

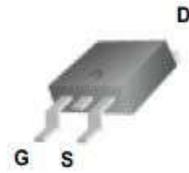


奧德利®  
AUDLEY

## U5N65 / D5N65

### Features:

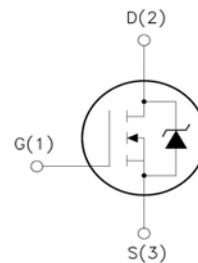
- Low Intrinsic Capacitances.
- Excellent Switching Characteristics.
- Extended Safe Operating Area.
- Unrivalled Gate Charge :Qg=15nC (Typ.).
- BVDSS=650V, I<sub>D</sub>=5A
- R<sub>DS(on)</sub> : 2.5 Ω (Max) @V<sub>G</sub>=10V
- 100% Avalanche Tested



TO-252



TO-251



1. Gate (G)
2. Drain (D)
3. Source (S)

### Absolute Maximum Ratings (Ta=25°C unless otherwise noted)

Symbol	Parameter	Value	Unit
V <sub>DSS</sub>	Drain-Source Voltage	650	V
I <sub>D</sub>	Drain Current	T <sub>j</sub> =25°C	5
		T <sub>j</sub> =100°C	1.8
V <sub>GS(TH)</sub>	Gate Threshold Voltage	±30	V
E <sub>AS</sub>	Single Pulse Avalanche Energy (note1)	240	mJ
I <sub>AR</sub>	Avalanche Current (note2)	5	A
P <sub>D</sub>	Power Dissipation (T <sub>j</sub> =25°C)	44	W
T <sub>j</sub>	Junction Temperature(Max)	150	°C
T <sub>stg</sub>	Storage Temperature	-55~+150	°C
TL	Maximum lead temperature for soldering purpose, 1/8" from case for 5 seconds	300	°C

### Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Unit
R <sub>θJC</sub>	Thermal Resistance, Junction to Case	-	2.56	°C/W
R <sub>θJA</sub>	Thermal Resistance, Junction to Ambient	-	110	°C/W

## Electrical Characteristics (Ta=25°C unless otherwise noted)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
<b>Off Characteristics</b>						
$BV_{DSS}$	Drain-Source Breakdown Voltage	$I_D=250\mu A, V_{GS}=0$	650	-	-	V
$\Delta BV_{DSS}/\Delta T_J$	Breakdown Voltage Temperature Coefficient	$I_D=250\mu A$ , Reference to 25°C	-	0.6	-	V/°C
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS}=650V, V_{GS}=0V$	-	-	1	$\mu A$
		$V_{DS}=480V, T_J=125^\circ C$			10	
$I_{GSSF}$	Gate-body leakage Current, Forward	$V_{GS}=+30V, V_{DS}=0V$	-	-	100	nA
$I_{GSSR}$	Gate-body leakage Current, Reverse	$V_{GS}=-30V, V_{DS}=0V$	-	-	-100	
<b>On Characteristics</b>						
$V_{GS(TH)}$	Gate Threshold Voltage	$I_D=250\mu A, V_{DS}=V_{GS}$	2	-	4	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance	$I_D=2.5A, V_{GS}=10V$	-	-	2.5	$\Omega$
<b>Dynamic Characteristics</b>						
$C_{iss}$	Input Capacitance	$V_{DS}=25V, V_{GS}=0, f=1.0MHz$	-	510	670	$\mu F$
$C_{oss}$	Output Capacitance		-	55	72	
$C_{rss}$	Reverse Transfer Capacitance		-	6.5	8.5	
<b>Switching Characteristics</b>						
$T_d(on)$	Turn-On Delay Time	$V_{DD}=300V, I_D=5A, R_G=25\Omega$ (Note 3,4)	-	150	30	nS
$T_r$	Turn-On Rise Time		-	42	90	
$T_d(off)$	Turn-Off Delay Time		-	38	85	
$T_f$	Turn-Off Rise Time		-	46	100	
$Q_g$	Total Gate Charge	$V_{DS}=480V, V_{GS}=10V, I_D=5A$ (Note 3,4)	-	15	19	nC
$Q_{gs}$	Gate-Source Charge		-	2.0	-	
$Q_{gd}$	Gate-Drain Charge		-	6.6	-	
<b>Drain-Source Diode Characteristics and Maximum Ratings</b>						
$I_S$	Max. Diode Forward Current	-	-	-	5	A
$I_{SM}$	Max. Pulsed Forward Current	-	-	-	16	
$V_{SD}$	Diode Forward Voltage	$I_D=5A$	-	-	1.25	V
$T_{rr}$	Reverse Recovery Time	$I_S=5A, V_{GS}=0V, diF/dt=100A/\mu s$ (Note3)	-	300	-	nS
$Q_{rr}$	Reverse Recovery Charge		-	2.2	-	$\mu C$

