

Dual N-Channel Advanced Power MOSFET

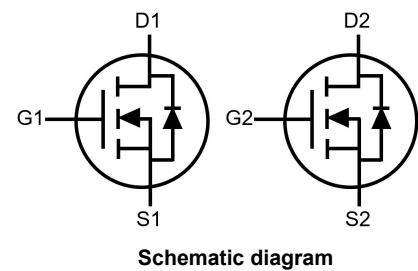
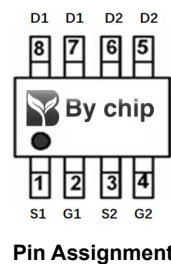
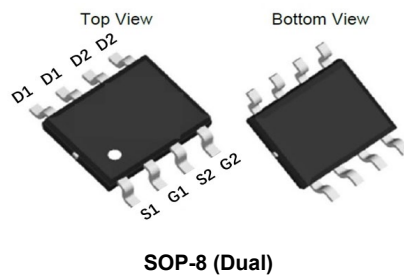
Features

- $V_{DS} = 60V$, $I_D = 5A$
 $R_{DS(ON)} < 30 m\Omega$ @ $V_{GS} = 10V$
 $R_{DS(ON)} < 36 m\Omega$ @ $V_{GS} = 4.5V$

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!



Absolute Maximum Ratings ($T_A = 25^\circ C$ unless otherwise specified)

Symbol	Parameter		Max.	Units
V_{DSS}	Drain-Source Voltage		60	V
V_{GSS}	Gate-Source Voltage		± 20	V
I_D	Continuous Drain Current	$T_A = 25^\circ C$	5	A
		$T_A = 100^\circ C$	3.3	A
I_{DM}	Pulsed Drain Current ^{note1}		20	A
EAS	Single Pulsed Avalanche Energy ^{note2}		20	mJ
P_D	Power Dissipation	$T_A = 25^\circ C$	1.74	W
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient		72	$^\circ C/W$
T_J, T_{STG}	Operating and Storage Temperature Range		-55 to +150	$^\circ C$

Electrical Characteristics (T_J=25°C unless otherwise specified)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
Off Characteristics						
V _{(BR)DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250μA	60	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =60V, V _{GS} = 0V,	-	-	1.0	μA
I _{GSS}	Gate to Body Leakage Current	V _{DS} =0V, V _{GS} = ±20V	-	-	±100	nA
On Characteristics						
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250μA	1.0		2.5	V
R _{DS(on)}	Static Drain-Source on-Resistance note3	V _{GS} =10V, I _D =5A	-		30	mΩ
		V _{GS} =4.5V, I _D =3A	-		36	
Dynamic Characteristics						
C _{iSS}	Input Capacitance	V _{DS} =25V, V _{GS} =0V, f=1.0MHz	-	853	-	pF
C _{oSS}	Output Capacitance		-	60	-	pF
C _{rSS}	Reverse Transfer Capacitance		-	29	-	pF
Q _g	Total Gate Charge	V _{DD} =30V, I _D =2.5A, V _{GS} =10V	-	20	-	nC
Q _{gs}	Gate-Source Charge		-	3	-	nC
Q _{gd}	Gate-Drain(“Miller”) Charge		-	4.5	-	nC
Switching Characteristics						
t _{d(on)}	Turn-on Delay Time	V _{DD} =30V, I _D =5A, R _{GEN} =1.8Ω, V _{GS} =10V	-	6	-	ns
t _r	Turn-on Rise Time		-	6	-	ns
t _{d(off)}	Turn-off Delay Time		-	19	-	ns
t _f	Turn-off Fall Time		-	2.5	-	ns
Drain-Source Diode Characteristics and Maximum Ratings						
I _S	Maximum Continuous Drain to Source Diode Forward Current		-	-	5	A
I _{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	20	A
V _{SD}	Drain to Source Diode Forward Voltage	V _{GS} =0V, I _S =5A	-	-	1.2	V
t _{rr}	Body Diode Reverse Recovery Time	I _F =5A, dI/dt=100A/μs	-	13	-	ns
Q _{rr}	Body Diode Reverse Recovery Charge		-	9	-	nC

