



## Description

The AUIRFR5305TR uses advanced trench technology to provide excellent  $R_{DS(ON)}$ , low gate charge and operation with gate voltages as low as 4.5V. This device is suitable for use as a Battery protection or in other Switching application.

## General Features

$V_{DS} = -60V, I_D = -30A$

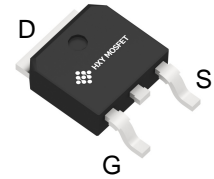
$R_{DS(ON)} < 33m\Omega @ V_{GS} = -10V$

## Application

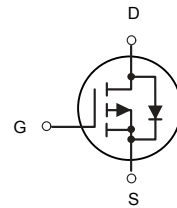
PWM applications

Load switch

Power management



**TO-252-2L  
(DPAK)**



P-Channel MOSFET

## Ordering Information

Product ID	Pack	Brand	Qty(PCS)
AUIRFR5305TR	TO-252-2L(DPAK)	HXY MOSFET	2500

## ABSOLUTE MAXIMUM RATINGS(TA=25°C unless otherwise noted)

Symbol	Parameter	Limit	Unit
$V_{DS}$	Drain-Source Voltage ( $V_{GS}=0V$ )	-60	V
$V_{GS}$	Gate-Source Voltage ( $V_{DS}=0V$ )	$\pm 20$	V
$I_D$	Drain Current-Continuous( $T_C=25^\circ C$ )	-30	A
	Drain Current-Continuous( $T_C=100^\circ C$ )	-25.5	A
$I_{DM (pluse)}$	Drain Current-Continuous@ Current-Pulsed (Note 1)	-144	A
$P_D$	Maximum Power Dissipation( $T_C=25^\circ C$ )	79	W
	Maximum Power Dissipation( $T_C=100^\circ C$ )	39.5	W
$E_{AS}$	Avalanche energy (Note 2)	196	mJ
$T_J, T_{STG}$	Operating Junction and Storage Temperature Range	-55 To 175	$^\circ C$



**Electrical Characteristics ( $T_J=25^{\circ}\text{C}$  unless otherwise noted)**

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=-250\mu A$	-60			V
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS}=-60V, V_{GS}=0V$			-1	$\mu A$
$I_{GSS}$	Gate-Body Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$			$\pm 100$	nA
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=-250\mu A$	-1	-1.8	-2.5	V
$g_{FS}$	Forward Transconductance	$V_{DS}=-5V, I_D=-15A$		35		S
$R_{DS(on)}$	Drain-Source On-State Resistance	$V_{GS}=-10V, I_D=-15A$		29	33	m $\Omega$
		$V_{GS}=-4.5V, I_D=-10A$		35	46	m $\Omega$
$C_{iss}$	Input Capacitance	$V_{DS}=-25V, V_{GS}=0V,$ $f=1.0MHz$		4026		pF
$C_{oss}$	Output Capacitance			134		pF
$C_{riss}$	Reverse Transfer Capacitance			98		pF
$t_{d(on)}$	Turn-on Delay Time	$V_{GS}=-10V, V_{DS}=-30V,$ $R_L=1.5\Omega, R_{GEN}=3\Omega$		12.2		nS
$t_r$	Turn-on Rise Time			10		nS
$t_{d(off)}$	Turn-Off Delay Time			64		nS
$t_f$	Turn-Off Fall Time			14		nS
$Q_g$	Total Gate Charge	$V_{GS}=-10V, V_{DS}=-30V, I_D=-20A$		68		nC
$Q_{gs}$	Gate-Source Charge			10.5		nC
$Q_{gd}$	Gate-Drain Charge			13		nC
$I_{SD}$	Source-Drain Current (Body Diode)				30	A
$V_{SD}$	Forward on Voltage (Note 3)	$V_{GS}=0V, I_S=-15A$			-1.2	V
$t_{rr}$	Reverse Recovery Time	$I_F=-20A, di/dt=100A/\mu s$		26		ns
$Q_{rr}$	Reverse Recovery Charge	$I_F=-20A, di/dt=100A/\mu s$		29		nC

Notes 1.Repetitive Rating: Pulse width limited by maximum junction temperature.

Notes 2.  $E_{AS}$  condition:  $T_J=25^{\circ}\text{C}, V_{DD}=40V, V_G=-10V, R_g=25\Omega, L=0.5mH$ .

Notes 3.Repetitive Rating: Pulse width limited by maximum junction temperature.



