TM09P02AF3

P-Channel Enhancement Mosfet

General Description
- Low $R_{DS(ON)}$
- RoHS and Halogen-Free Compliant

Applications
- Load switch
- PWM

General Features

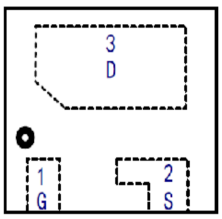
V_{DS} = -18 V I_D =-9.0 A

$R_{DS(ON)}$ = 16 mΩ (typ.) @ V_{GS}=-4.5V

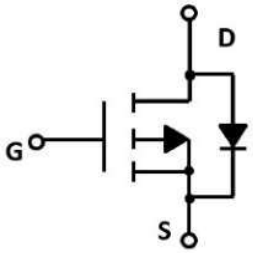
100% UIS Tested
100% R_g Tested

Green Product

AF3:DFN1.5x1.5-3L



Marking: 09P02



Absolute Maximum Ratings (T_A = 25°C Unless Otherwise Noted)

Symbol	Parameter		Max.	Units
V_{DSS}	Drain-Source Voltage		-18	V
V_{GSS}	Gate-Source Voltage		±12	V
I_D	Continuous Drain Current	T_A = 25℃	-9	A
		T_A = 100℃	-5.8	A
I_{DM}	Pulsed Drain Current note1		-33	A
P_D	Power Dissipation	T_A = 25℃	2.3	W
$R_{\theta JA}$	Thermal Resistance, Junction to Case		70	℃/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 Characteristic						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D= -250μA		-18	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}= -15V, V_{GS}=0V,	-	-	-1	μA
I_{GSS}	Gate to Body Leakage Current	V_{DS}=0V, V_{GS}= ±12V	-	-	±100	nA
On Characteristics						
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D= -250μA	-0.4	-0.7	-1.0	V
$R_{DS(on)}$	Static Drain-Source on-Resistance note2	V_{GS}= -4.5V, I_D= -7A	-	16	20	mΩ
		V_{GS}= -2.5V, I_D= -5A	-	21	25	
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{DS}= -10V, V_{GS}=0V, f=1.0MHz	-	1800	-	pF
C_{oss}	Output Capacitance		-	242	-	pF
C_{rss}	Reverse Transfer Capacitance		-	231	-	pF
Q_g	Total Gate Charge	V_{DS}= -10V, I_D= -3A, V_{GS}= -4.5V	-	15.3	-	nC
Q_{gs}	Gate-Source Charge		-	2.2	-	nC
Q_{gd}	Gate-Drain(“Miller”) Charge		-	4.4	-	nC
Switching Characteristics						
$t_{d(on)}$	Turn-on Delay Time	V_{DD} = -10V, I_D= -7A, V_{GS}= -4.5V, R_{GEN}=2.5Ω	-	10	-	ns
t_r	Turn-on Rise Time		-	31	-	ns
$t_{d(off)}$	Turn-off Delay Time		-	28	-	ns
t_f	Turn-off Fall Time		-	8	-	ns
Drain-Source Diode Characteristics and Maximum Ratings						
I_S	Maximum Continuous Drain to Source Diode Forward Current		-	-	-9	A
I_{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	-33	A
V_{SD}	Drain to Source Diode Forward Voltage	V_{GS}=0V, I_S= -7A	-	-0.8	-1.2	V

Notes:1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature
2. Pulse Test: Pulse Width≤300μs, Duty Cycle≤2%