Notes:1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature

2. EAS condition :Starting T_J=25°C, V_{DD}=30V, V_{GS}=10V, L=0.5mH, R_g=25Ω, I_{AS}=9A

3. Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%

Typical Performance Characteristics

Figure 1: Output Characteristics

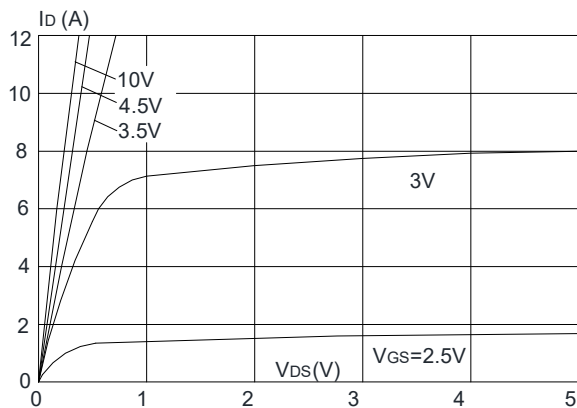


Figure 2: Typical Transfer Characteristics

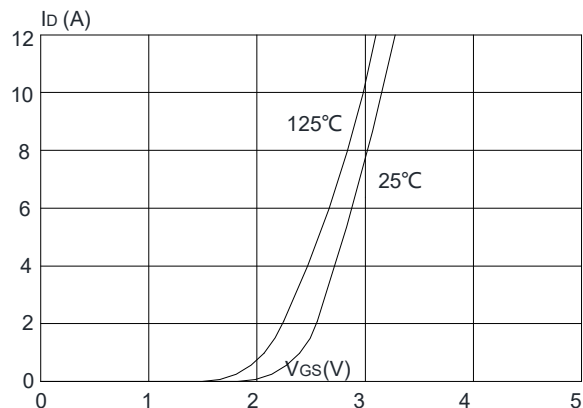


Figure 3: On-resistance vs. Drain Current

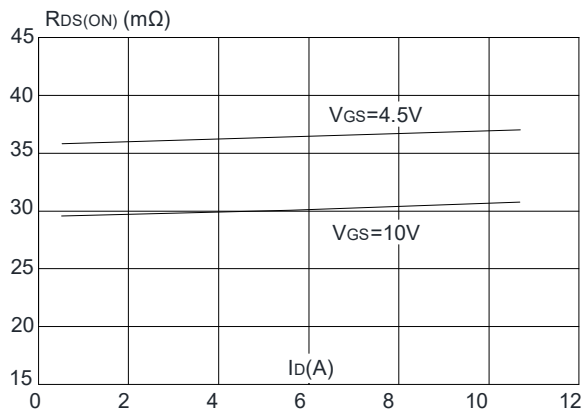


Figure 4: Body Diode Characteristics

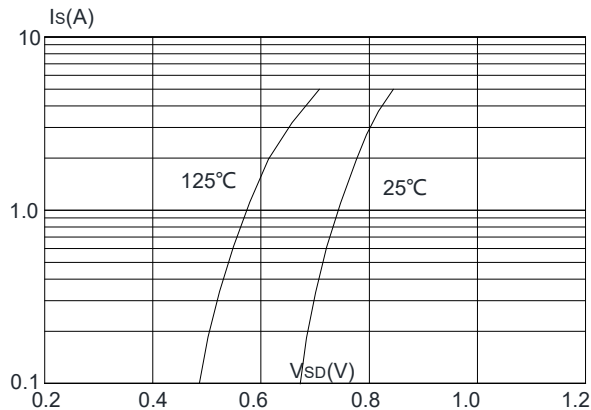


