杰力科技股份有限公司
Excelliance MOS Corporation

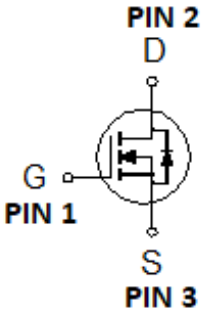
EMF30N02JS

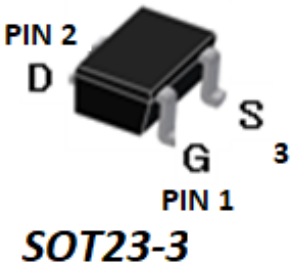
Single N-Channel Logic Level Enhancement Mode Field Effect Transistor

▪Product Summary:

	N-CH
BV_{DSS}	20V
$R_{DSON\ (MAX.)}$@V_{GS}=4.5V	30mΩ
$R_{DSON\ (MAX.)}$@V_{GS}=2.5V	51mΩ
$R_{DSON\ (MAX.)}$@V_{GS}=1.8V	80mΩ
I_D @T_A=25°C	4.0A

▪ Pin Description:





SOT23-3

Single N Channel MOSFET
Rg 100% Tested
RoHS & Halogen Free & TSCA Compliant

▪ ABSOLUTE MAXIMUM RATINGS (T_A = 25 °C Unless Otherwise Noted)

PARAMETERS/TEST CONDITIONS		SYMBOL	LIMITS	UNIT
Gate-Source Voltage		V_{GS}	±12	V
Continuous Drain Current	T_C = 25 °C	I_D	8	A
	T_C = 100 °C		5	
Continuous Drain Current	T_A = 25 °C	I_D	4	
	T_A = 70 °C		3	
Pulsed Drain Current[1]		I_{DM}	32	
Power Dissipation	T_C = 25 °C	P_D	3.3	W
	T_C = 100 °C		1.3	
Power Dissipation	T_A = 25 °C	P_D	1.0	
	T_A = 70 °C		0.7	
Operating Junction & Storage Temperature Range		T_j, T_{stg}	-55 to 150	°C

▪THERMAL RESISTANCE RATINGS

THERMAL RESISTANCE		SYMBOL	TYPICAL	MAXIMUM	UNIT
Junction-to-Case		$R_{\theta JC}$		38	°C/W
Junction-to-Ambient[3]	t≦10s	$R_{\theta JA}$		90	
	Steady-State	$R_{\theta JA}$		123	

[1]Pulse width limited by maximum junction temperature.

[2]Duty cycle < 1%

[3]The value of $R_{\theta JA}$ is measured with the device mounted on 1in^2 FR-4 board with 2oz. Copper, in a still air environment with T_A =25°C.

[4]Guarantee by Engineering test.

▪ ELECTRICAL CHARACTERISTICS (T_J = 25 °C, Unless Otherwise Noted)

