Dual N-Channel Advanced Power MOSFET

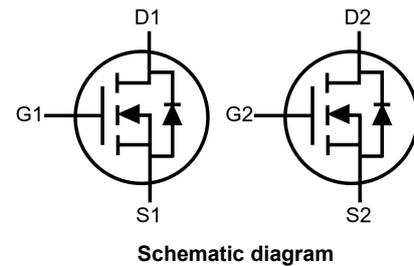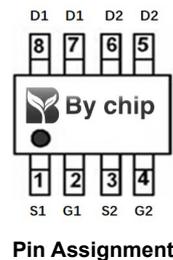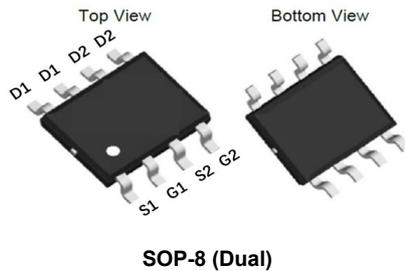## Features

- VDS= 60V, ID= 5 A
  RDS(ON) < 30 mΩ @ VGS = 10V
  RDS(ON) < 36 mΩ @ VGS = 4.5V

General Features

- Advanced Trench Technology
- Provide Excellent RDS(ON) and Low Gate Charge
- Lead Free and Green Available

100% UIS TESTED!
100% ΔVds TESTED!

RoHS

SOP-8 (Dual)

Pin Assignment

Schematic diagram

Absolute Maximum Ratings (T_A=25℃ 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	$T_A = 25℃$	5	A
		$T_A = 100℃$	3.3	A
I_{DM}	Pulsed Drain Current [note1]		20	A
EAS	Single Pulsed Avalanche Energy [note2]		20	mJ
P_D	Power Dissipation	$T_A = 25℃$	1.74	W
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient		72	℃/W
T_J, T_{STG}	Operating and Storage Temperature Range		-55 to +150	℃

Electrical Characteristics (T$_J$=25℃ 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$_{DS(on)}$ note3	Static Drain-Source on-Resistance	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
trr	Body Diode Reverse Recovery Time	I$_F$=5A, dI/dt=100A/µs	-	13	-	ns
Qrr	Body Diode Reverse Recovery Charge		-	9	-	nC

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

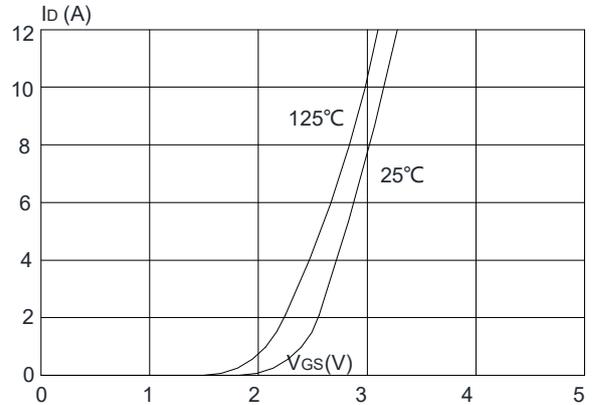2. EAS condition :Starting T$_J$=25℃,V$_{DD}$=30V,V$_{GS}$=10V,L=0.5mH,Rg=25Ω,I$_{AS}$=9A