Typical Performance Characteristics

Figure1: Output Characteristics

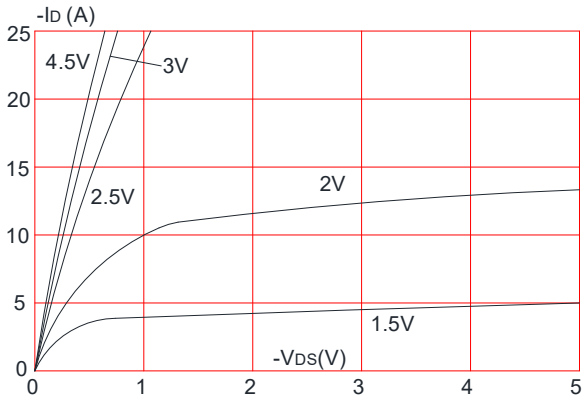


Figure 2: Typical Transfer Characteristics

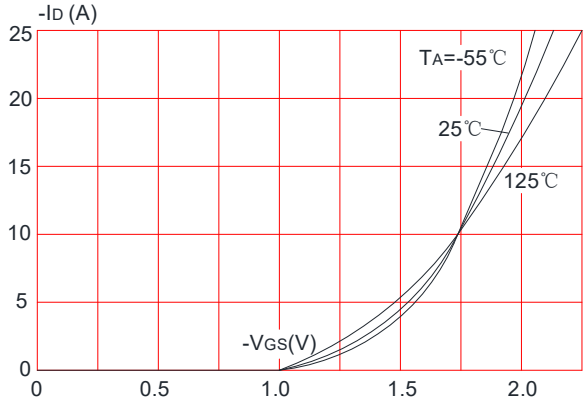


Figure 3: On-resistance vs. Drain Current

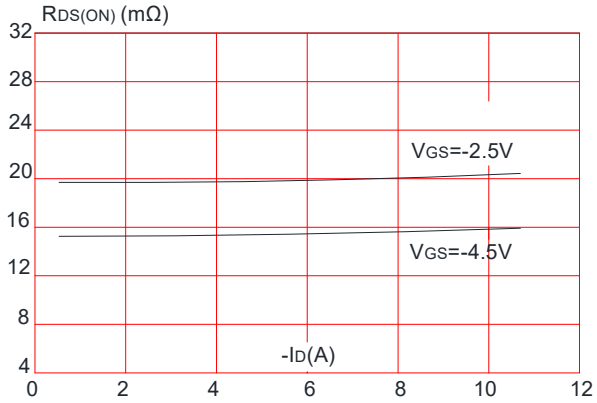


Figure 4: Body Diode Characteristics

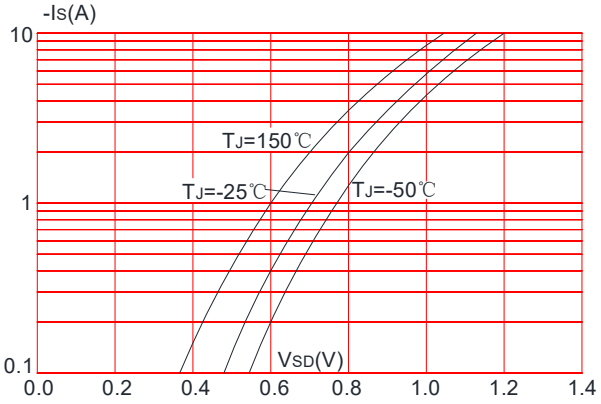


Figure 5: Gate Charge Characteristics

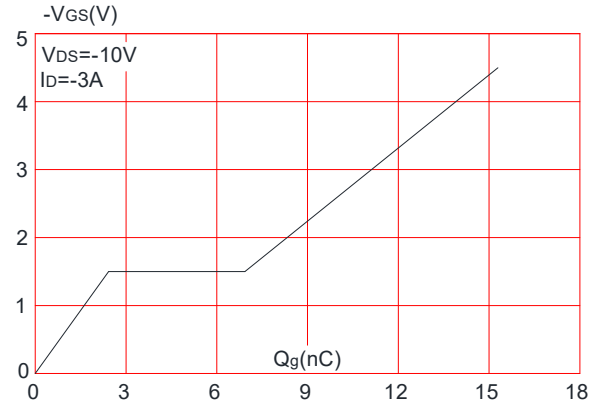


Figure 6: Capacitance Characteristics

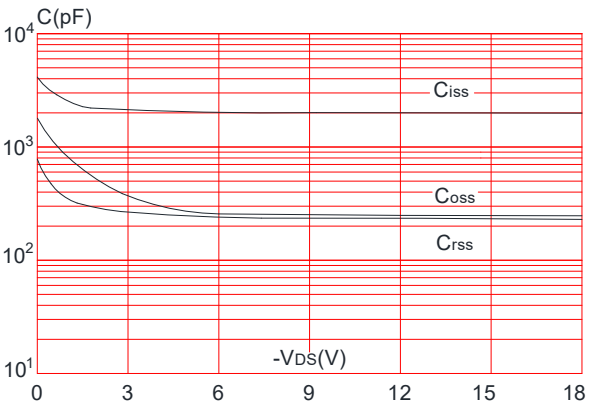


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

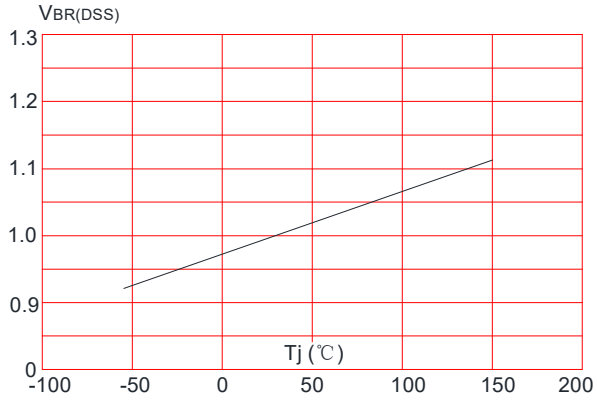


Figure 8: Normalized on Resistance vs. Junction Temperature

