

P-Channel Enhancement MOSFET

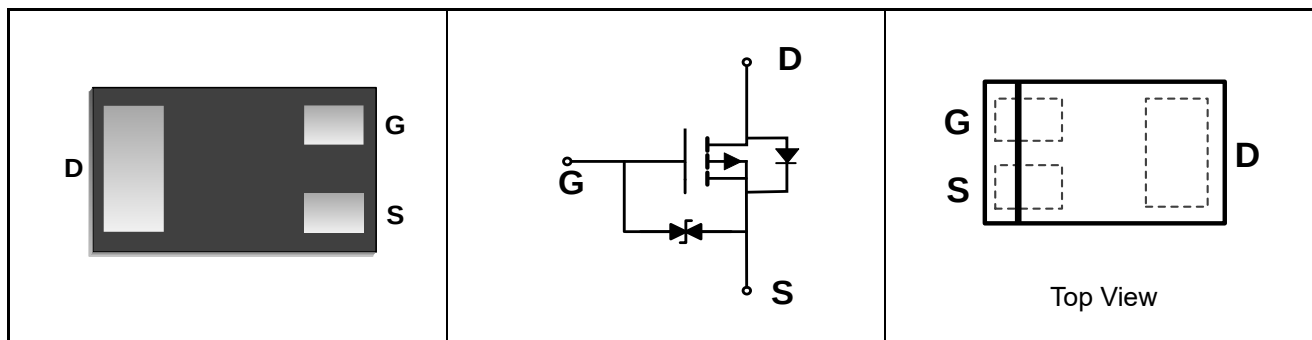
Features

- Small Signal MOSFET
- $V_{DS} = -20V$, $I_D = -0.66A$
 - $R_{DS(on)} < 520m\Omega$ @ $V_{GS} = -4.5V$
 - $R_{DS(on)} < 780m\Omega$ @ $V_{GS} = -2.5V$
- Trench LV MOSFET Technology
- ESD Protected

Mechanical Characteristics

- DFN1006-3L Package
- Marking : Making Code
- RoHS Compliant

Schematic & PIN Configuration



Absolute Maximum Ratings ($T_A = 25^\circ C$, unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	-20	V
Gate-Source Voltage	V_{GS}	± 10	V
Continuous Drain Current	I_D	-0.66	A
Pulsed Drain Current ⁽¹⁾	I_{DM}	-2.6	A
Power Dissipation ⁽¹⁾	P_D	300	mW
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 to 150	$^\circ C$
Thermal Resistance from Junction to Ambient ⁽²⁾	$R_{\theta JA}$	416	$^\circ C/W$
Thermal Resistance from Junction to Case	$R_{\theta JC}$	505	$^\circ C/W$

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	B _{VDSS}	V _{GS} = 0V, I _D = -250μA	-20	-	-	V
Gate-body Leakage Current	I _{GSS}	V _{DS} = 0V, V _{GS} = ±10V	-	-	±20	μA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = -20V, V _{GS} = 0V	-	-	-1	μA
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = -250μA	-0.3	-0.6	-1.1	V
Drain-Source On-state Resistance ⁽³⁾	R _{DS(on)}	V _{GS} = -4.5V, I _D = -0.66A	-	450	520	mΩ
		V _{GS} = -2.5V, I _D = -0.6A	-	650	780	
		V _{GS} = -1.8V, I _D = -0.5A	-	950	-	
Dynamic Characteristics ⁽⁴⁾						
Input Capacitance	C _{iss}	V _{GS} = 0V, V _{DS} = -10V, f = 1MHz	-	76	-	pF
Output Capacitance	C _{oss}		-	12	-	
Reverse Transfer Capacitance	C _{rss}		-	9	-	
Switching Characteristics ⁽⁴⁾						
Turn-On Delay Time	t _{d(on)}	V _{GS} = -4.5V, V _{DS} = -10V, I _D = -0.66A, R _G =3Ω	-	9	-	ns
Turn-On Rise Time	t _r		-	5.7	-	
Turn-Off Delay Time	t _{d(off)}		-	32.6	-	
Turn- Off Fall Time	t _f		-	20.3	-	
Source-Drain Diode Characteristics						
Body Diode Voltage ⁽³⁾	V _{SD}	I _S = -0.66A, V _{GS} = 0V	-	-	-1.2	V
Continuous Source Current	I _S		-	-	-0.66	A

Note1. Repetitive rating, pulse width limited by junction temperature $T_{J(MAX)} = 150^{\circ}\text{C}$.

Note2. The data tested by surface mounted on a 1 inch² FR-4 board with 20Z copper, The value in any given application depends on the user's specific board design.

Note3. Pulse Test: Pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.

Note4. This value is guaranteed by design hence it is not included in the production test.

Typical Characteristics

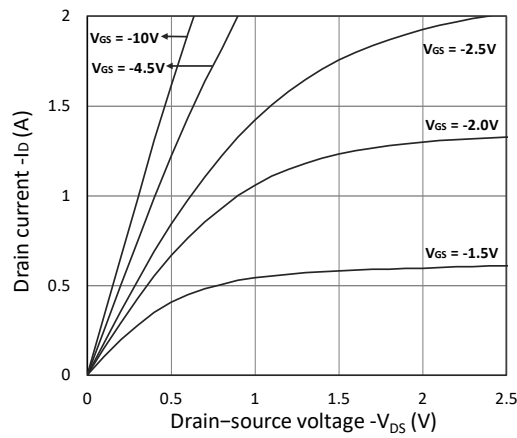


Figure 1. Output Characteristics

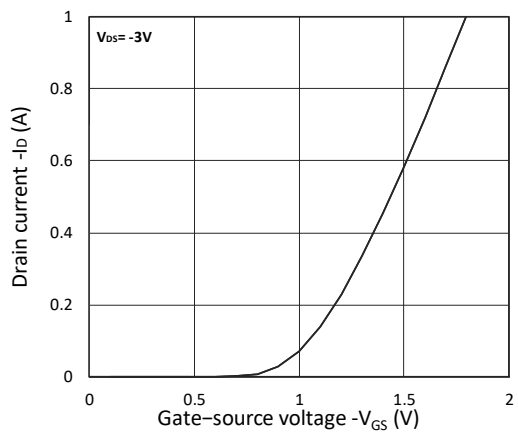


Figure 2. Transfer Characteristics

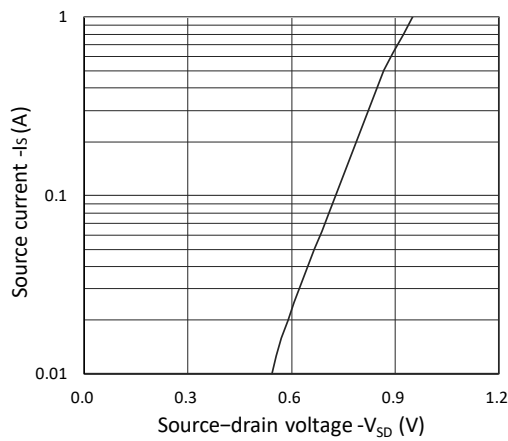


Figure 3. Forward Characteristics of Reverse

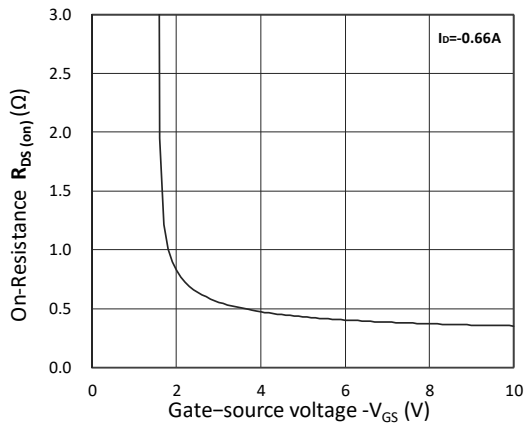


Figure 4. $R_{DS(ON)}$ vs. V_{GS}

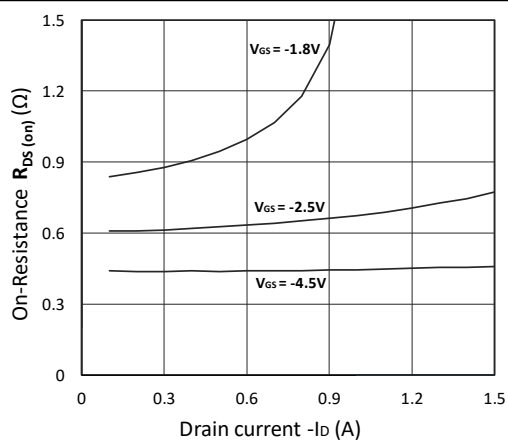


Figure 5. $R_{DS(ON)}$ vs. I_D

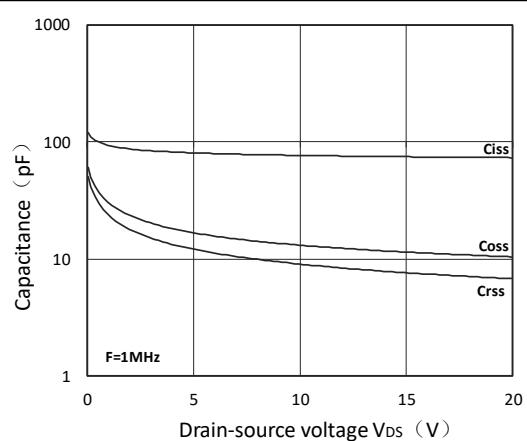


Figure 6. Capacitance Characteristics

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Package Dimension

DFN1006-3L

Package Outline

Technical drawing of a package outline showing three views: TOP VIEW, BOTTOM VIEW, and a side view. The TOP VIEW shows a rectangular package with dimensions D (total width) and E (total height). The BOTTOM VIEW shows the internal layout with dimensions e (inner width), b (inner height), b1 (inner height offset), and E1 (inner height offset). The side view shows the package height A and the mounting pad height A1.

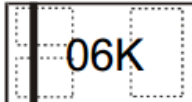
COMMON DIMENSIONS

SYM BOL	MILLIMETER		INCHES	
	MIN	MAX	MIN	MAX
A	0.45	0.55	0.018	0.022
A1	0.00	0.05	0.000	0.002
b	0.40	0.60	0.016	0.024
b1	0.10	0.20	0.004	0.008
D	0.95	1.05	0.037	0.041
e	0.65BSC		0.026BSC	
E	0.55	0.65	0.022	0.026
E1	0.19BSC		0.007BSC	
L	0.20	0.30	0.008	0.012

Recommended Land Pattern

Technical drawing of the recommended land pattern showing two views: a top view and a side view. The top view shows a rectangular land pattern with dimensions 1.10 (total width), 0.70 (inner width), 0.55 (inner height), and 0.40 (inner width offset). The side view shows the land pattern height 0.20 and the mounting pad height 0.40.

Ordering Information

Part	Package	Marking	Packing Information
EM02P06FM	DFN1006-3L		10k/Reel

EM02P06FM

Revision History and Checking Table

Version	Date	Revision Item	Modifier	Function & Spec Checking	Package & Tape Checking
1.0	2018-08-14	Released Version	Liu Jia Ying	Qi Shu Kun	Liu Jia Ying
1.1	2022-12-28	Update Typeset	Yin Peng	Qi Shu Kun	Liu Jia Ying