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

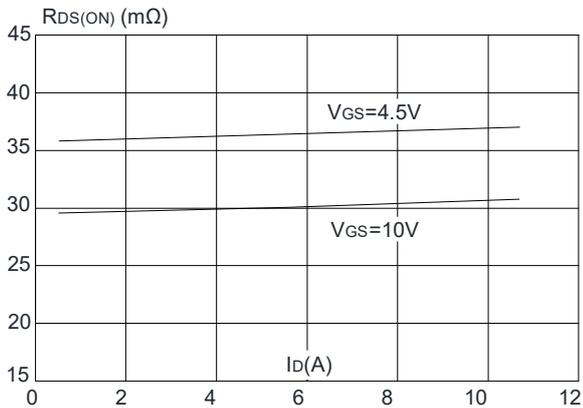# Typical Performance Characteristics
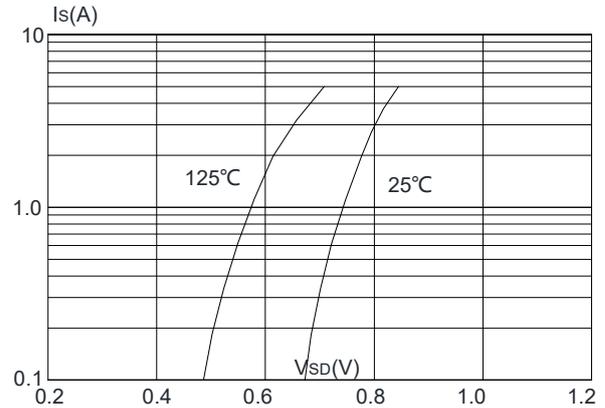
Figure 1: Output Characteristics
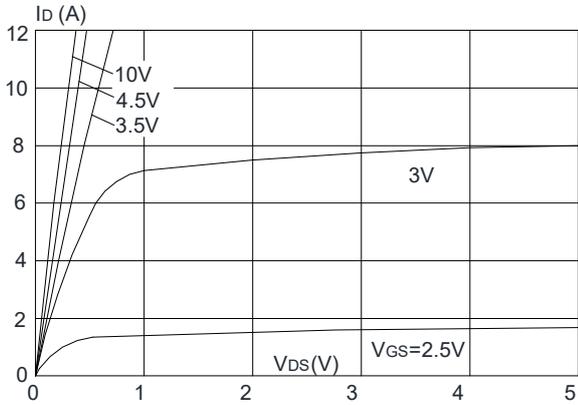
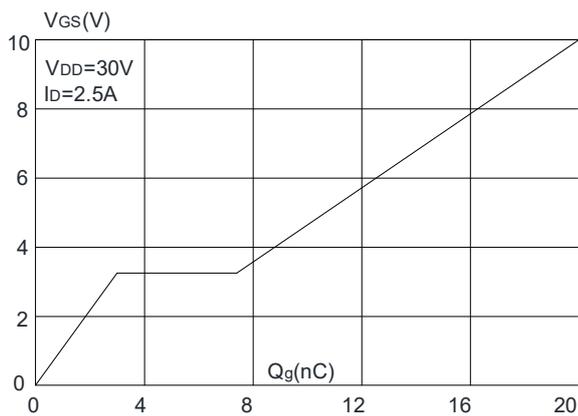**Figure 2:** Typical Transfer Characteristics

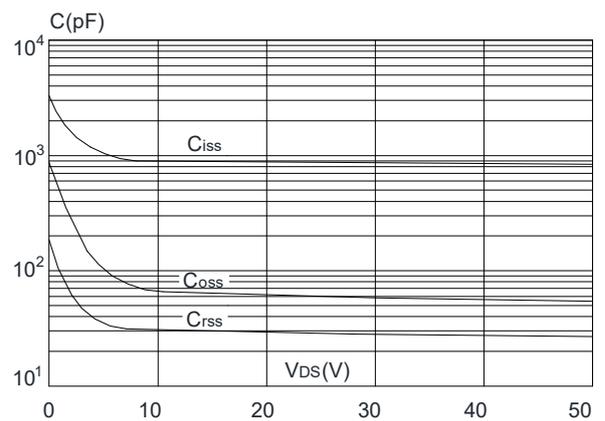**Figure 3:** On-resistance vs. Drain Current

