N-Channel 20V(D-S) MOSFET

Product summary		
V_{DS}	20	V
$R_{DS(ON)}$(at V_{GS}=4.5V) Typ.	190	mΩ
$R_{DS(ON)}$(at V_{GS}=2.5V) Typ.	240	mΩ
I_D(T_A=25℃)	0.7	A

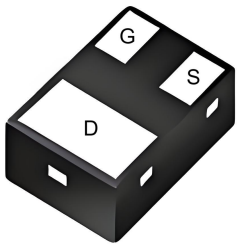
Features

- Low Threshold Voltage
- ESD protection up to 2 kV
- Small package DFN1006-3L

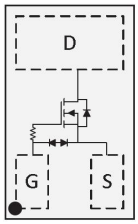
Applications

- Small Signal Switching
- Small Moto Driver

Pin Configuration



DFN1006-3L



Packing Information

Device	Package	Reel Size	Quantity(Min. Package)
ECAD2004	DFN1006-3L	7″	10000pcs

Absolute Maximum Ratings (at T_A=25℃ Unless Otherwise Noted)

Symbol	Parameter		Rating	Units
V_{DS}	Drain-Source Voltage		20	V
V_{GS}	Gate-Source Voltage		±8	V
I_D	Continuous Drain Current [A C]	T_A=25℃	0.70	A
		T_A=70℃	0.56	A
I_{DM}	Pulse Drain Current Tested [B]		2.9	A
P_D	Power Dissipation [A C]	T_A=25℃	0.3	W
T_J,T_{STG}	Junciton and Storage Temperature Range		-55 to +150	℃

Thermal Characteristics

Symbol	Parameter	Typical	Units
$R_{\theta JA}$	Thermal Resistance-Junction to ambient [A]	416	℃/W

Electrical Characteristics (at T_J =25℃ Unless Otherwise Noted)

Symbol	Parameter	Condition	Min.	Typ.	Max.	Units
Static Parameters						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V,I_D=250uA	20	--	--	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=20V,V_{GS}=0V	--	--	1	uA
I_{GSS}	Gate-Body Leakage Current	V_{DS}=0V,V_{GS}=±8V	--	--	±10	uA
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS},I_D=250uA	0.5	--	1.0	V
$R_{DS(ON)}$	Drain-Source On-State Resistance [D]	V_{GS}=4.5V,I_D=0.5A	--	190	280	mΩ
		V_{GS}=2.5V,I_D=0.5A	--	240	350	mΩ
		V_{GS}=1.8V,I_D=0.5A	--	310	450	mΩ
V_{SD}	Forward Voltage	I_{SD}=0.5A,V_{GS}=0V	--	--	1.3	V
Dynamic Parameters						
C_{iss}	Input Capacitance	V_{GS}=0V,V_{DS}=10V f=1MHZ	--	46	--	pF
C_{oss}	Output Capacitance		--	9.8	--	pF
C_{rss}	Reverse Transfer Capacitance		--	7.2	--	pF
Switching Parameters						
Q_g	Total Gate Charge	V_{DS}=10V,I_D=0.5A V_{GS}=4.5V	--	1.8	--	nC
Q_{gs}	Gate-Source Charge		--	0.15	--	nC
Q_{gd}	Gate-Drain Charge		--	0.25	--	nC
$t_{D(on)}$	Turn-on Delay Time	V_{DS}=10V I_D=0.5A, V_{GS}=4.5V,R_{GEN}=6Ω	--	34	--	ns
t_r	Turn-on Rise Time		--	97.3	--	ns
$t_{D(off)}$	Turn-off Delay Time		--	601	--	ns
t_f	Turn-off Fall Time		--	312	--	ns