PARAMETER	SYMBOL	TEST CONDITIONS	LIMITS			UNIT
			MIN	TYP	MAX	
STATIC						
Drain-Source Breakdown Voltage[4]	$V_{(BR)DSS}$	V_{GS} = 0V, I_D = 250μA	20			V
Gate Threshold Voltage[4]	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250μA	0.45	0.75	1.2	V
Gate-Body Leakage[4]	I_{GSS}	V_{DS} = 0V, V_{GS} = ±12V			±100	nA
Zero Gate Voltage Drain Current[4]	I_{DSS}	V_{DS} = 20V, V_{GS} = 0V			1	μA
		V_{DS} =20V, V_{GS} =0V, T_J = 125 °C			25	
On-State Drain Current[1]	$I_{D(ON)}$	V_{DS} = 5V, V_{GS} = 4.5V	4			A
Drain-Source On-State Resistance[1,4]	$R_{DS(ON)}$	V_{GS} = 4.5V, I_D = 5A		25	30	mΩ
		V_{GS} = 2.5V, I_D = 4A		32	51	
		V_{GS} = 1.8V, I_D = 2A		42	80	
Forward Transconductance[1]	g_{fs}	V_{DS} = 5V, I_D = 6A		20		S
DYNAMIC						
Input Capacitance[5]	C_{iss}	V_{GS} = 0V, V_{DS} = 10V, f = 1MHz		500		pF
Output Capacitance[5]	C_{oss}			85		
Reverse Transfer Capacitance[5]	C_{rss}			70		
Gate Resistance[4,5]	R_g	f = 1MHz		1.4		Ω
Total Gate Charge[1,2,5]	Q_g	V_{DS} = 10V, V_{GS} = 4.5V, I_D = 5A		7.5		nC
Gate-Source Charge[1,2,5]	Q_{gs}			1.5		
Gate-Drain Charge[1,2,5]	Q_{gd}			2.5		
Turn-On Delay Time[1,2,5]	$t_{d(on)}$	V_{DS} = 10V, V_{GS} = 4.5V, I_D = 5A , Rg = 3Ω		6.0		nS
Rise Time[1,2,5]	t_r			20		
Turn-Off Delay Time[1,2,5]	$t_{d(off)}$			23		
Fall Time[1,2,5]	t_f			23		
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS						
Continuous Current	I_S				2.8	A
Pulsed Current[3]	I_{SM}				32	
Forward Voltage[1,4]	V_{SD}	I_F = 5A, V_{GS} = 0V			1.2	V
Reverse Recovery Time[5]	t_{rr}	I_F = 5A, dI_F/dt = 100A / μS		12		nS
Peak Reverse Recovery Current[5]	$I_{RM(REC)}$			0.5		A
Reverse Recovery Charge[5]	Q_{rr}			5.1		nC

[1]Pulse test : Pulse Width ≦ 300 usec, Duty Cycle ≦ 2%.

[2]Independent of operating temperature.

[3]Pulse width limited by maximum junction temperature.

[4]Guarantee by FT test Item

[5]Guarantee by Engineering test

EMC will review datasheet by quarter, and update new version.