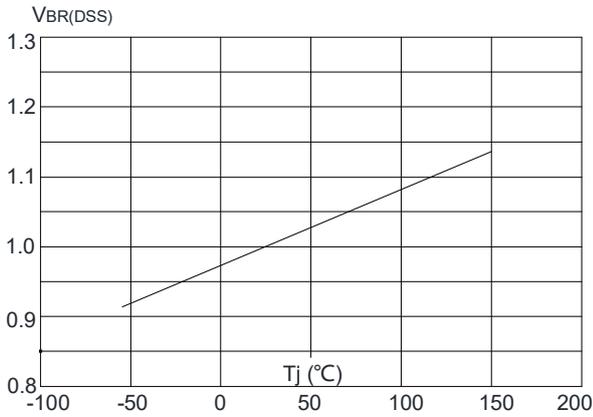**Figure 4:** Body Diode Characteristics

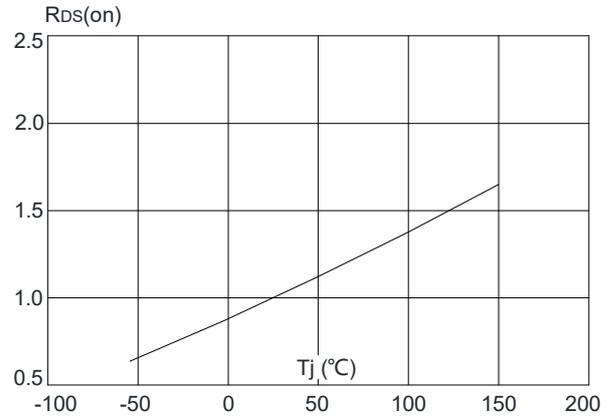**Figure 5:** Gate Charge Characteristics
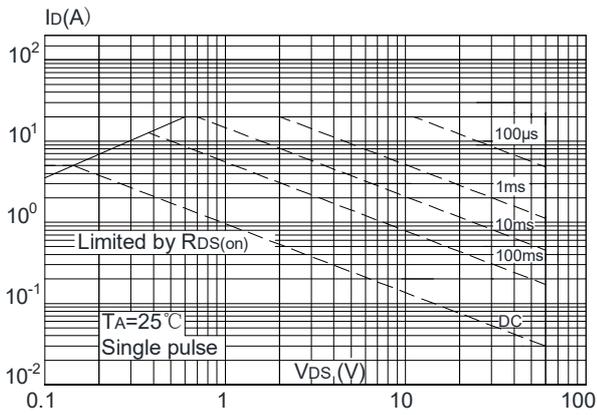

Figure 6: Capacitance Characteristics

Figure 7: Normalized Breakdown Voltage vs. Junction Temperature
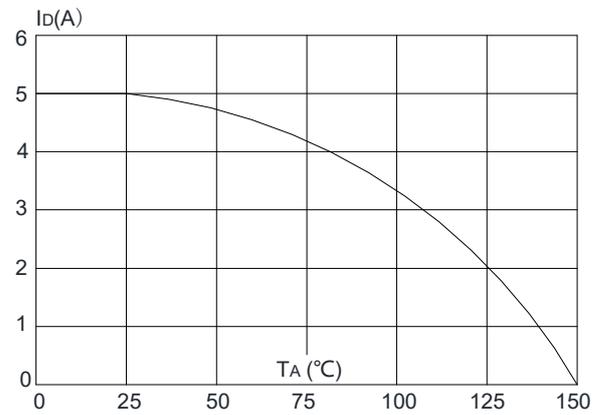

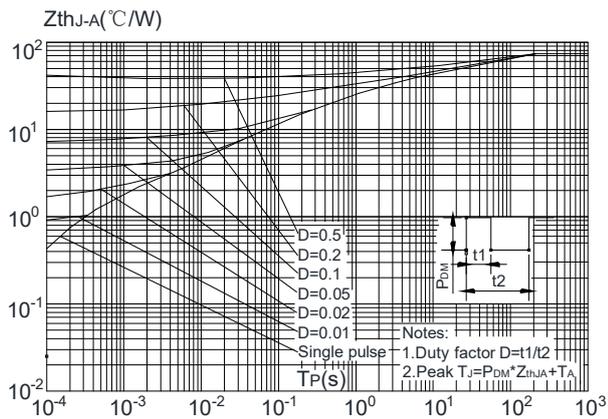**Figure 8:** Normalized on Resistance vs. Junction Temperature

Figure 9: Maximum Safe Operating Area

Figure 10: Maximum Continuous Drain Current vs. Ambient Temperature

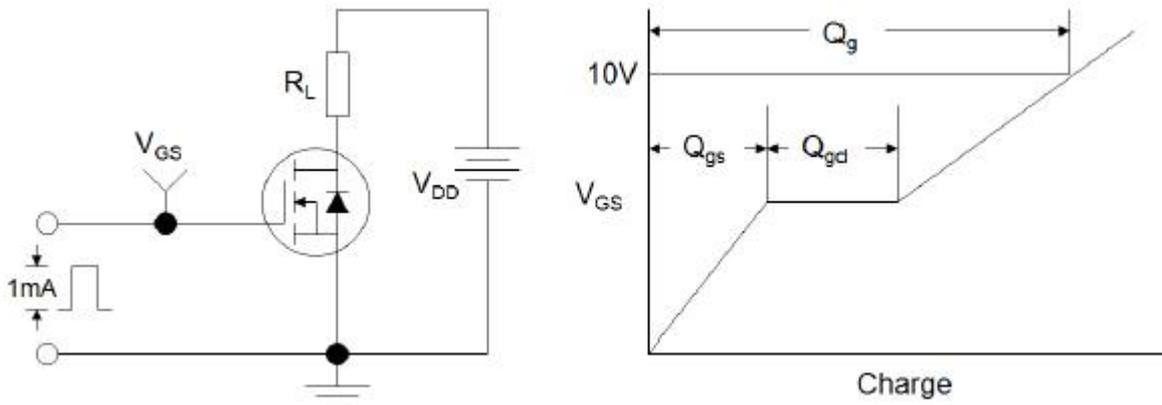**Figure 11:** Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