- Notes : 1, L=27.5mH, IAS=4A, VDD=50V, RG=25 $\Omega$ , Starting T<sub>J</sub> =25°C  
 2, Repetitive Rating : Pulse width limited by maximum junction temperature  
 3, Pulse Test : Pulse Width  $\leq$  300 $\mu s$ , Duty Cycle  $\leq$  2%  
 4, Essentially Independent of Operating Temperature

### Typical Characteristics

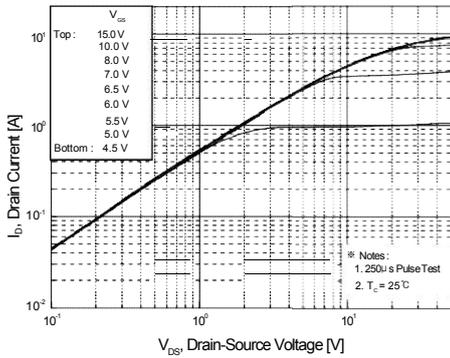


Figure 1. On-Region Characteristics

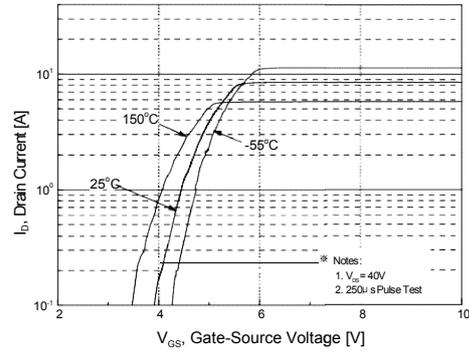


Figure 2. Transfer Characteristics

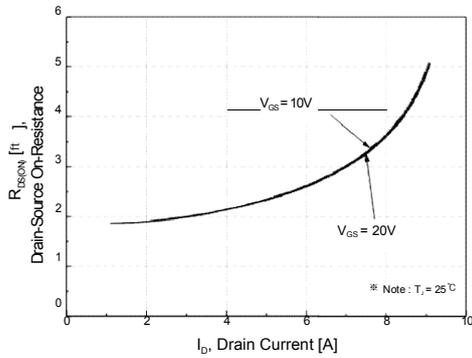


Figure 3. On-Resistance Variation vs. Drain Current and Gate Voltage

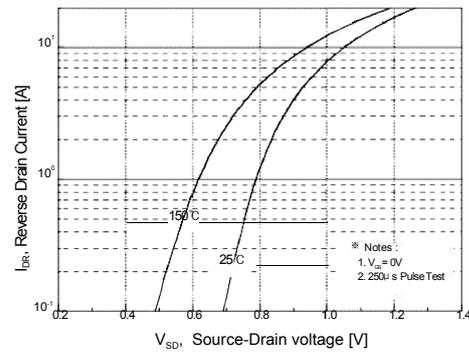


Figure 4. Body Diode Forward Voltage Variation with Source Current and Temperature