▪TYPICAL CHARACTERISTICS

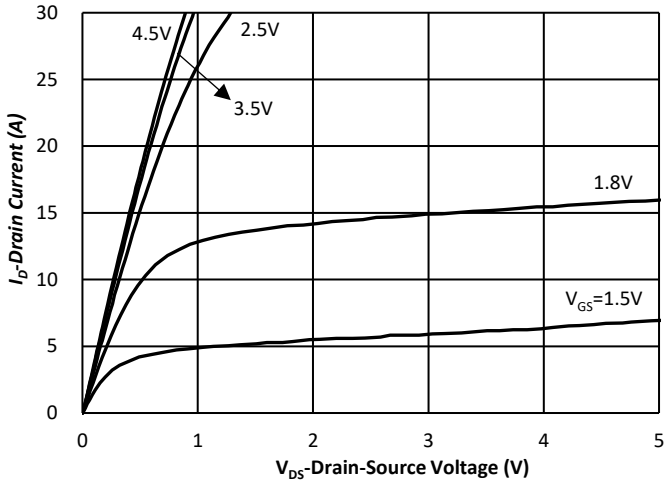


Fig.1 Typical Output Characteristics

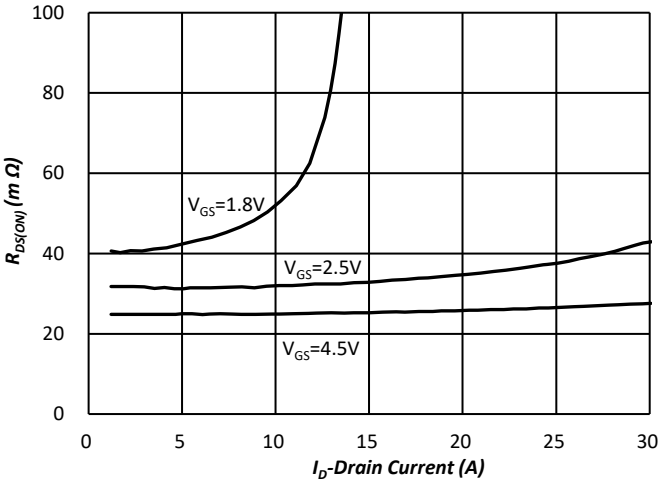


Fig.2 On-Resistance Variation with Drain Current and Gate Voltage

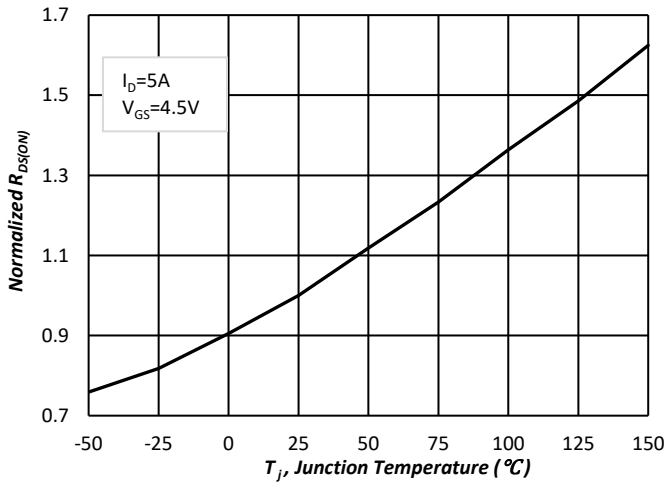


Fig.3 Normalized On-Resistance v.s. Junction Temperature

