

Dual N-channel Enhancement Mode Power MOSFET

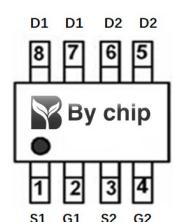
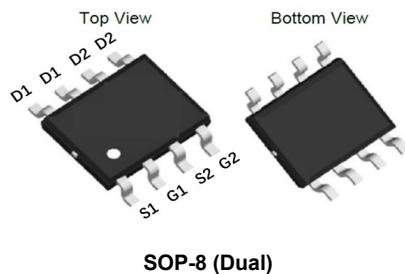
Features

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

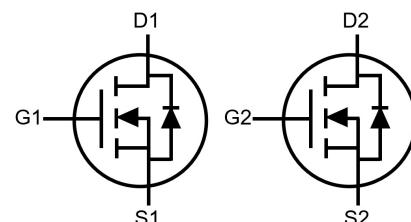
General Features

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

100% UIS TESTED!
100% ΔV_{ds} TESTED!



Pin Assignment



Schematic diagram

Maximum ratings, at $T_j=25^\circ C$, unless otherwise specified

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

Thermal Characteristics

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

Electrical Characteristics

Symbol	Parameter	Condition	Min.	Typ.	Max.	Unit
Static Electrical Characteristics @ $T_J = 25^\circ\text{C}$ (unless otherwise stated)						
$V_{(\text{BR})\text{DSS}}$	Drain-Source Breakdown Voltage	$V_{\text{GS}}=0\text{V}, I_{\text{D}}=250\mu\text{A}$	30	--	--	V
I_{DSS}	Zero Gate Voltage Drain Current($T_c=25^\circ\text{C}$)	$V_{\text{DS}}=30\text{V}, V_{\text{GS}}=0\text{V}$	--	--	1	μA
	Zero Gate Voltage Drain Current($T_c=125^\circ\text{C}$)	$V_{\text{DS}}=30\text{V}, V_{\text{GS}}=0\text{V}$	--	--	100	μA
I_{GSS}	Gate-Body Leakage Current	$V_{\text{GS}}=\pm 20\text{V}, V_{\text{DS}}=0\text{V}$	--	--	± 100	nA
$V_{\text{GS}(\text{TH})}$	Gate Threshold Voltage	$V_{\text{DS}}=V_{\text{GS}}, I_{\text{D}}=250\mu\text{A}$	1		2.5	V
$R_{\text{DS}(\text{ON})}$	Drain-Source On-State Resistance ②	$V_{\text{GS}}=10\text{V}, I_{\text{D}}=8\text{A}$	--		16	$\text{m}\Omega$
$R_{\text{DS}(\text{ON})}$	Drain-Source On-State Resistance ②	$V_{\text{GS}}=4.5\text{V}, I_{\text{D}}=4\text{A}$	--		24	$\text{m}\Omega$
Dynamic Electrical Characteristics @ $T_J = 25^\circ\text{C}$ (unless otherwise stated)						
C_{iss}	Input Capacitance	$V_{\text{DS}}=15\text{V}, V_{\text{GS}}=0\text{V}, f=1\text{MHz}$	--	455	--	pF
C_{oss}	Output Capacitance		--	75	--	pF
C_{rss}	Reverse Transfer Capacitance		--	60	--	pF
R_g	Gate Resistance	f=1MHz	--	3.3	--	Ω
Q_g	Total Gate Charge	$V_{\text{DS}}=15\text{V}, I_{\text{D}}=8\text{A}, V_{\text{GS}}=10\text{V}$	--	11	--	nC
Q_{gs}	Gate-Source Charge		--	3	--	nC
Q_{gd}	Gate-Drain Charge		--	4	--	nC
Switching Characteristics						
$t_{\text{d}(\text{on})}$	Turn-on Delay Time	$V_{\text{DD}}=15\text{V}, I_{\text{D}}=8\text{A}, R_{\text{G}}=3\Omega, V_{\text{GS}}=10\text{V}$	--	7	--	ns
t_r	Turn-on Rise Time		--	10	--	ns
$t_{\text{d}(\text{off})}$	Turn-Off Delay Time		--	22	--	ns
t_f	Turn-Off Fall Time		--	7	--	ns
Source- Drain Diode Characteristics@ $T_J = 25^\circ\text{C}$ (unless otherwise stated)						
V_{SD}	Forward on voltage	$I_{\text{SD}}=8\text{A}, V_{\text{GS}}=0\text{V}$	--	0.9	1.2	V
t_{rr}	Reverse Recovery Time	$T_J=25^\circ\text{C}, I_{\text{SD}}=8\text{A}, V_{\text{GS}}=0\text{V}$ $dI/dt=500\text{A}/\mu\text{s}$	--	9.5	--	ns
Q_{rr}	Reverse Recovery Charge		--	11.8	--	nC