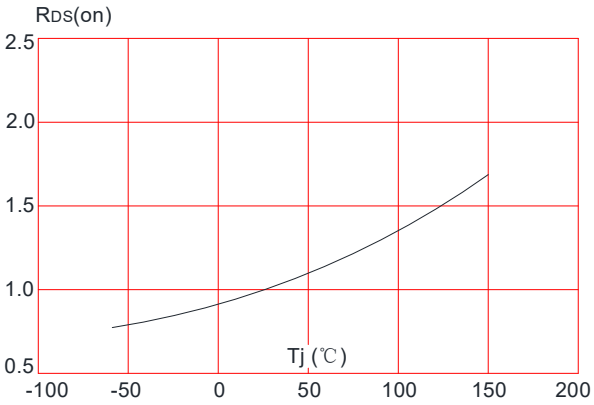


Figure 9: Maximum Safe Operating Area

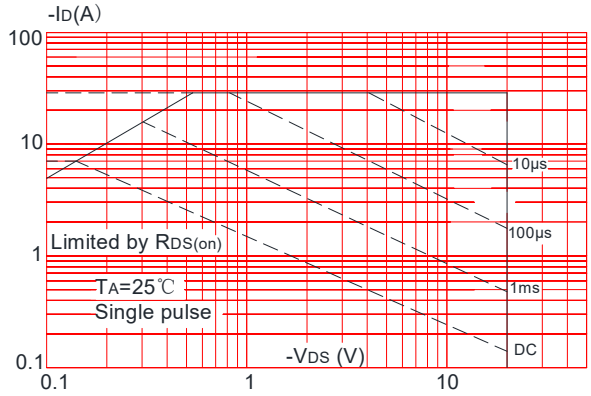


Figure 10: Maximum Continuous Drain Current vs. Ambient Temperature

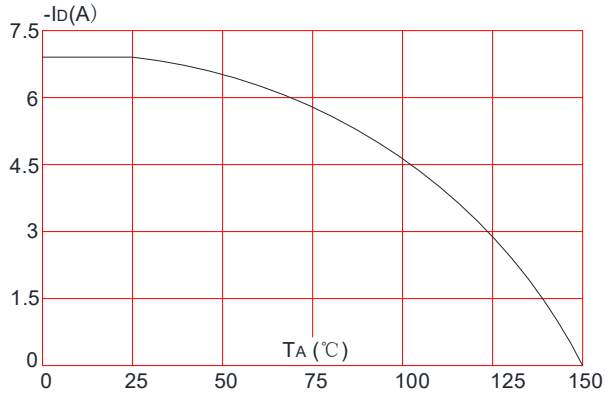
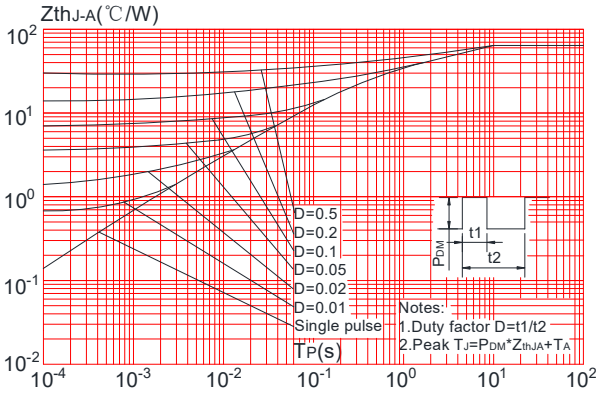
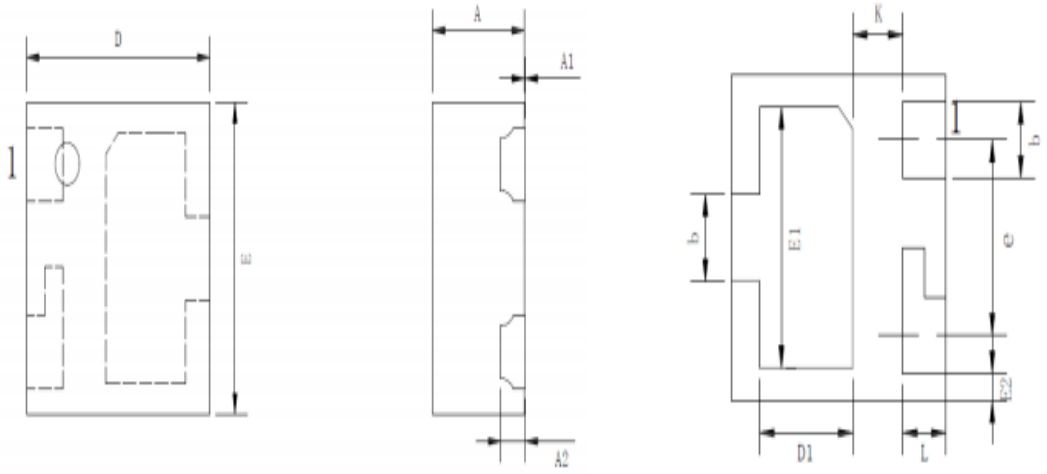


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Ambient



Package Information:DFN1.5x1.5-3L



SYMBOL	MILLMETER		
	MIN	NOM	MAX
A	—	—	0.80
A1	0.00	—	0.05
A2	0.203 TIY		
b	0.30	0.35	0.40
D	1.45	1.50	1.55
D1	0.60	0.65	0.70
E	1.45	1.50	1.55
E1	1.15	1.20	1.25
E2	0.125 TIY		
e	0.90 BSC		
K	0.35 BSC		
L	0.25	0.30	0.35