

N-Channel Enhancement Mode Power MOSFET

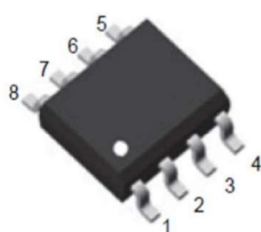
Features

- $V_{DS} = 20V$, $I_D = 10A$
 $R_{DS(ON)} < 11\text{ m}\Omega$ @ $V_{GS} = 4.5V$
 $R_{DS(ON)} < 14\text{ m}\Omega$ @ $V_{GS} = 2.5V$

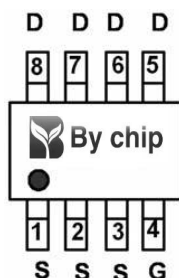
General Features

- 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

■ Absolute Maximum Ratings ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Parameter		Symbol	Limit	Unit
Drain-source Voltage		V_{DS}	20	V
Gate-source Voltage		V_{GS}	± 10	V
Drain Current	$T_A = 25^\circ\text{C}$	I_D	10	A
	$T_A = 70^\circ\text{C}$		8	
Pulsed Drain Current ^A		I_{DM}	45	A
Total Power Dissipation	$T_A = 25^\circ\text{C}$	P_D	1.9	W
	$T_A = 70^\circ\text{C}$		1.2	W
Thermal Resistance Junction-to-Ambient ^B		$R_{\theta JA}$	66	$^\circ\text{C/W}$
Junction and Storage Temperature Range		T_J, T_{STG}	$-55 \sim +150$	$^\circ\text{C}$

■ Electrical Characteristics (T_J=25°C unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Static Parameter						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _D =250μA	20			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =20V, V _{GS} =0V			1	μA
Gate-Body Leakage Current	I _{GSS}	V _{GS} =±10V, V _{DS} =0V			±100	nA
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D =250μA	0.5		2.0	V
Static Drain-Source On-Resistance	R _{DS(ON)}	V _{GS} =4.5V, I _D =10A			11	mΩ
		V _{GS} =2.5V, I _D =4A			14	
		V _{GS} =1.8V, I _D =2A			18.2	
Diode Forward Voltage	V _{SD}	I _S =10A, V _{GS} =0V			1.2	V
Dynamic Parameters						
Input Capacitance	C _{iss}	V _{DS} =10V, V _{GS} =0V, f=1MHZ		888		pF
Output Capacitance	C _{oss}			133		
Reverse Transfer Capacitance	C _{rss}			117		
Switching Parameters						
Total Gate Charge	Q _g	V _{GS} =4.5V, V _{DS} =10V, I _D =6.8A		11.05		nC
Gate-Source Charge	Q _{gs}			1.73		
Gate-Drain Charge	Q _{gd}			3.1		
Turn-on Delay Time	t _{D(on)}	V _{GS} =4.5V, V _{DS} =10V, I _D =6.8A R _{GEN} =3Ω		7		ns
Turn-on Rise Time	t _r			46		
Turn-off Delay Time	t _{D(off)}			30		
Turn-off fall Time	t _f			52		

A. Pulse Test: Pulse Width≤300us, Duty cycle ≤2%.

B. R_{θJA} is the sum of the junction-to-case and case-to-ambient thermal resistance, where the case thermal reference is defined as the solder mounting surface of the drain pins. R_{θJC} is guaranteed by design, while R_{θJA} is determined by the board design. The maximum rating presented here is based on mounting on a 1 in 2 pad of 2oz copper.

