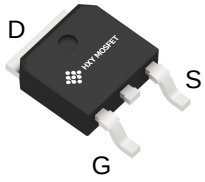
AUIRFR540Z

N-Channel Enhancement Mode MOSFET

Description

The AUIRFR540Z uses advanced trench technology to provide excellent RDS(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.

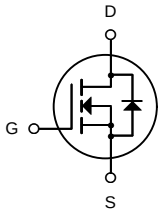


TO-252-2L

General Features

V_{DS}= 100V I_D= 30A

$R_{DS(ON)}$< 30 mΩ@ V_{GS}=10V



N-Channel MOSFET

Application

Battery protection

Load switch

Uninterruptible power supply

Ordering Information

Product ID	Pack	Brand	Qty(PCS)
AUIRFR540Z	TO-252-2L	HXY MOSFET	2500

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

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	100	V
V_{GS}	Gate-Source Voltage	±20	V
I_D	Drain Current – Continuous (T_C=25°C)	30	A
	Drain Current – Continuous (T_C=100°C)	20	A
I_{DM}	Drain Current – Pulsed	120	A
EAS	Single Pulse Avalanche Energy	56	mJ
IAS	Single Pulse Avalanche Current	42	A
P_D	Power Dissipation (T_C=25°C)	88	W
	Power Dissipation – Derate above 25°C	0.43	W/°C
T_{STG}	Storage Temperature Range	-55 to 175	°C
T_J	Operating Junction Temperature Range	-55 to 175	°C
$R_{\theta JA}$	Thermal Resistance Junction to ambient	62	°C/W
$R_{\theta JC}$	Thermal Resistance Junction to Case	1.7	°C/W

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

Symbol	Parameter	Conditions	Min	Typ	Max	Units
BV_{DSS}	Drain-Sourtce Breakdown Voltage	V_{GS}=0V,I_D=250μA	100	---	---	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{GS}=0V, V_{DS}=100V	---	---	1	μA
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±20V, V_{DS}=0A	---	---	±100	nA
$V_{GS(th)}$	GATE-Source Threshold Voltage	V_{GS}=V_{DS}, I_D=250μA	1	1.5	2.5	V
$R_{DS(ON)}$	Drain-Source On Resistance[2]	V_{GS}=10V,I_D=20A	---	24	30	mΩ
		V_{GS}=4.5V,I_D=10A	---	26	34	mΩ
C_{iss}	Input Capacitance	V_{DS}=25V, V_{GS}=0V, f=1MHz	---	2857	---	pF
C_{oss}	Output Capacitance		---	126	--	
C_{rss}	Reverse Transfer Capacitance		---	99	---	
$t_{d(on)}$	Turn-On Delay Time	V_{DS}=30V, I_D=15A, R_{ENG}=1.8Ω,V_{GS}=10V	---	10	---	ns
t_r	Rise Time		---	44	---	ns
$t_{d(off)}$	Turn-Off Delay Time		---	66	---	ns
t_f	Fall Time		---	47	---	ns
Q_{gs}	Total Gate Charge	V_{GS}=10V, V_{DS}=30V, I_D=15A	---	65	---	nc
Q_{gd}	Gate-Source Charge		---	9	---	nc
Q_g	Gate-Drain “Miller” Charge		---	13	---	nc
V_{SD}	Diode Forward Voltage	V_{GS}=0V, I_{SD}=30A	---	---	1.2	V
I_S	Continuous Drain Curren	VD=VG=0V	---	---	30	A
I_{SM}	Pulsed Drain Current		---	---	120	A
Trr	Reverse Recovery Time	I_F=30A,T_J=25℃ dI/dt=100A/us	---	28	---	ns
Qrr	Reverse Recovery Charge		---	40	---	nc

Notes:

1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature
2. EAS condition : T_J=25℃, V_{DD}=50V, V_G=10V, L=0.5mH, Rg=25Ω, I_{AS}=15A
3. Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%

Typical Characteristics

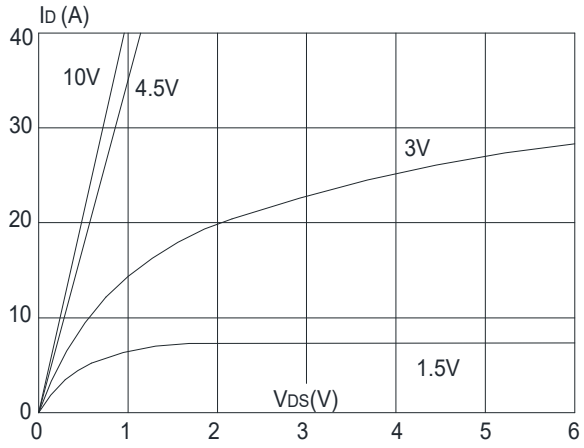


Figure1: Output Characteristics

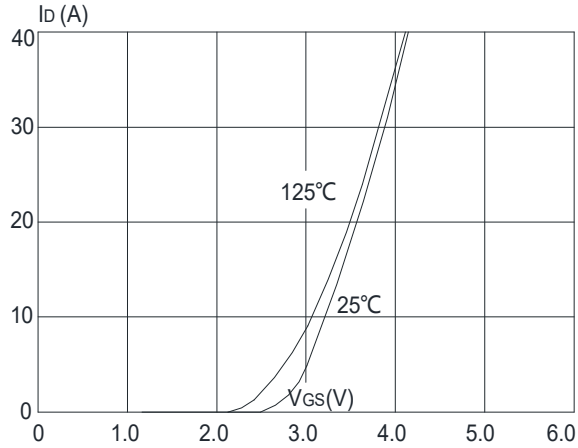


Figure 2: Typical Transfer Characteristics

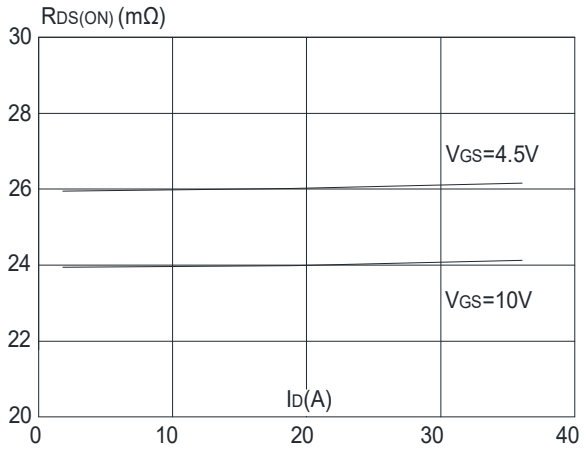


Figure 3: On-resistance vs. Drain Current

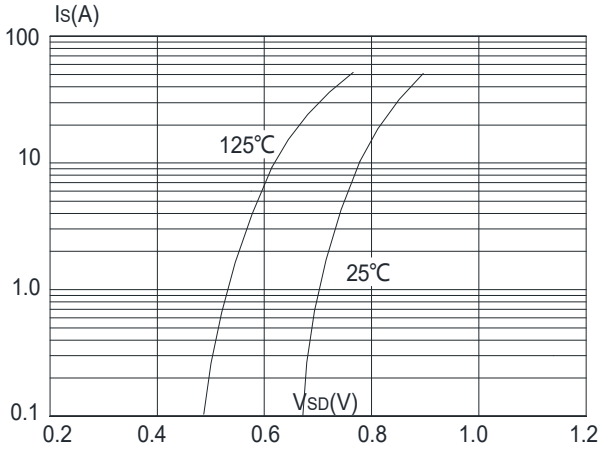


Figure 4: Body Diode Characteristics

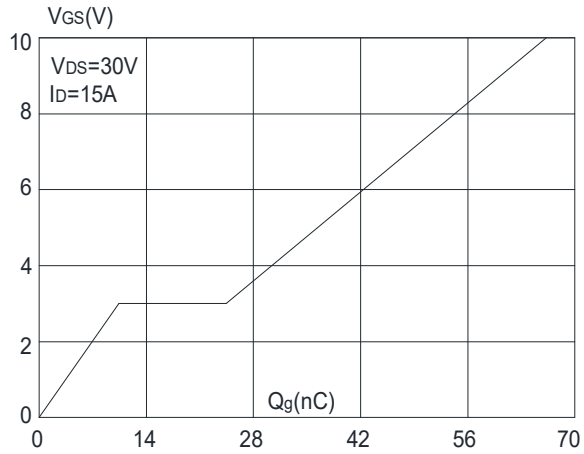


Figure 5: Gate Charge Characteristics

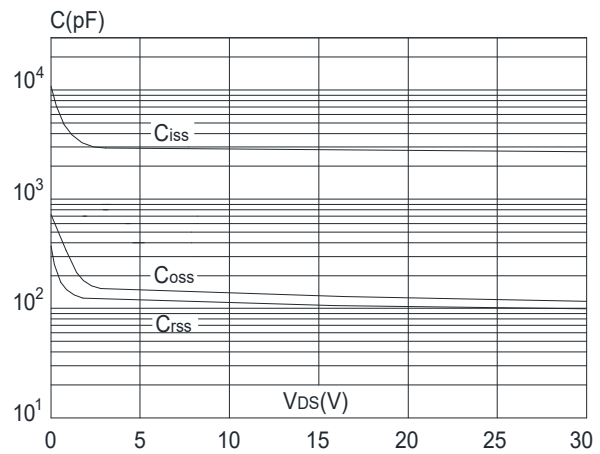


Figure 6: Capacitance Characteristics

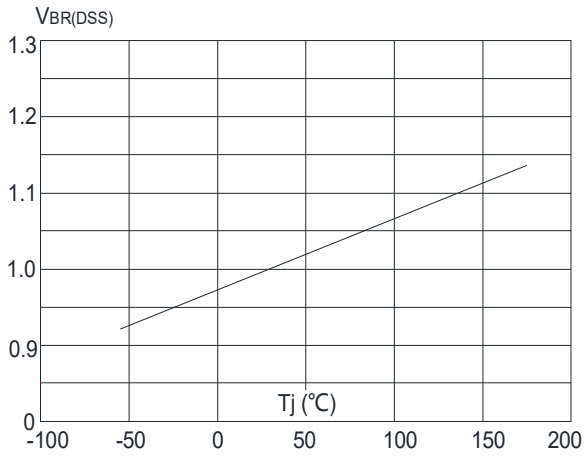


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

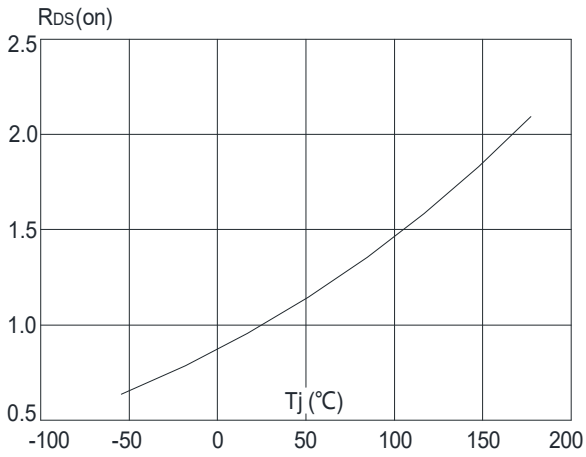


Figure 8: Normalized on Resistance vs. Junction Temperature

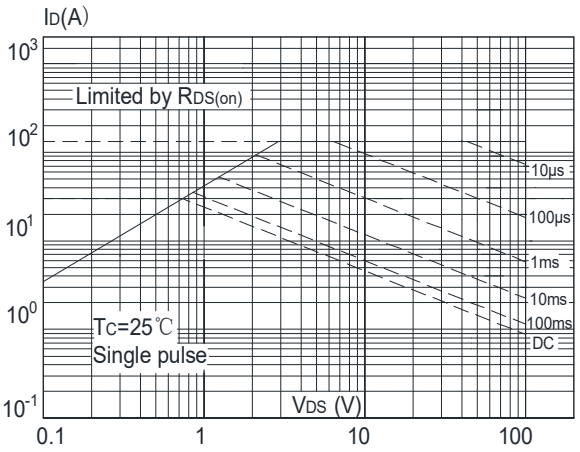


Figure 9: Maximum Safe Operating Area

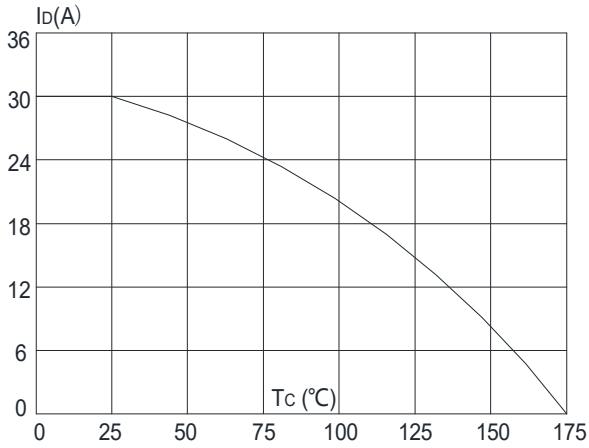


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

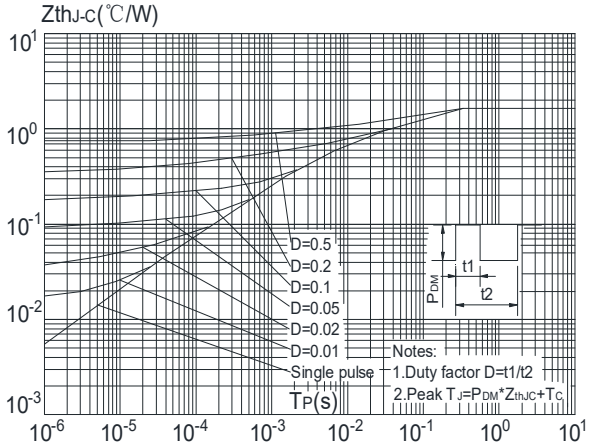
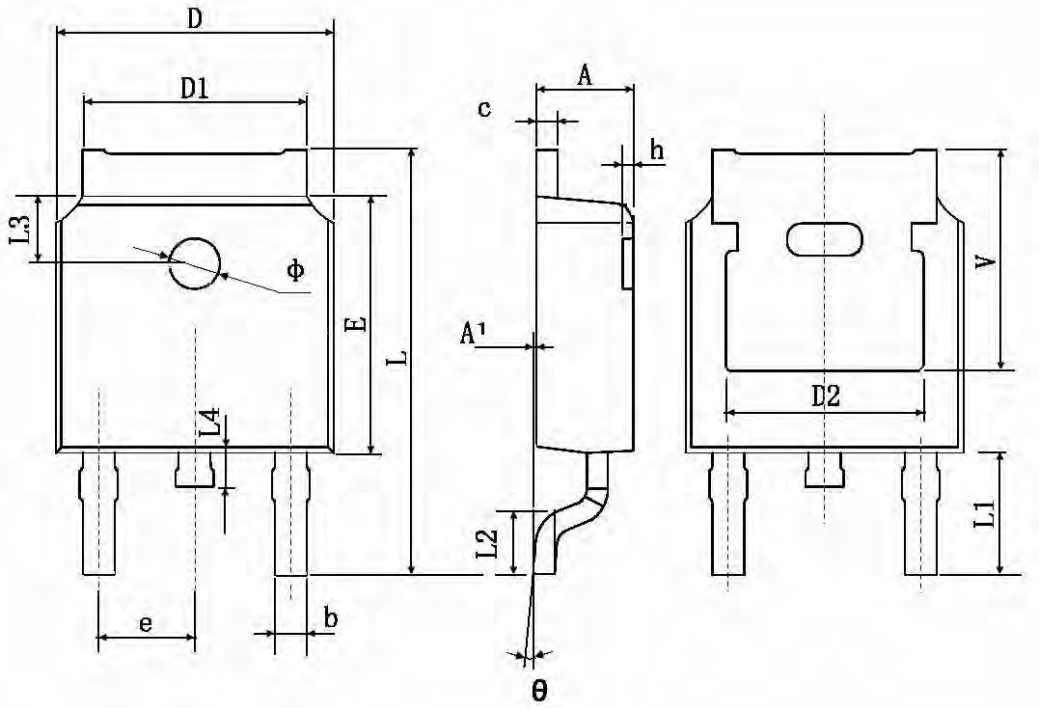


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case

TO-252-2L 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	0.483 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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