A. Device mounted on FR-4 PCB, 1 inch x 1 inch x 0.062 inch.

B. Pulse width<380us, Single pulse

C. Maximum junction temperature T_J=150℃.

D. Pulse test: Pulse width <380us duty cycle <2%.

Typical Characteristics

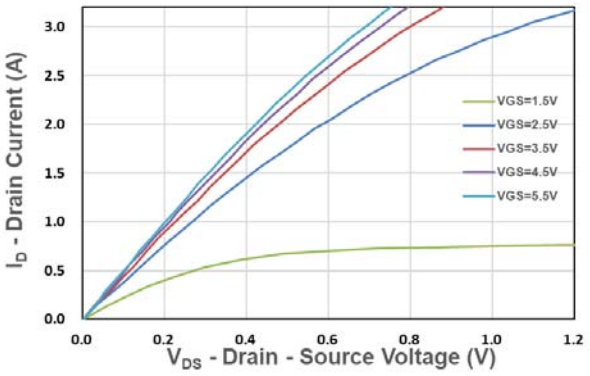


Figure 1. Output Characteristics

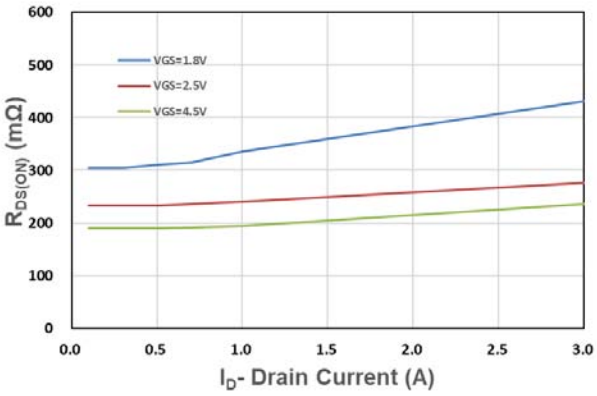


Figure 2. On−Resistance vs. I_D

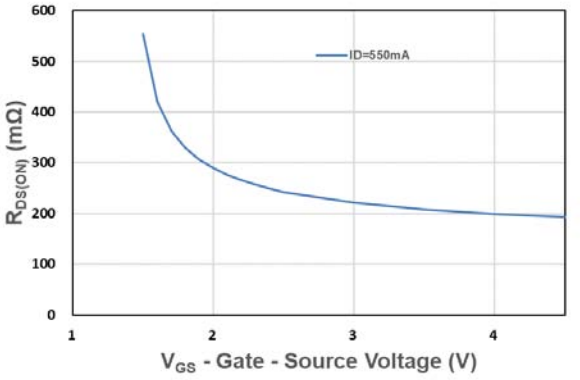


Figure 3. On−Resistance vs. V_{GS}

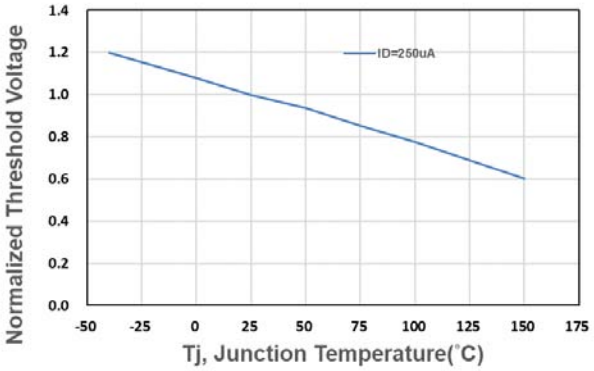