NOTE:

- ① Repetitive rating; pulse width limited by max. junction temperature.
- ② Limited by $T_{J\text{max}}$, starting $T_J = 25^\circ\text{C}$, $L = 0.5\text{mH}$, $R_G = 25\Omega$, $I_{AS} = 6\text{A}$, $V_{GS} = 10\text{V}$. Part not recommended for use above this value
- ③ Pulse width $\leq 300\mu\text{s}$; duty cycle $\leq 2\%$.

Typical Characteristics

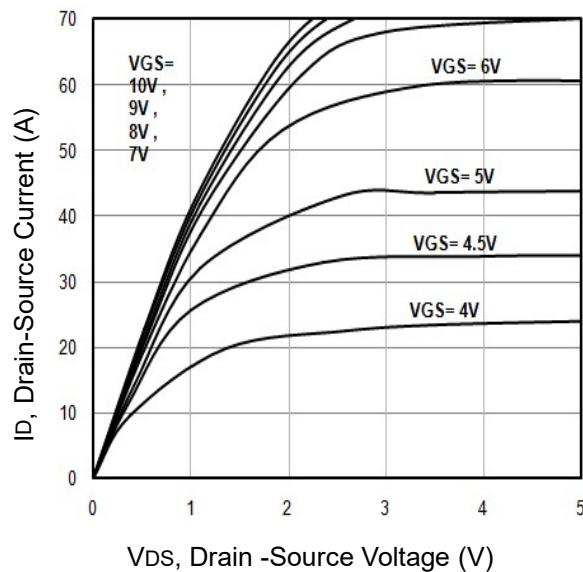


Fig1. Typical Output Characteristics