■ Typical Performance Characteristics



Figure1. Output Characteristics



Figure2. Transfer Characteristics



Figure 3: On-Resistance vs. Drain Current and Gate Voltage



Figure 4: On-Resistance vs. Junction Temperature

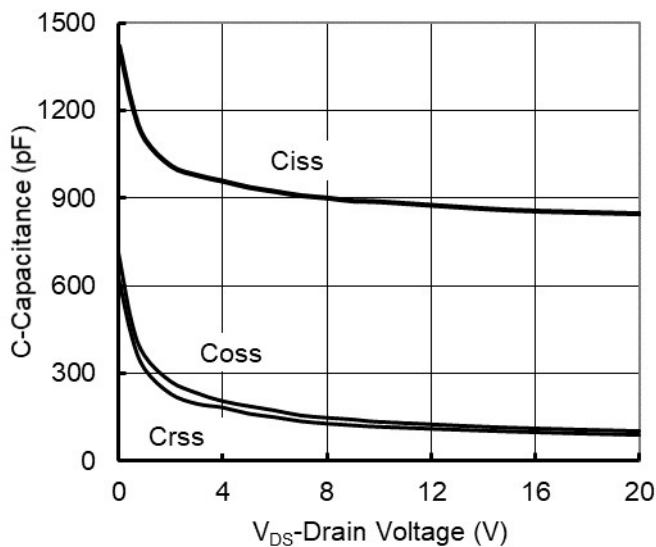


Figure5. Capacitance Characteristics

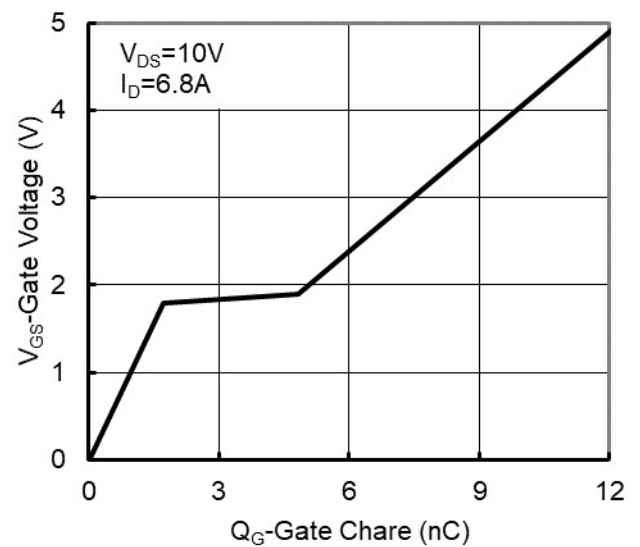


Figure6. Gate Charge

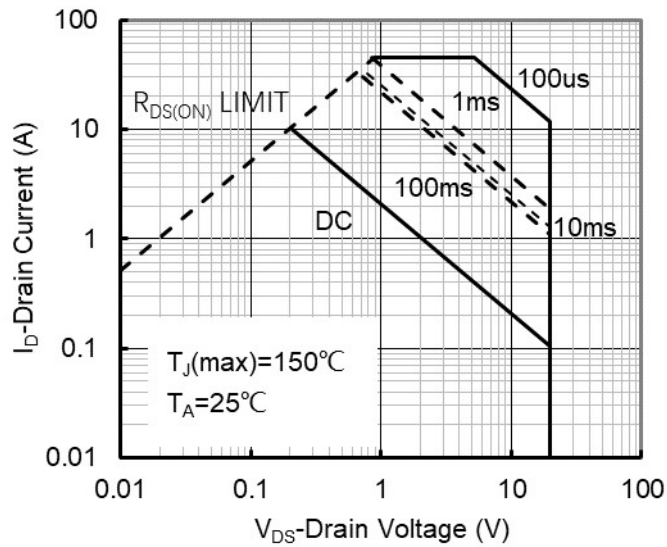


Figure7. Safe Operation Area



Figure8. Maximum Continuous Drain Current vs Ambient Temperature

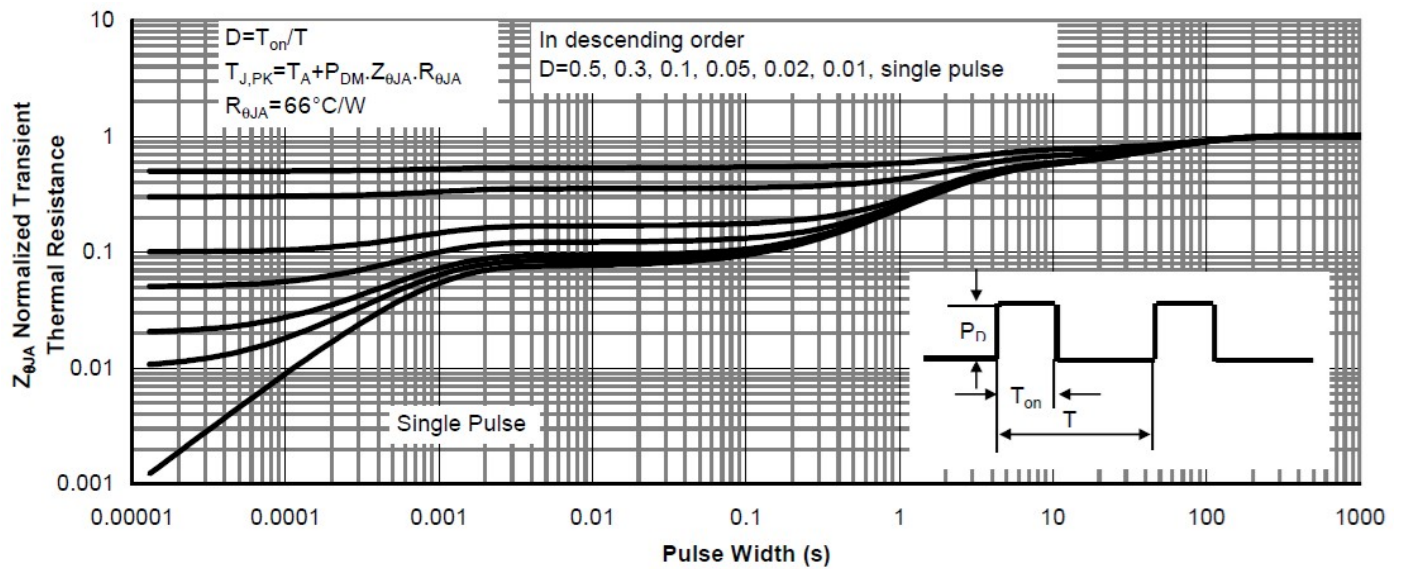


Figure9. Normalized Maximum Transient Thermal Impedance



Resistive Switching Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



Gate Charge Test Circuit & Waveform



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms