40V N-Channel Mosfet

FEATURES

- $R_{DS(ON)}$ ≤ 1.0mΩ (0.73mΩ Typ.) @V_{GS}=10V
- $R_{DS(ON)}$ ≤ 1.6mΩ (1.07mΩ Typ.) @V_{GS}=4.5V
- AEC Q101 qualified
- Green Product (RoHS compliant)
- 100% UIS TEST

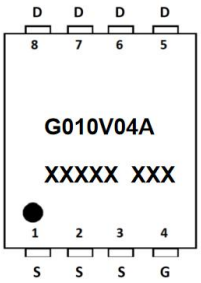
APPLICATIONS

- Automobile motor drive
- Load Switch

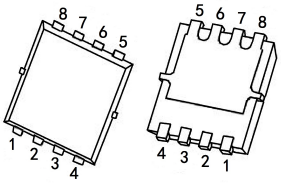
ŏ PWM Applications

ŏ Power Management

MARKING

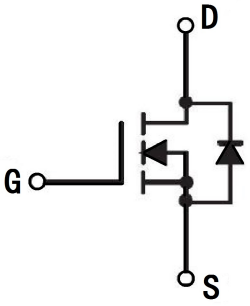


PDFN5*6-8L



1: S	3: S	5: D	7: D
2: S	4: G	6: D	8: D

N-CHANNEL MOSFET



MAXIMUM RATINGS (Tc=25°C unless otherwise noted)

Symbol	Parameter		Max.	Units
V_{DSS}	Drain-Source Voltage		40	V
V_{GSS}	Gate-Source Voltage		±20	V
I_D	Continuous Drain Current	T_C = 25℃	200	A
		T_C = 100℃	140	A
I_{DM}	Pulsed Drain Current note1		800	A
E_{AS}	Single Pulsed Avalanche Energy note2		420	mJ
P_D	Power Dissipation	T_C = 25℃	81	W
$R_{\theta JC}$	Thermal Resistance, Junction to Case		1.84	℃/W
T_J, T_{STG}	Operating and Storage Temperature Range		-55 to +175	℃

MOSFET ELECTRICAL CHARACTERISTICS Tc=25 °C unless otherwise specified

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
Off Characteristic						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=250μA	40	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=40V, 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	1.5	2.5	V
$R_{DS(on)}$	Static Drain-Source on-Resistance note3	V_{GS}=10V, I_D=30A	-	0.73	1.0	mΩ
		V_{GS}=4.5V, I_D=20A	-	1.07	1.6	mΩ
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{DS}=20V, V_{GS}=0V, f=1.0MHz	-	7400	-	pF
C_{oss}	Output Capacitance		-	1930	-	pF
C_{rss}	Reverse Transfer Capacitance		-	110	-	pF
Q_g	Total Gate Charge	V_{DS}=20V, I_D=85A, V_{GS}=10V	-	125	-	nC
Q_{gs}	Gate-Source Charge		-	18	-	nC
Q_{gd}	Gate-Drain(“Miller”) Charge		-	13	-	nC
Switching Characteristics						
$t_{d(on)}$	Turn-on Delay Time	V_{DD}=20V, I_D=85A, R_G=1.6Ω, V_{GS}=10V	-	14.1	-	ns
t_r	Turn-on Rise Time		-	7.9	-	ns
$t_{d(off)}$	Turn-off Delay Time		-	56.5	-	ns
t_f	Turn-off Fall Time		-	9.6	-	ns
Drain-Source Diode Characteristics and Maximum Ratings						
I_S	Maximum Continuous Drain to Source Diode Forward Current		-	-	200	A
I_{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	800	A
V_{SD}	Drain to Source Diode Forward Voltage	V_{GS}=0V, I_S=30A	-	-	1.2	V
t_{rr}	Body Diode Reverse Recovery Time	T_J=25℃, I_F=I_S,dI/dt=100A/μs	-	35	-	ns
Q_{rr}	Body Diode Reverse Recovery Charge		-	124	-	nC

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

2. EAS condition: T_J=25℃, V_{DD}=20V, V_G=10V, R_G=25Ω, L=0.5mH, I_{AS}= 41A

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

TYPICAL PERFORMANCE CHARACTERISTICS

Figure1: Output Characteristics

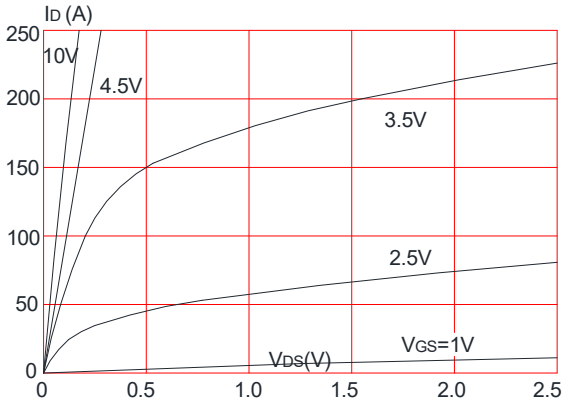


Figure 2: Typical Transfer Characteristics

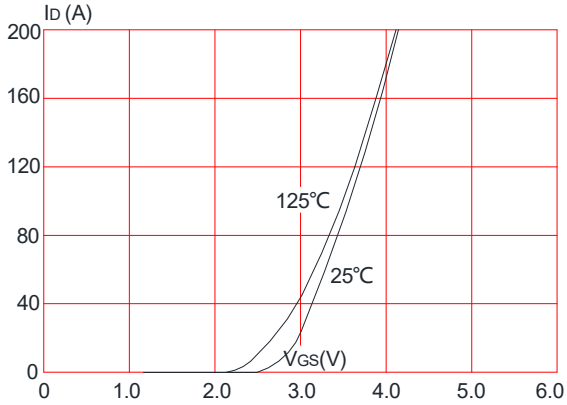


Figure 3: On-resistance vs. Drain Current

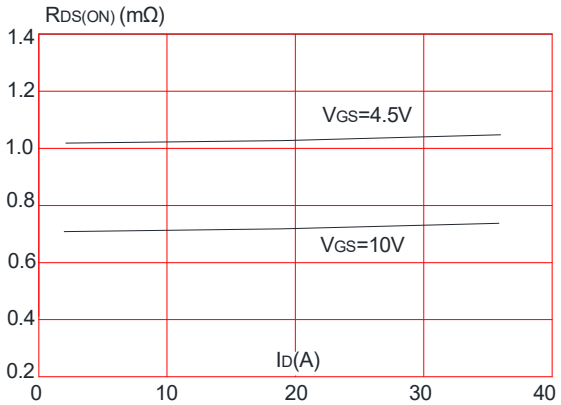


Figure 4: Body Diode Characteristics

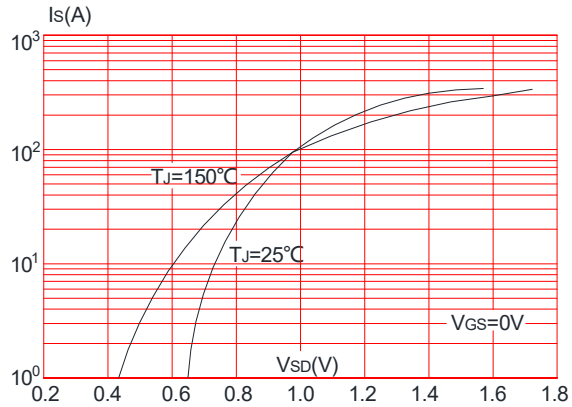


Figure 5: Gate Charge Characteristics

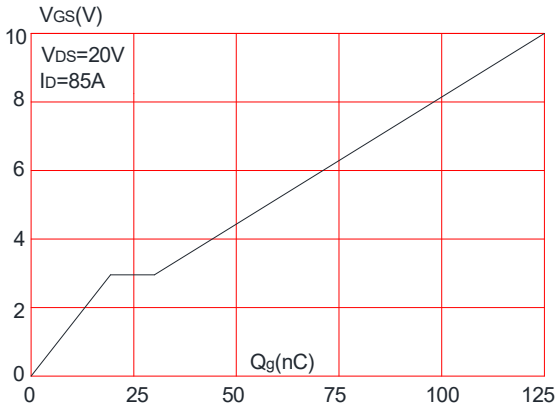
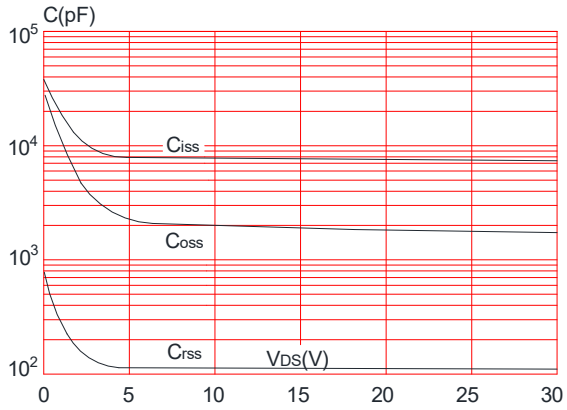


Figure 6: Capacitance Characteristics



TYPICAL PERFORMANCE CHARACTERISTICS (cont.)

Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

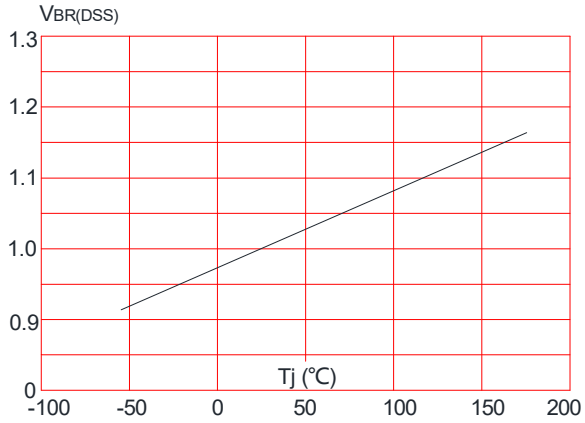


Figure 8: Normalized on Resistance vs. Junction Temperature

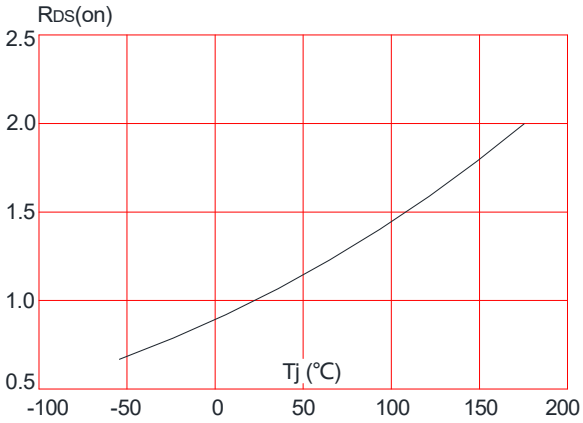


Figure 9: Maximum Safe Operating Area

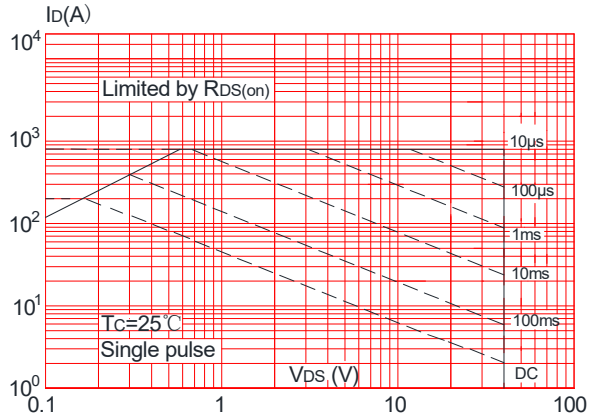


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

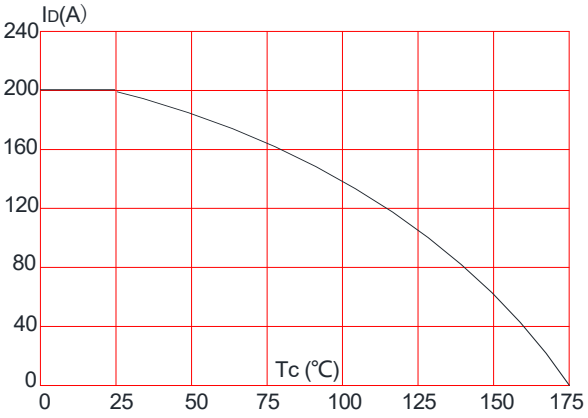
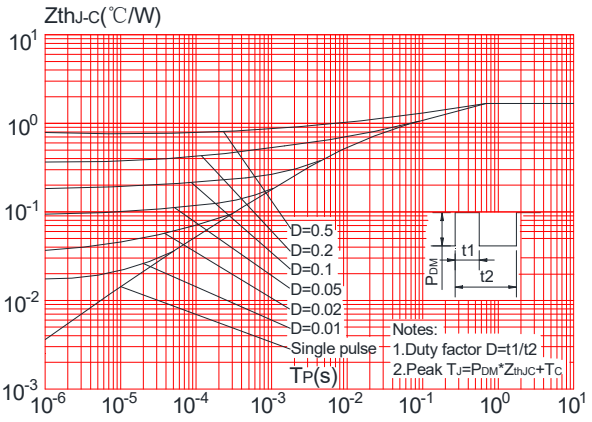
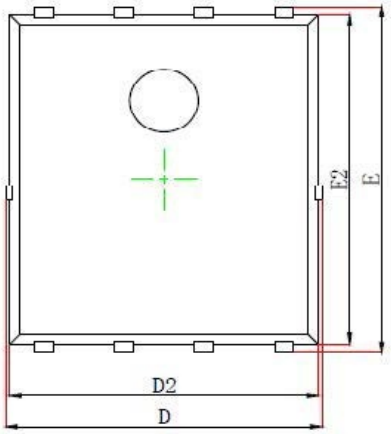


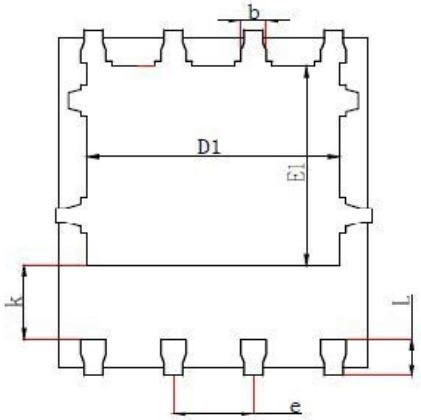
Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case



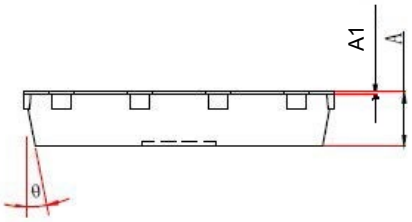
PDFN5*6-8L PACKAGE OUTLINE DRAWING



Top View
[顶视图]



Bottom View
[背视图]



Side View
[侧视图]

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.800	1.100	0.031	0.043
A1	0.000	0.05	0.000	0.002
D	-	5.4	-	0.212
E	-	6.250	-	0.246
D1	3.900	4.200	0.153	0.165
E1	3.350	3.650	0.132	0.144
D2	4.800	5.150	0.189	0.203
E2	5.500	5.950	0.216	0.234
k	1.100	1.500	0.043	0.059
b	0.250	0.510	0.010	0.020
e	1.170	1.370		
L	0.510	0.800	0.020	0.031
θ	6°	14°	6°	14°