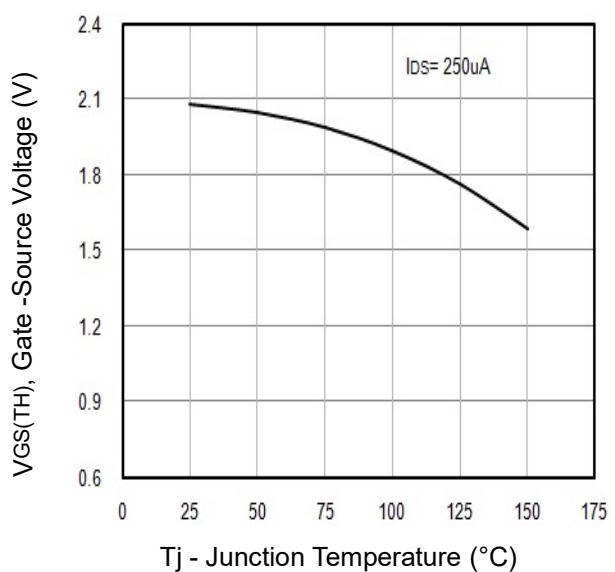


Fig2. Threshold Voltage Vs. Temperature

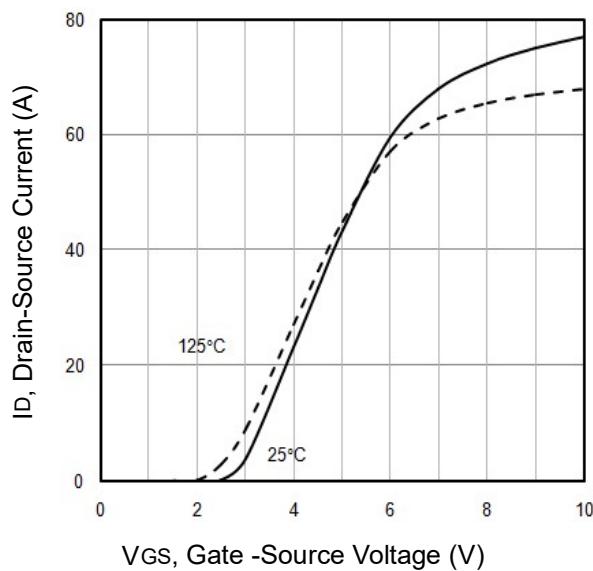


Fig3. Typical Transfer Characteristics

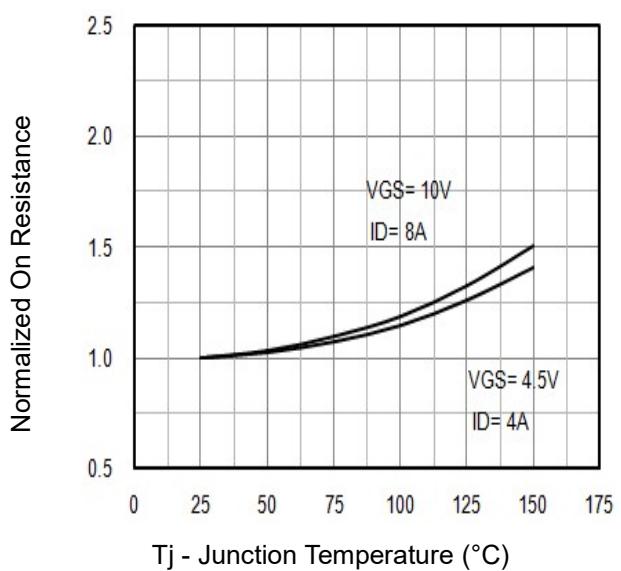


Fig4. Normalized On-Resistance Vs. Temperature

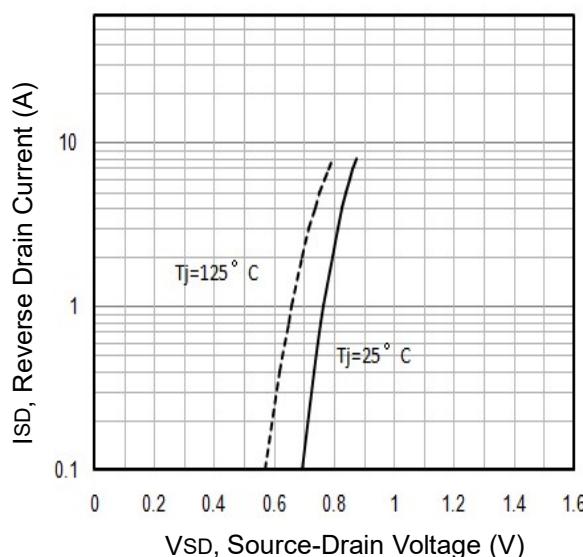


Fig5. Typical Source-Drain Diode Forward Voltage

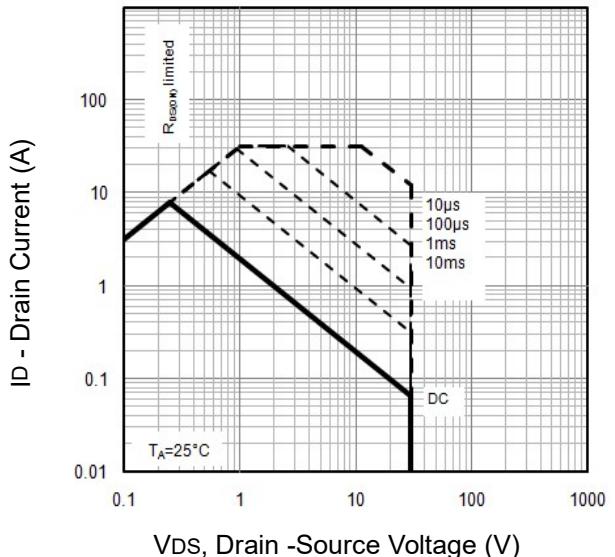


Fig6. Maximum Safe Operating Area

Typical Characteristics

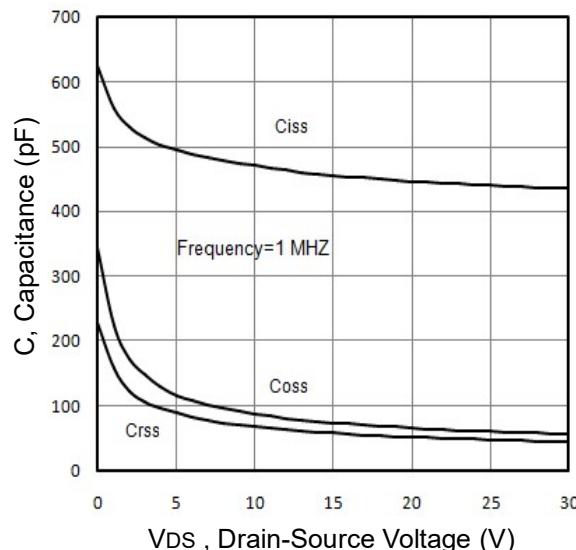