Figure 5: Gate Charge Characteristics

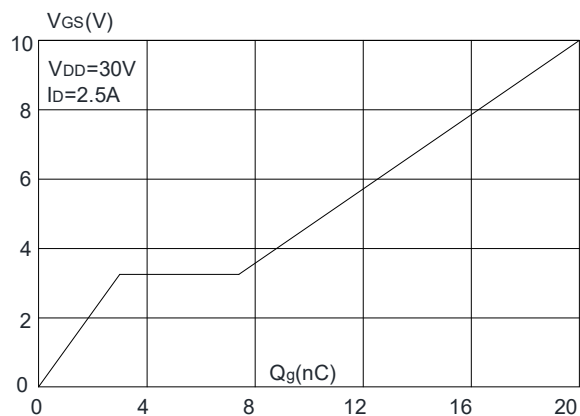


Figure 6: Capacitance Characteristics

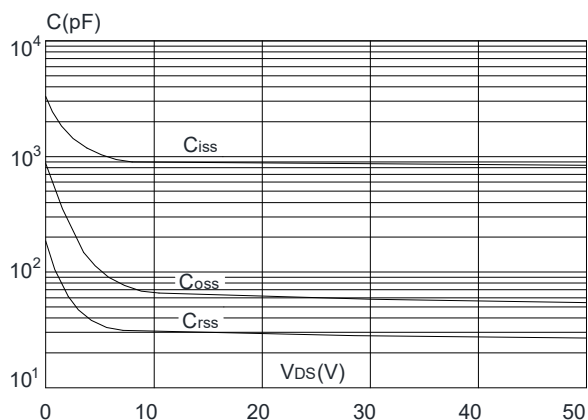


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

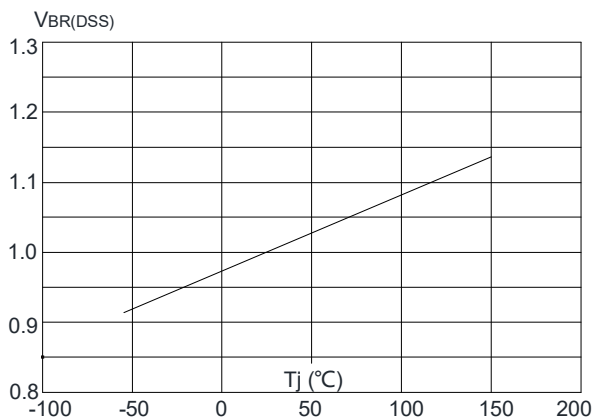


Figure 8: Normalized on Resistance vs. Junction Temperature

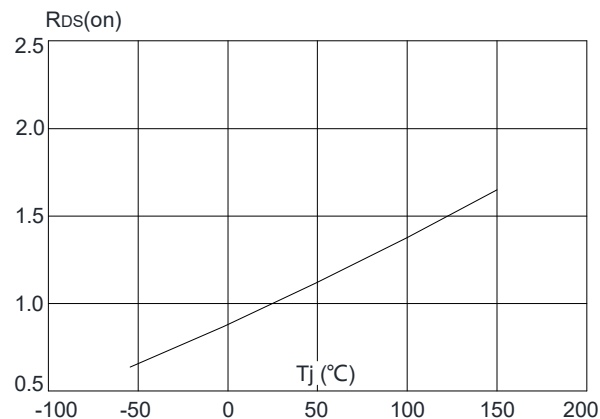


Figure 9: Maximum Safe Operating Area

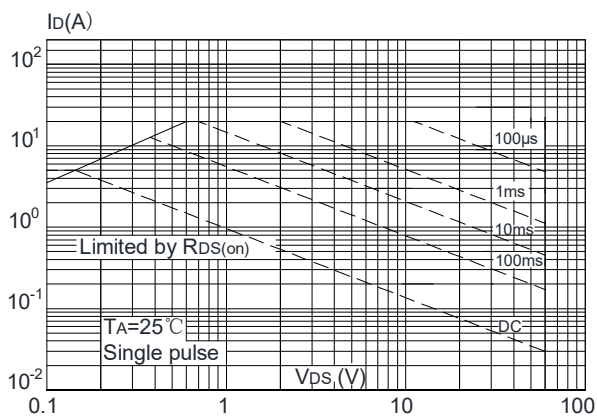


Figure 10: Maximum Continuous Drain Current vs. Ambient Temperature

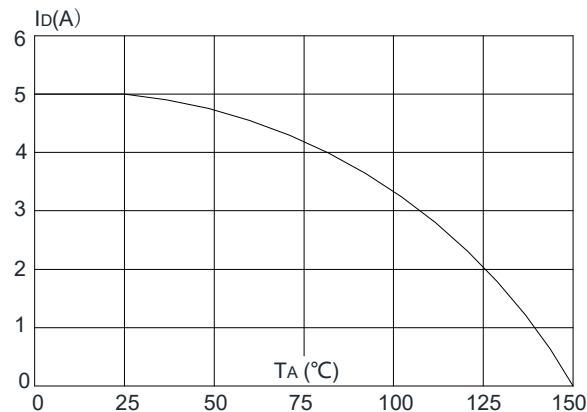
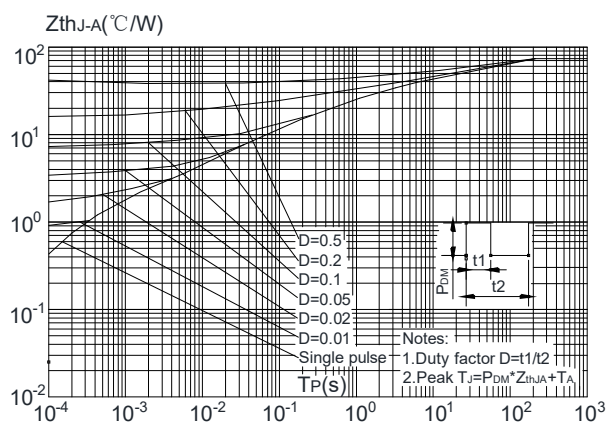