## Typical Electrical And Thermal Characteristics (Curves)

Figure 1. Output Characteristics

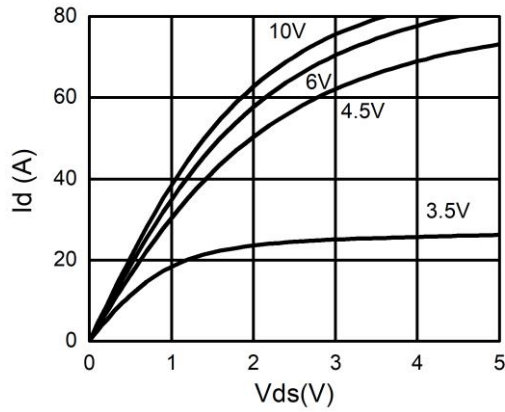


Figure 2. Transfer Characteristics

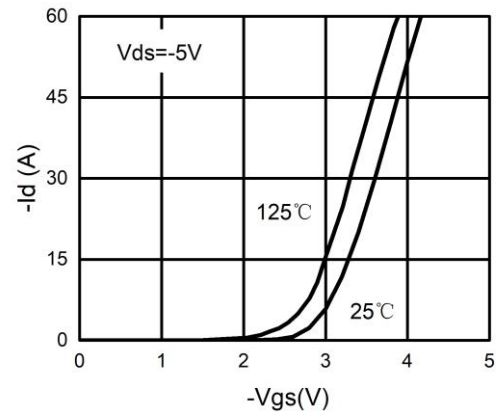


Figure 3. Power Dissipation

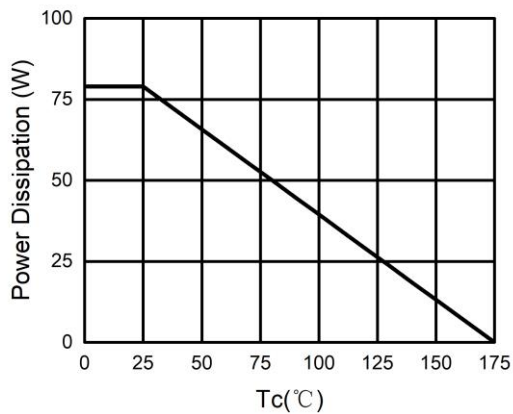


Figure 4. Drain Current

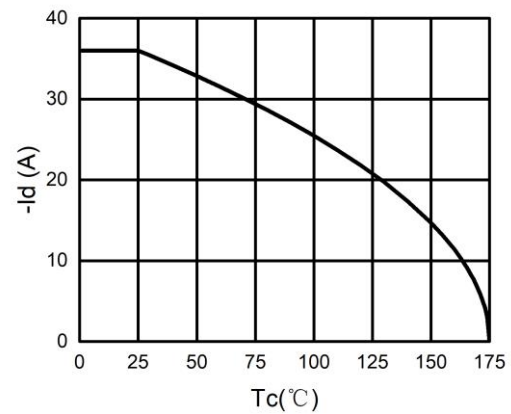


Figure 5.  $BV_{DSS}$  vs Junction Temperature

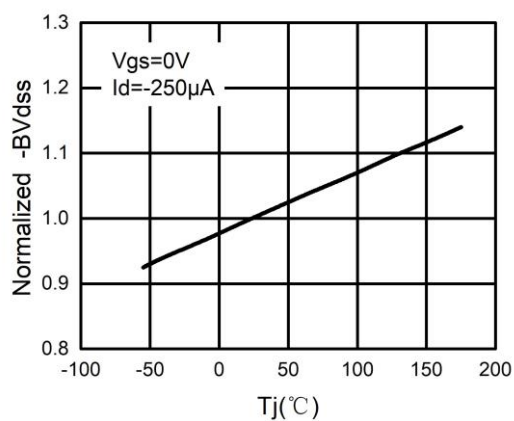


Figure 6.  $R_{DS(ON)}$  vs Junction Temperature

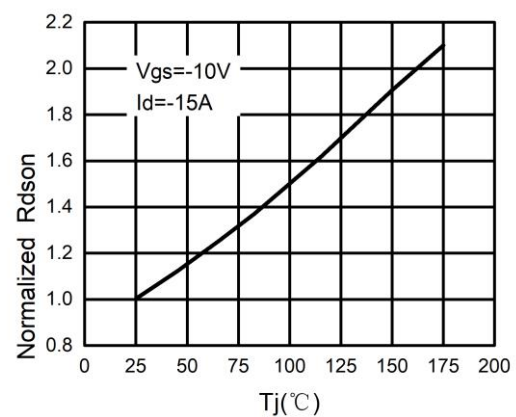




Figure 7. Gate Charge Waveforms

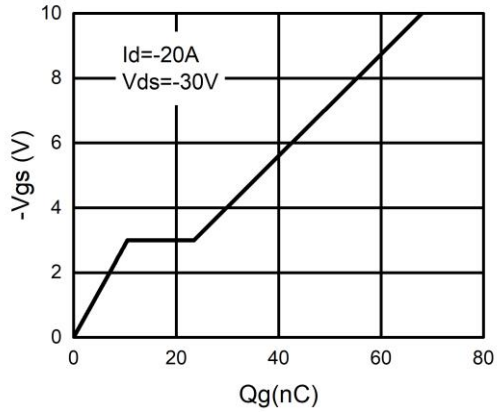


Figure 8. Capacitance

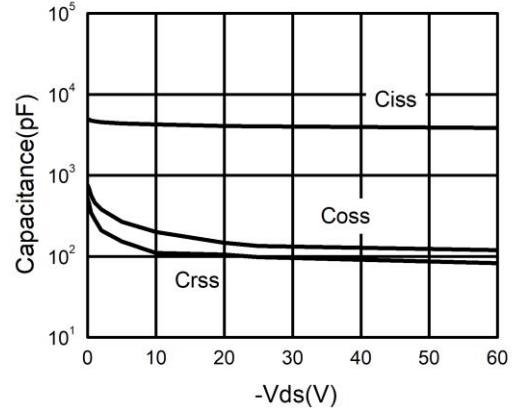


Figure 9. Body-Diode Characteristics