Fig7. Typical Capacitance Vs.Drain-Source Voltage

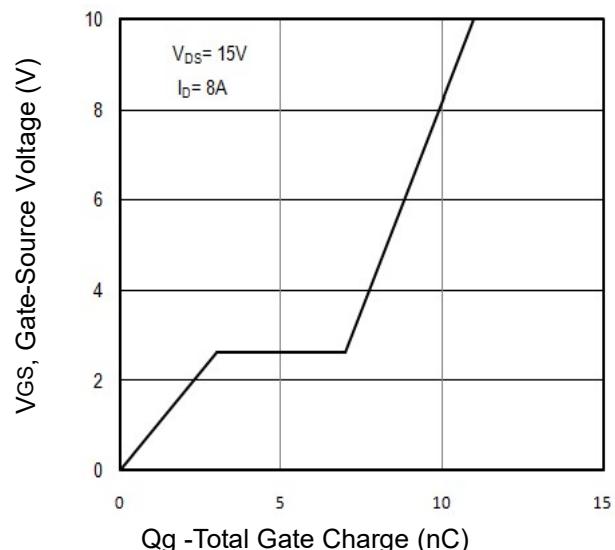
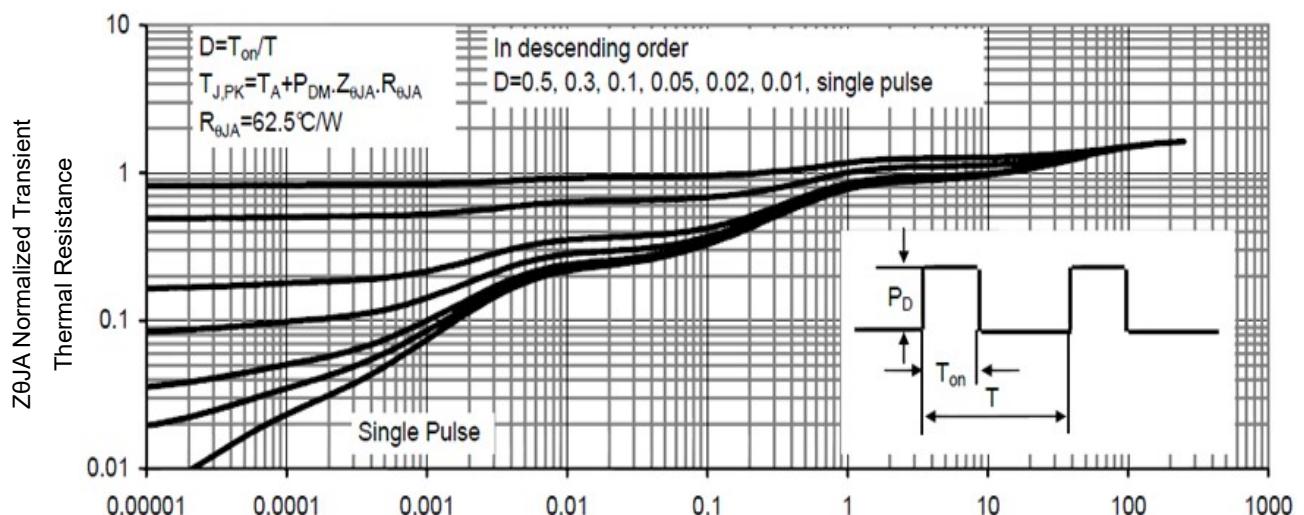


Fig8. Typical Gate Charge Vs.Gate-Source Voltage



T1, Square Wave Pulse Duration(sec)

Fig9. T1 ,Transient Thermal Response Curve

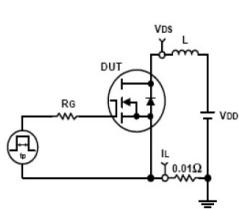


Fig10. Unclamped Inductive Test Circuit and waveforms

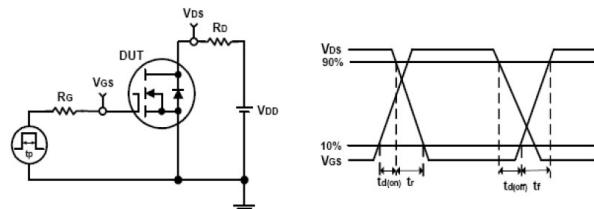


Fig11. Switching Time Test Circuit and waveforms