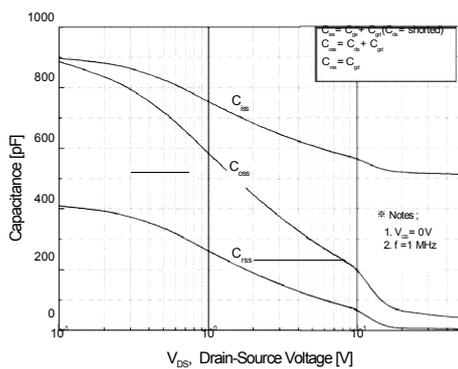


Figure 5. Capacitance Characteristics

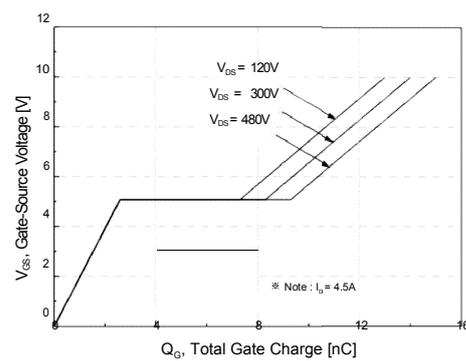
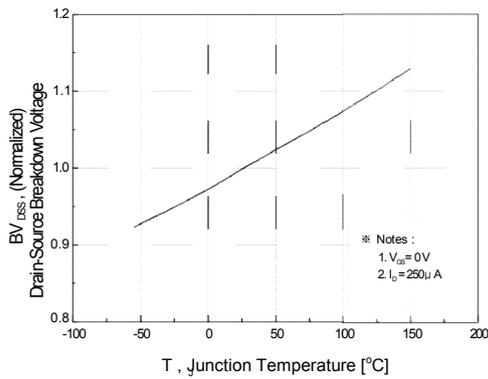
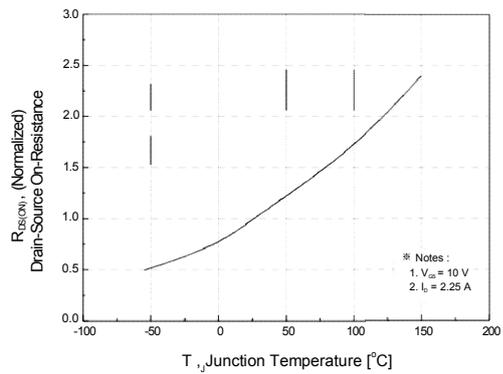


Figure 6. Gate Charge Characteristics

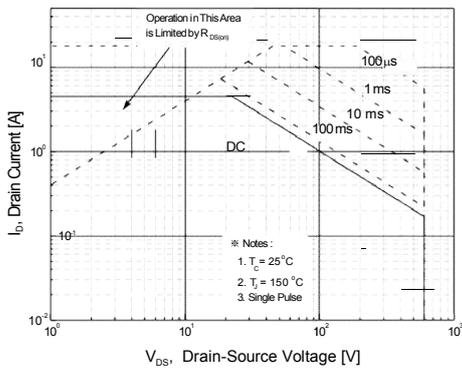
### Typical Characteristics (Continued)



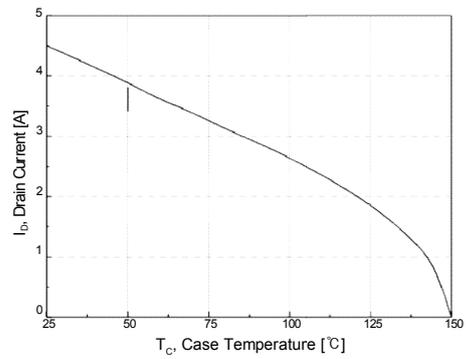
**Figure 7. Breakdown Voltage Variation vs Temperature**