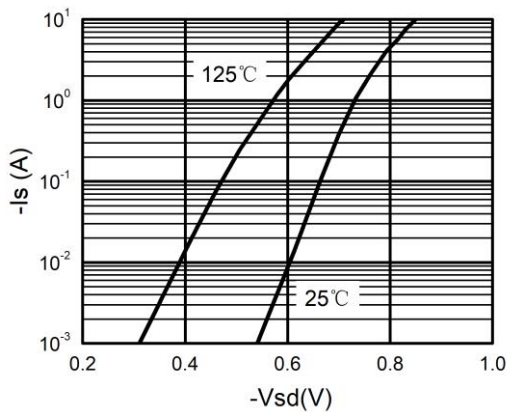
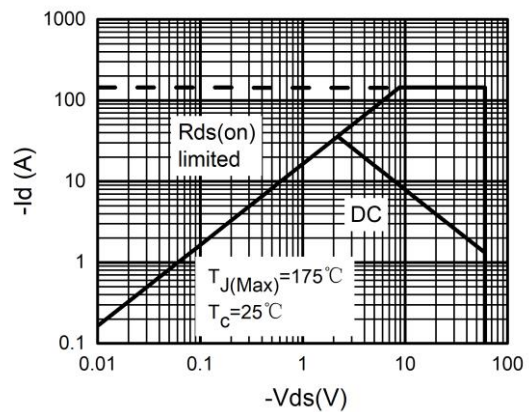
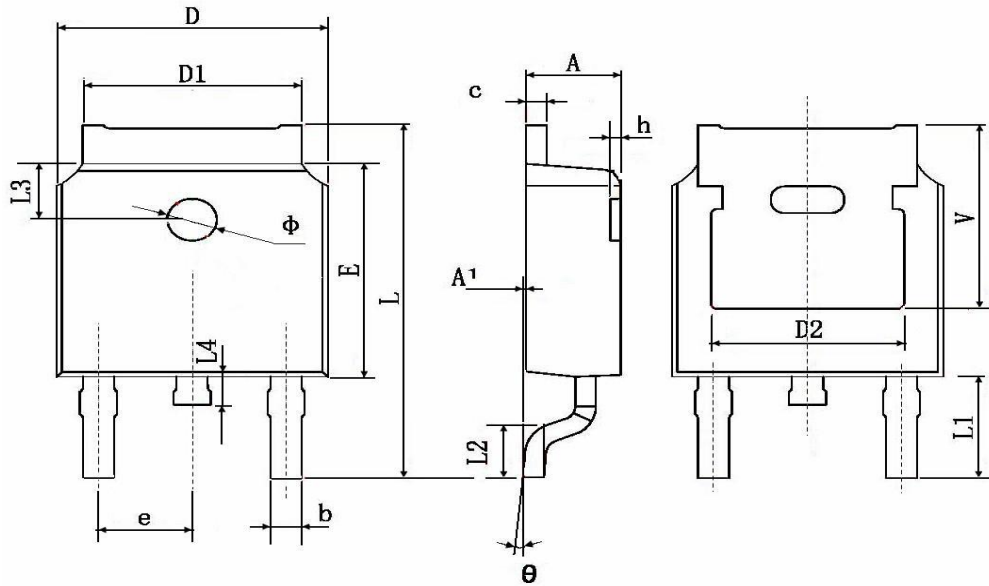


Figure 10. Maximum Safe Operating Area





### TO-252-2L(DPAK) Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.200	2.400	0.087	0.094
A1	0.000	0.127	0.000	0.005
b	0.660	0.860	0.026	0.034
c	0.460	0.580	0.018	0.023
D	6.500	6.700	0.256	0.264
D1	5.100	5.460	0.201	0.215
D2	4.830 TYP.		0.190 TYP.	
E	6.000	6.200	0.236	0.244
e	2.186	2.386	0.086	0.094
L	9.800	10.400	0.386	0.409
L1	2.900 TYP.		0.114 TYP.	
L2	1.400	1.700	0.055	0.067
L3	1.600 TYP.		0.063 TYP.	
L4	0.600	1.000	0.024	0.039
φ	1.100	1.300	0.043	0.051
θ	0°	8°	0°	8°
h	0.000	0.300	0.000	0.012
V	5.350 TYP.		0.211 TYP.	



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