Figure 4. Gate Threshold Voltage

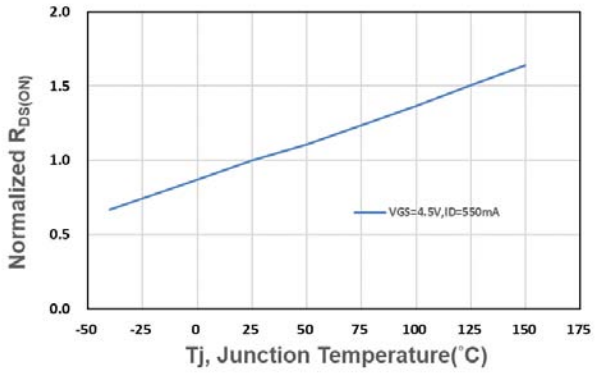


Figure 5. Drain-Source On Resistance

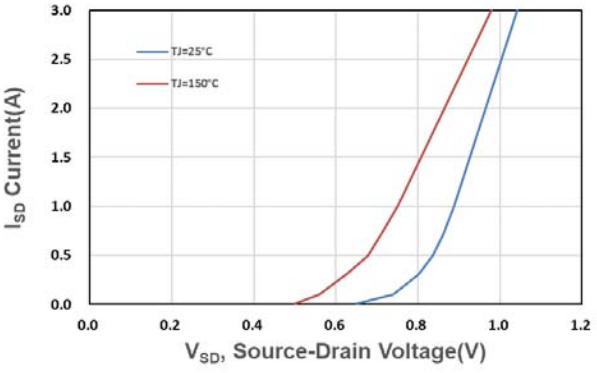


Figure 6. Source-Drain Diode Forward

Typical Characteristics

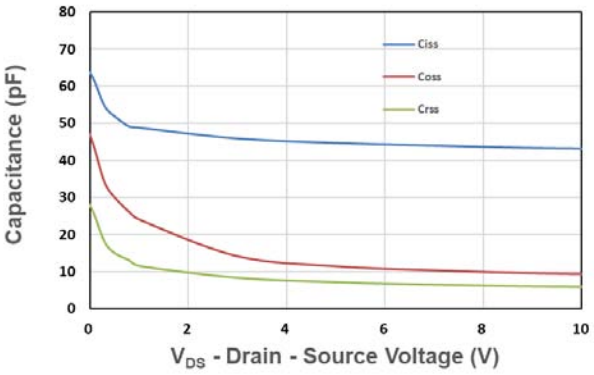


Figure 7. Capacitance

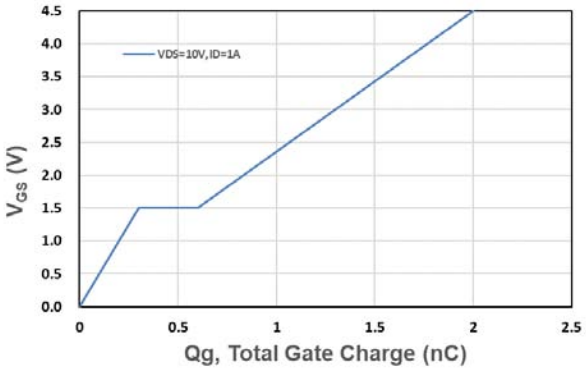


Figure 8. Gate Charge Characteristics

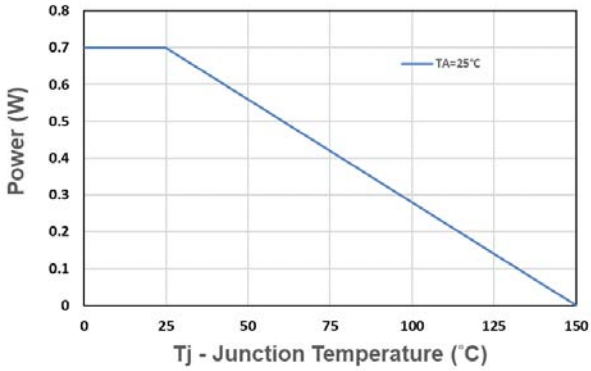


Figure 9. Power Dissipation

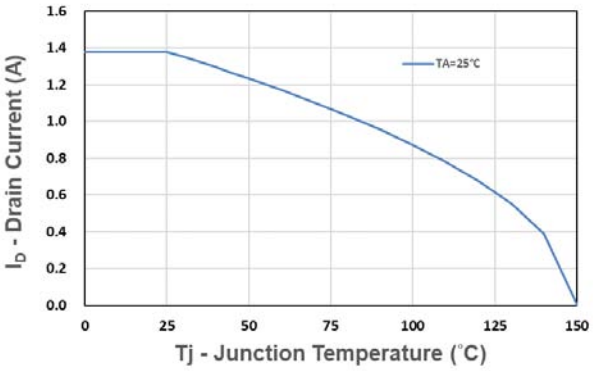


Figure 10. Drain Current

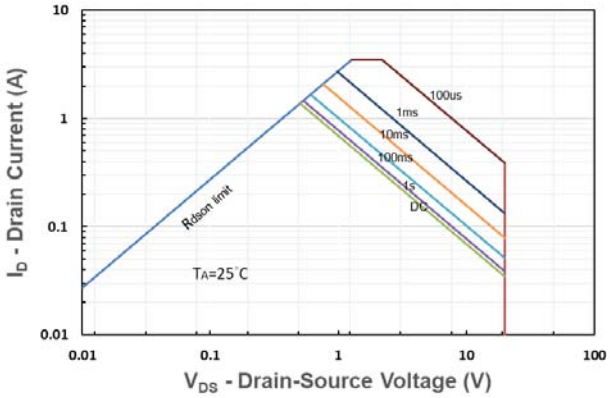


Figure 11. Safe Operating Area

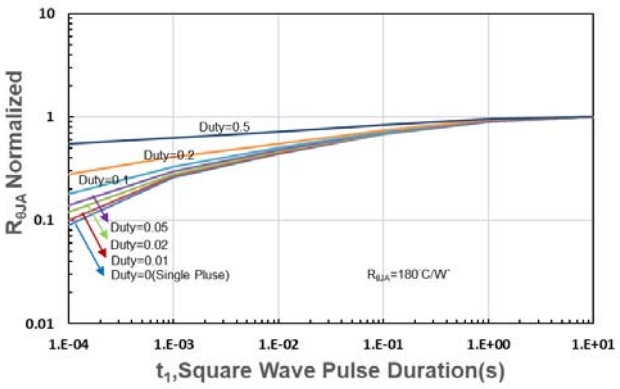
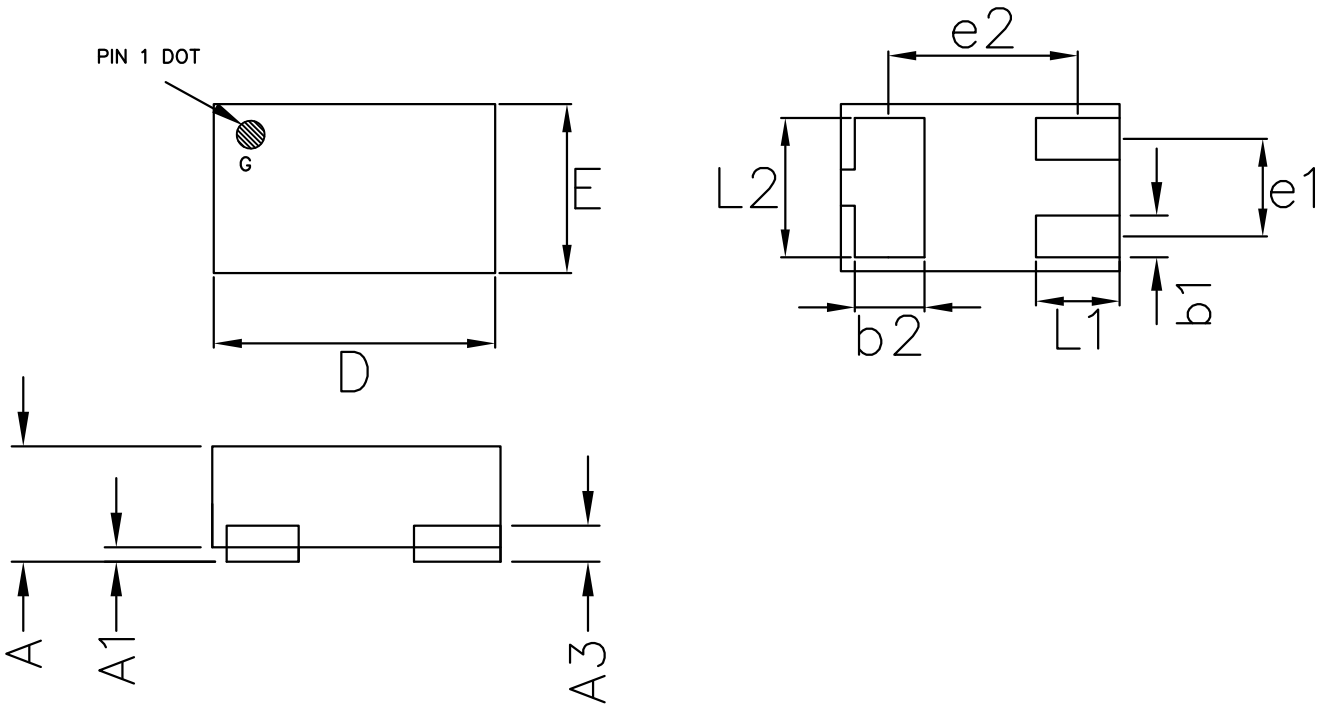


Figure 12. $R_{\theta JA}$ Transient Thermal Impedance

DFN1006-3L Package Information



COMMON DIMENSIONS(MM)			
PKG.	X1: EXTREME THIN		
REF.	MIN.	NOM.	MAX
A	>0.40	—	0.55
A1	0.00	—	0.05
A3	0.125 REF.		
D	0.95	1.00	1.05
E	0.55	0.60	0.65
b1	0.10	0.15	0.20
b2	0.20	0.25	0.30
L1	0.20	0.30	0.40
L2	0.40	0.50	0.60
e1	0.35 BSC		
e2	0.675 BSC		