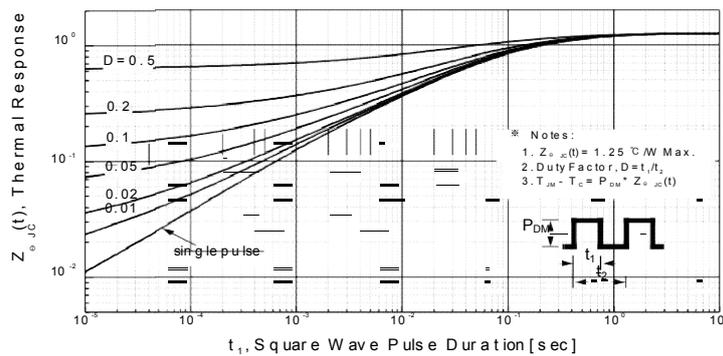
**Figure 8. On-Resistance Variation vs Temperature**



**Figure 9-1. Maximum Safe Operating Area**

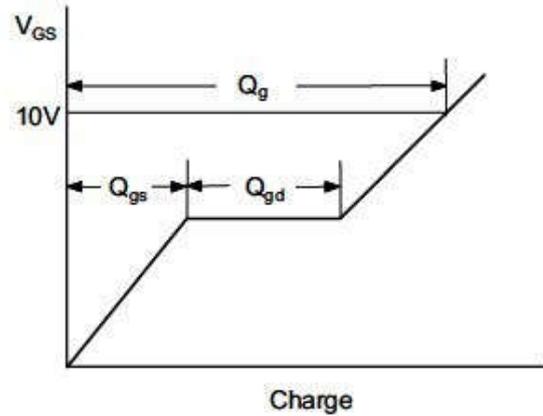
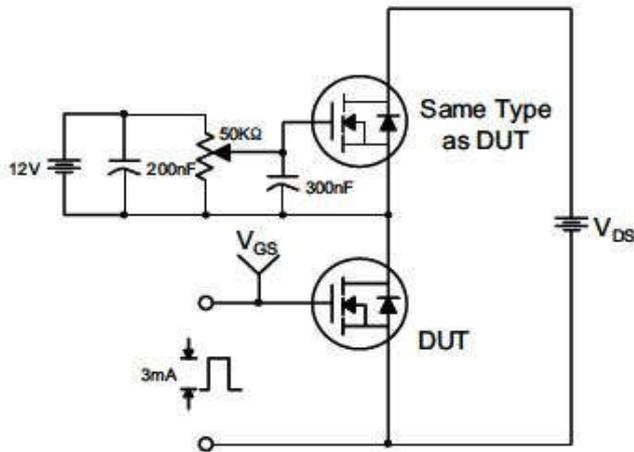


**Figure 10. Maximum Drain Current vs Case Temperature**

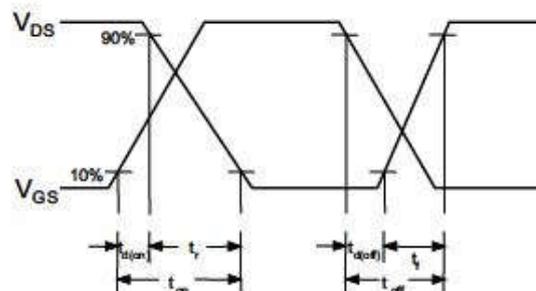
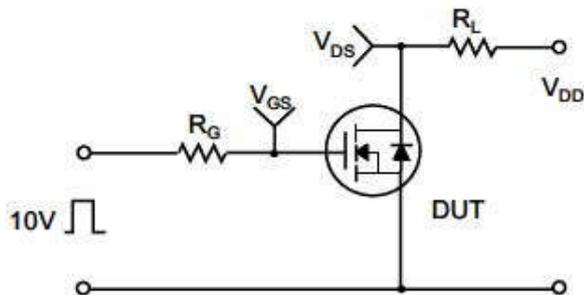


**Figure 11-1. Transient Thermal Response Curve**

### Gate Charge Test Circuit & Waveform



### Resistive Switching Test Circuit & Waveforms



### Unclamped Inductive Switching Test Circuit & Waveforms