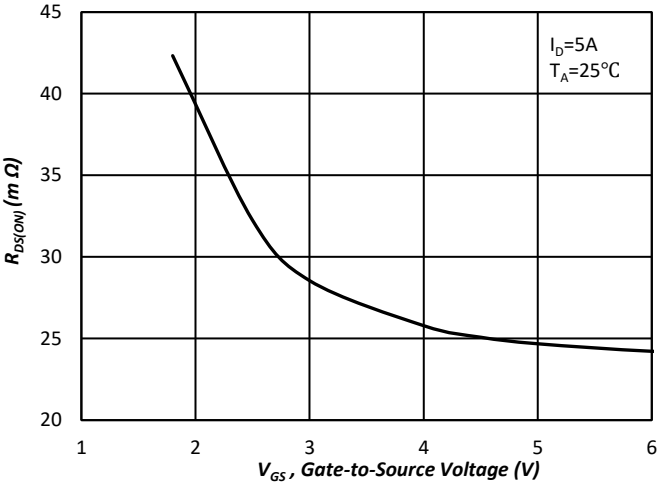


Fig.4 On-Resistance v.s. Gate Voltage

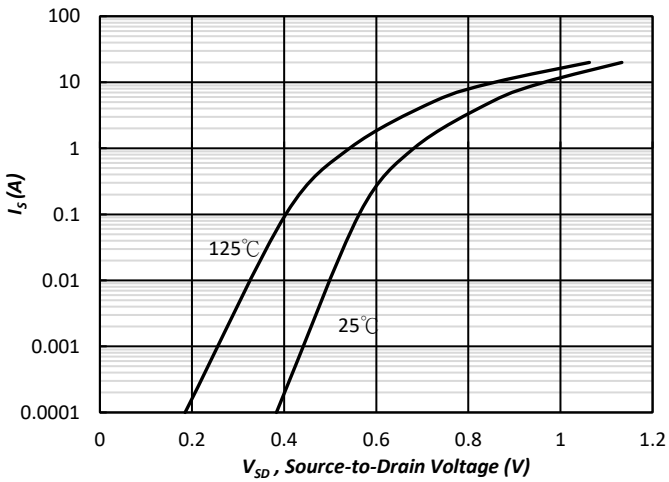


Fig.5 Forward Characteristic of Reverse Diode

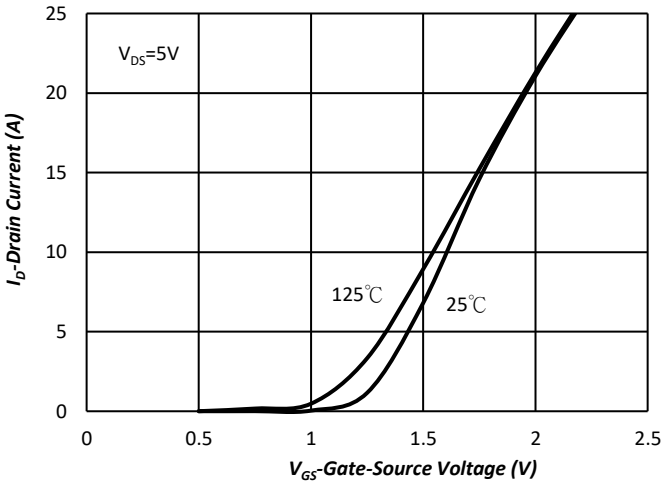


Fig.6 Transfer Characteristics

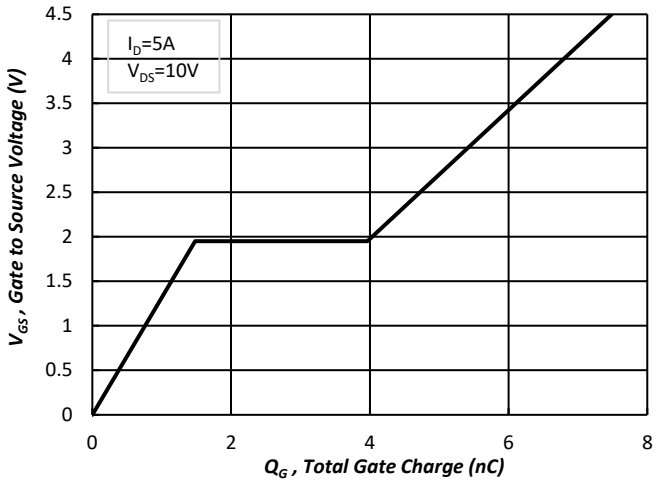


Fig.7 Gate Charge Characteristics