Figure 11: Maximum Effective Transient Thermal Impedance, Junction-to-Ambient



Test Circuit

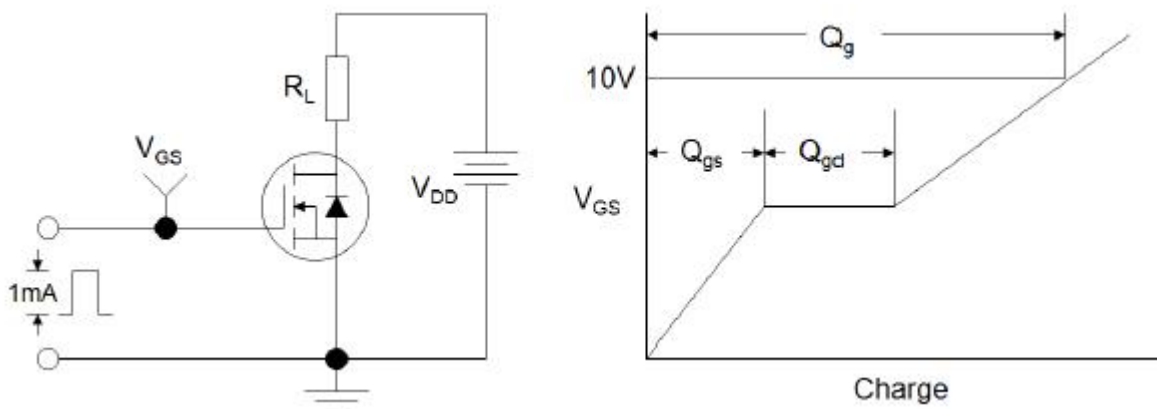


Figure1:Gate Charge Test Circuit & Waveform

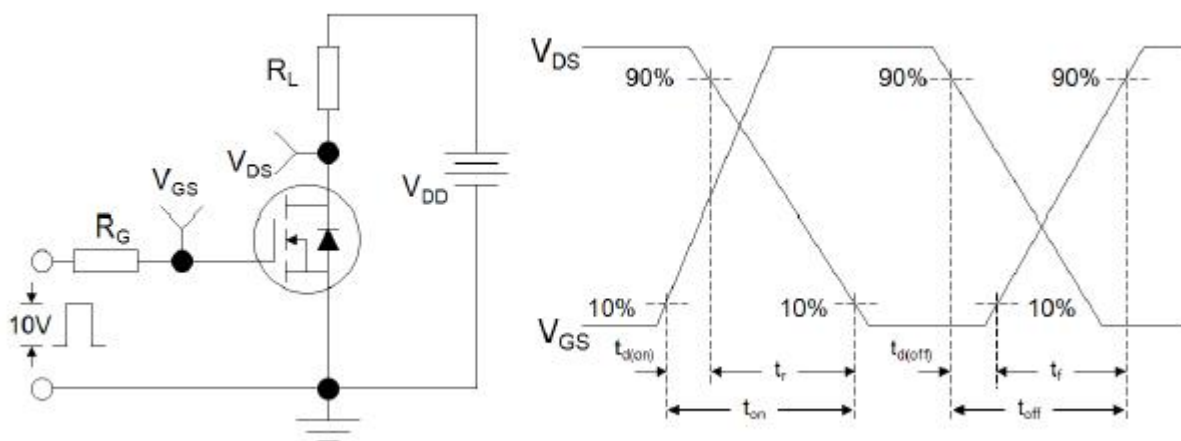


Figure 2: Resistive Switching Test Circuit & Waveforms

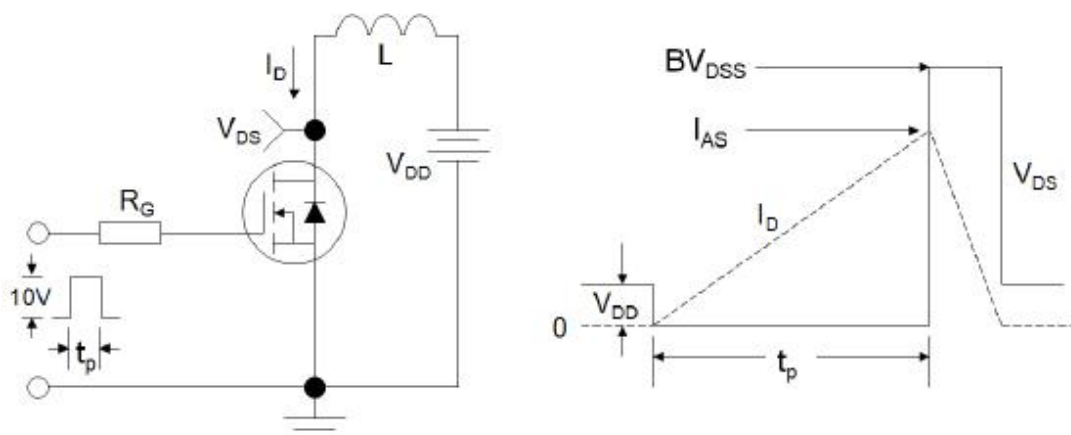


Figure 3:Unclamped Inductive Switching Test Circuit & Waveforms