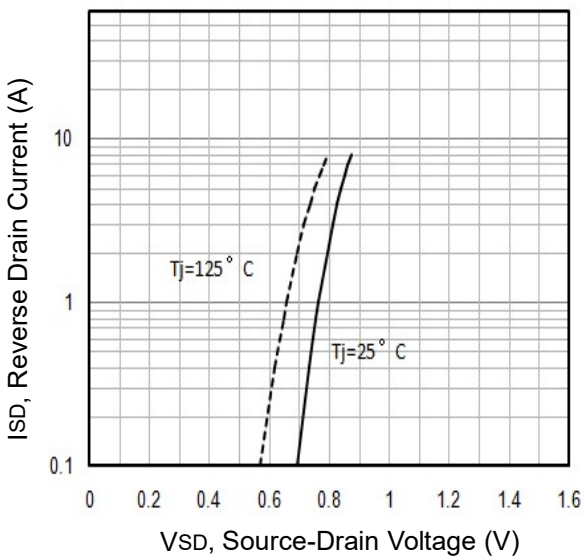


Fig5. Typical Source-Drain Diode Forward Voltage

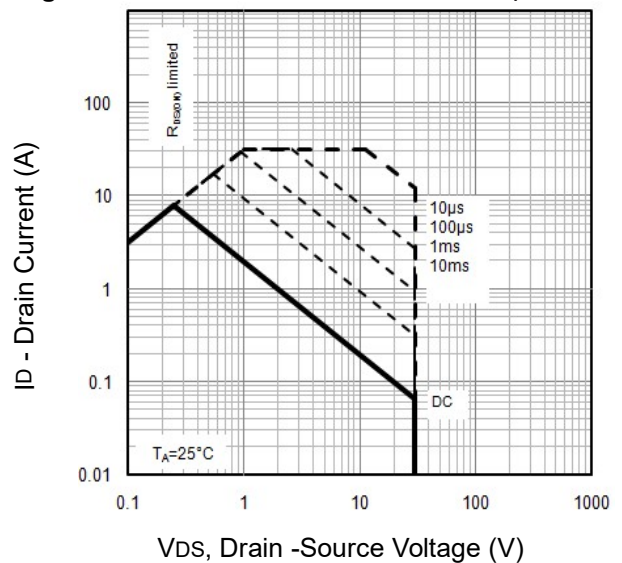


Fig6. Maximum Safe Operating Area

Typical Characteristics

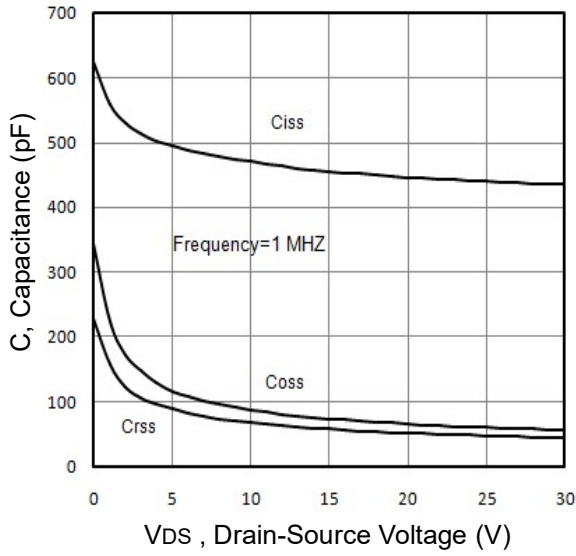


Fig7. Typical Capacitance Vs.Drain-Source Voltage

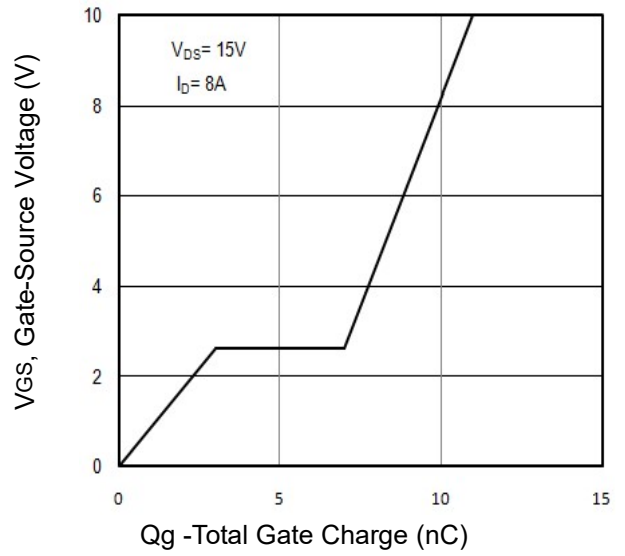
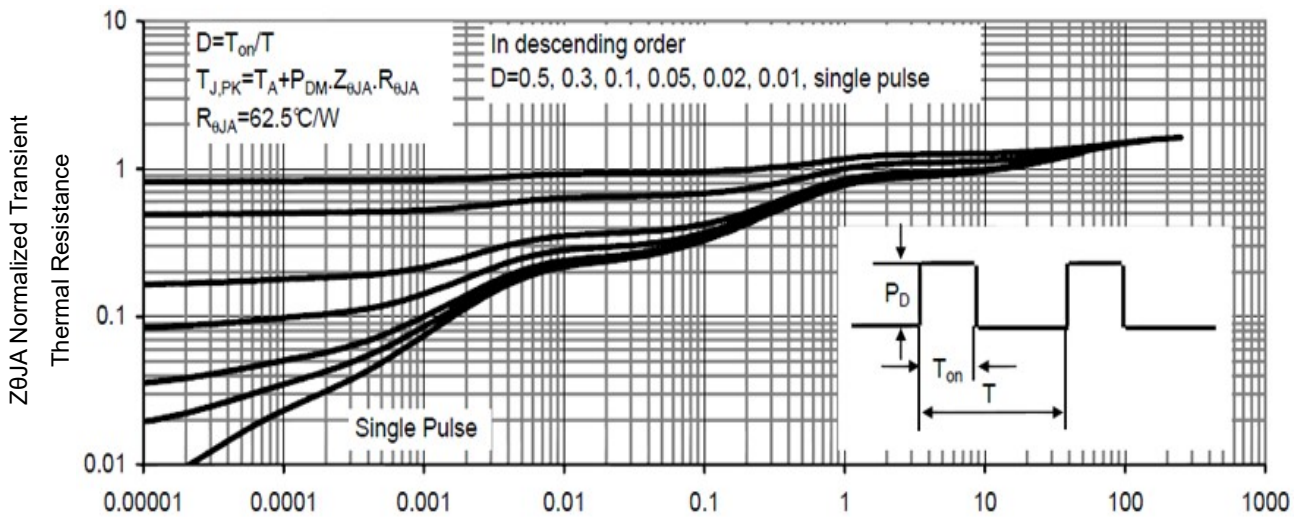


Fig8. Typical Gate Charge Vs.Gate-Source Voltage



T1, Square Wave Pulse Duration(sec)

Fig9. T1, Transient Thermal Response Curve

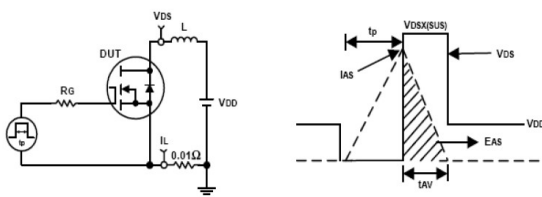


Fig10. Unclamped Inductive Test Circuit and waveforms

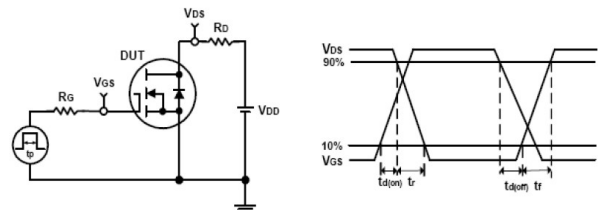


Fig11. Switching Time Test Circuit and waveforms