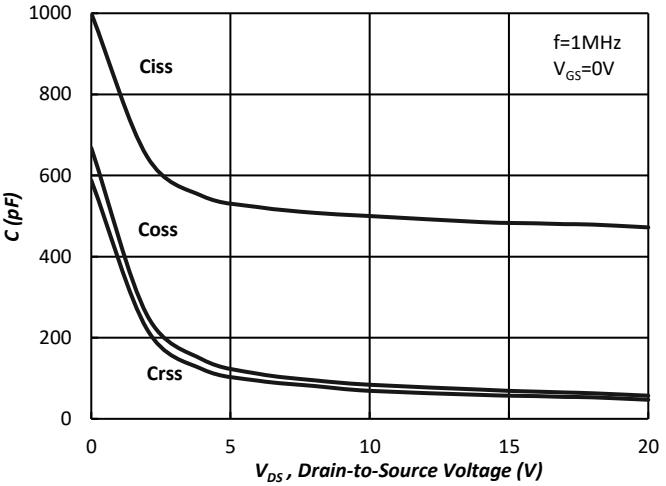


Fig.8 Typical Capacitance Characteristics

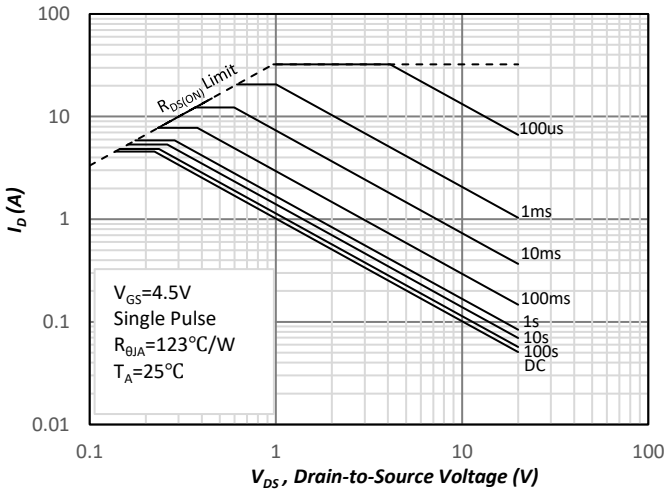


Fig 9. Maximum Safe Operating Area

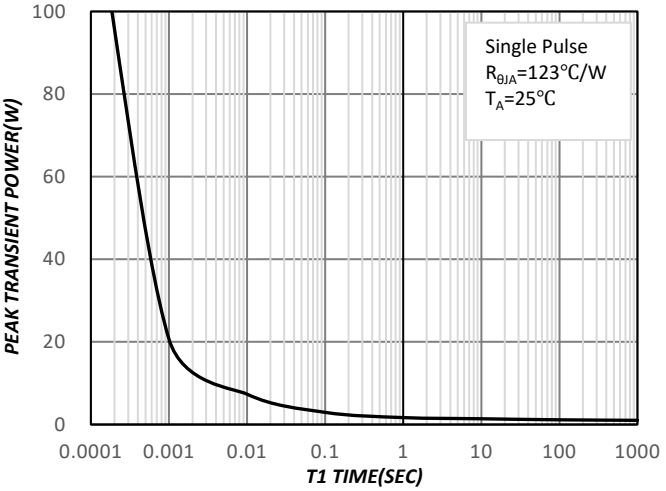


Fig 10. Single Pulse Maximum Power Dissipation

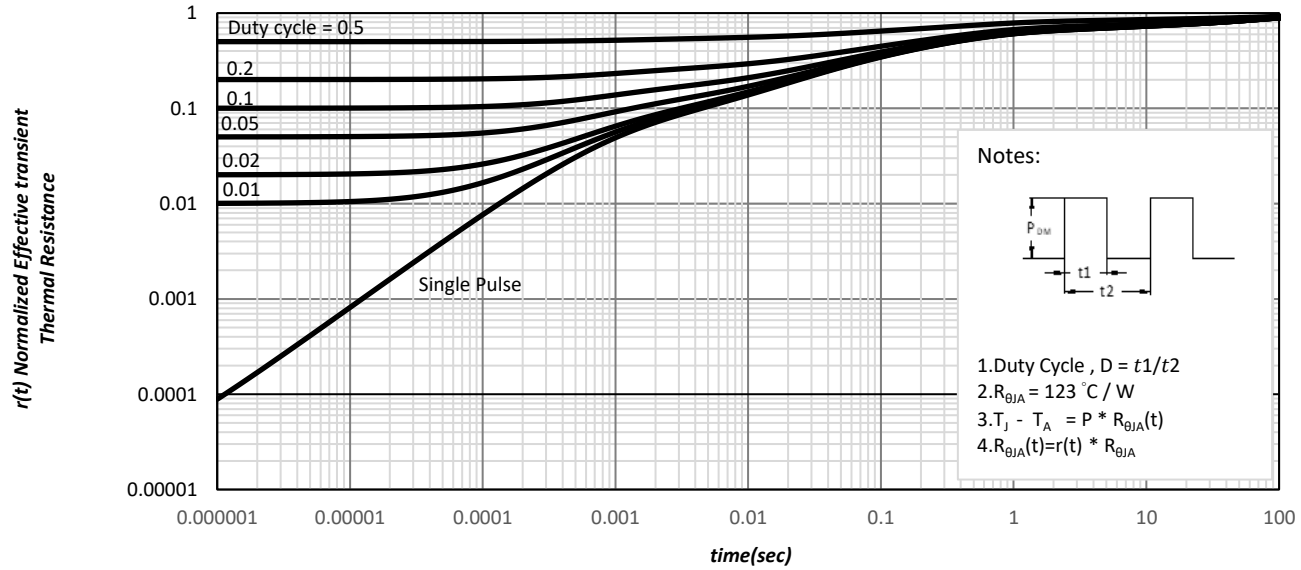
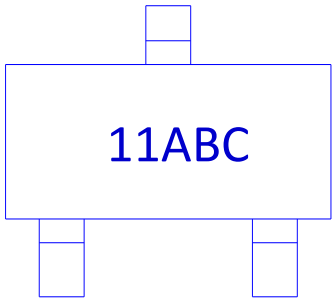