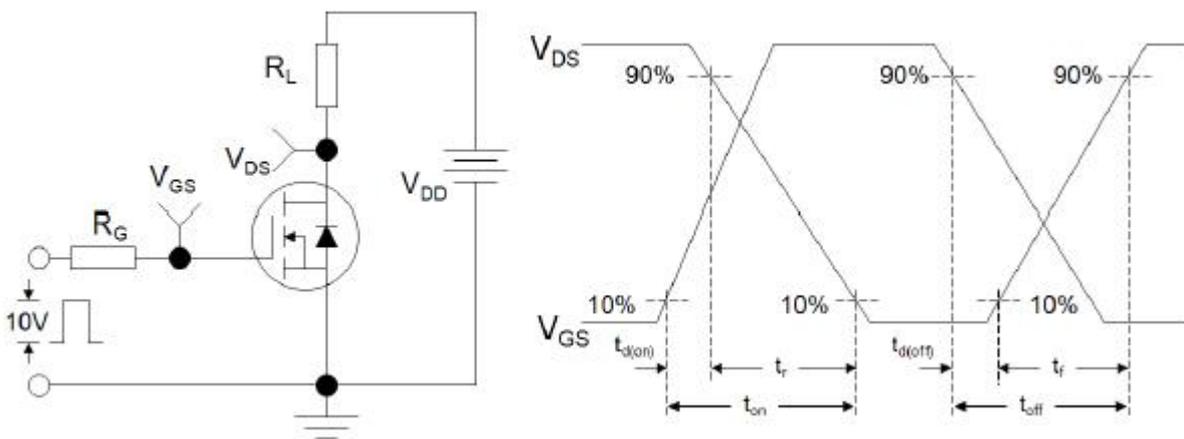# Test Circuit

Figure1:Gate Charge Test Circuit & Waveform

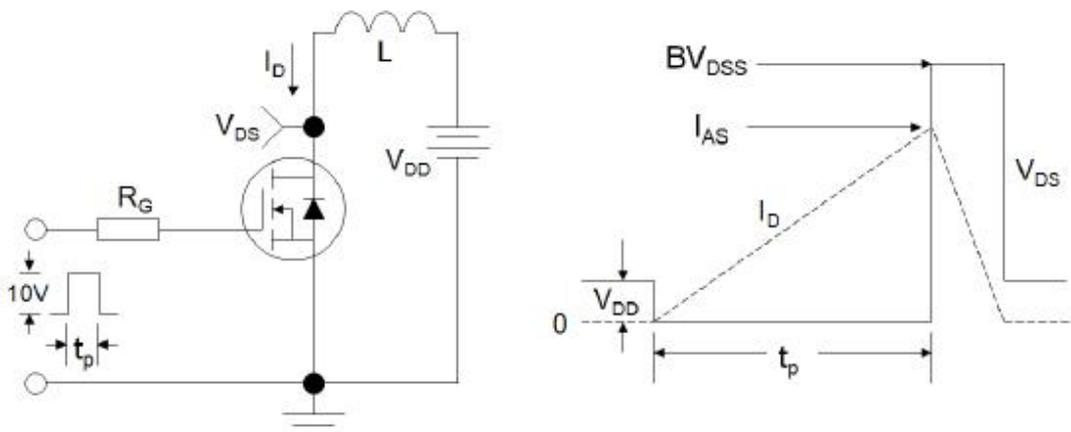**Figure 2: Resistive Switching Test Circuit & Waveforms**

Figure 3:Unclamped Inductive Switching Test Circuit & Waveforms