Fig 11. Effective Transient Thermal Impedance

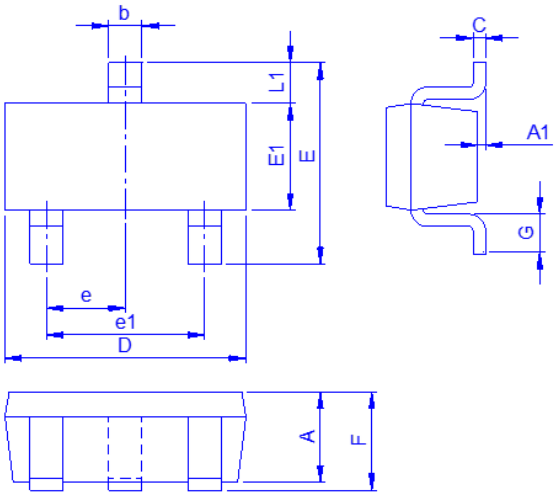
Ordering & Marking Information:

Device Name: EMF30N02JS for SOT23-3



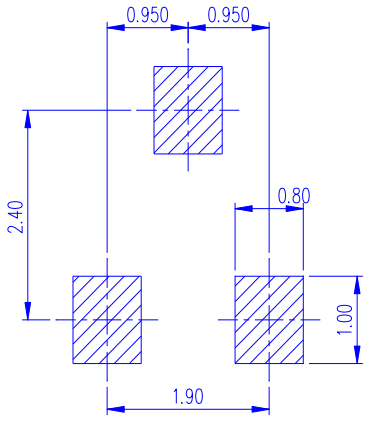
11: Device Code, 11 for EMF30N02JS
ABC: Date Code

Outline Drawing

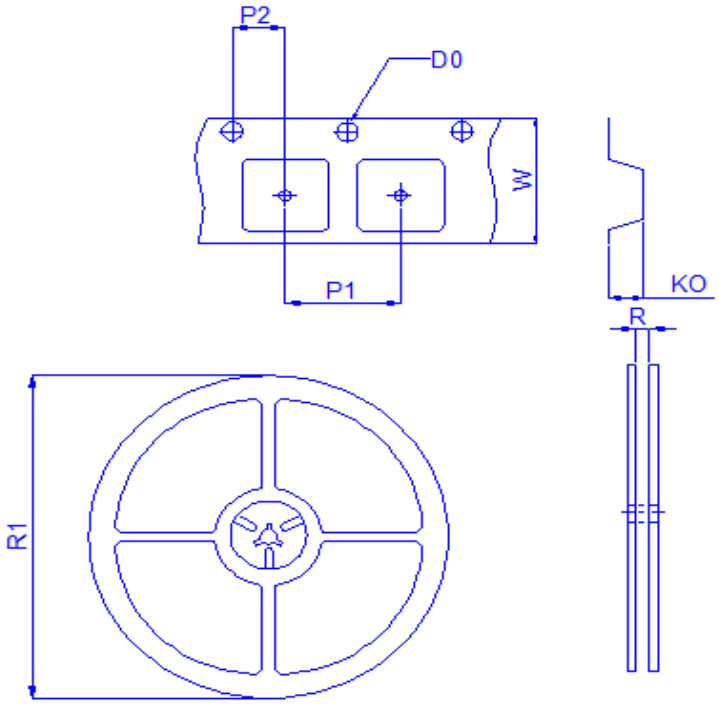


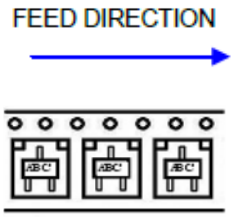
Dimension	A	A1	b	C	D	E	E1	e	e1	F	G	L1
Min.	0.70	-	0.30	0.08	2.80	2.10	1.20	0.90	1.80	0.80	0.30	0.54
Typ.	0.95	-	0.40	0.127	2.90	2.50	1.30	0.95	1.90	0.95	0.40	0.57
Max.	1.20	0.15	0.50	0.202	3.10	3.00	1.80	1.00	2.00	1.25	0.60	0.70

Footprint



◆ **Tape&Reel Information:3000pcs/Reel**



Package	SOT23-3
Reel	7”
Device orientation	

Dimension in mm

Dimension	Carrier tape					Reel	
	D0	K0	P1	P2	W	R	R1
Typ.	1.53	1.45	4	2	8	8.5	178
±	0.2	0.5	0.2	0.2	0.5	REF	REF