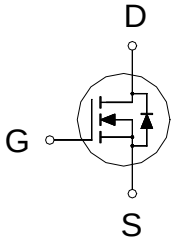
杰力科技股份有限公司
Excelliance MOS Corporation

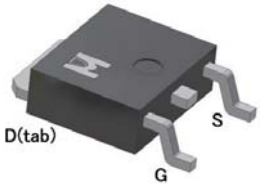
EMF65N15A

N-Channel Logic Level Enhancement Mode Field Effect Transistor

Product Summary:

BV_{DSS}	150V
$R_{DSON\ (MAX.)}$	65mΩ
I_D	20A





UIS, Rg 100% Tested

Pb-Free Lead Plating

GP
GREEN PRODUCT

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

PARAMETERS/TEST CONDITIONS		SYMBOL	LIMITS	UNIT
Gate-Source Voltage		V_{GS}	±16	V
Continuous Drain Current	T_C = 25 °C	I_D	20	A
	T_C = 100 °C		15	
Pulsed Drain Current[1]		I_{DM}	80	
Avalanche Current		I_{AS}	20	
Avalanche Energy	L = 0.1mH, ID=20A, RG=25Ω	E_{AS}	20	mJ
Repetitive Avalanche Energy[2]	L = 0.05mH	E_{AR}	10	
Power Dissipation	T_C = 25 °C	P_D	50	W
	T_C = 100 °C		20	
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	$R_{\theta JC}$		2.5	°C / W
Junction-to-Ambient	$R_{\theta JA}$		100	

[1]Pulse width limited by maximum junction temperature.

[2]Duty cycle ≤ 1%

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

PARAMETER	SYMBOL	TEST CONDITIONS	LIMITS			UNIT
			MIN	TYP	MAX	
STATIC						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D = 250μA	150			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250μA	0.45	0.75	1.20	
Gate-Body Leakage	I_{GSS}	V_{DS} = 0V, V_{GS} = ±16V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 120V, V_{GS} = 0V			1	μA
		V_{DS} = 100V, V_{GS} = 0V, T_J = 125 °C			25	
On-State Drain Current[1]	$I_{D(ON)}$	V_{DS} = 10V, V_{GS} = 10V	20			A
Drain-Source On-State Resistance[1]	$R_{DS(ON)}$	V_{GS} = 10V, I_D = 15A		40	55	mΩ
		V_{GS} = 5V, I_D = 10A		50	65	
		V_{GS} = 3V, I_D = 3A		60	75	
Forward Transconductance[1]	g_{fs}	V_{DS} = 5V, I_D = 10A		25		S
DYNAMIC						
Input Capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = 25V, f = 1MHz		10681		pF
Output Capacitance	C_{oss}			520		
Reverse Transfer Capacitance	C_{rss}			440		
Total Gate Charge[1,2]	Q_g	V_{DS} = 80V, V_{GS} = 5V, I_D = 10A		97		nC
Gate-Source Charge[1,2]	Q_{gs}			21.4		
Gate-Drain Charge[1,2]	Q_{gd}			28		
Turn-On Delay Time[1,2]	$t_{d(on)}$	V_{DS} = 75V, I_D = 1A, V_{GS} = 4.5V, R_{GS} = 6Ω		20		nS
Rise Time[1,2]	t_r			115		
Turn-Off Delay Time[1,2]	$t_{d(off)}$			330		
Fall Time[1,2]	t_f			380		
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (T_C = 25 °C)						
Continuous Current	I_S				20	A
Pulsed Current[3]	I_{SM}				80	
Forward Voltage[1]	V_{SD}	I_F = I_S, V_{GS} = 0V			1.3	V
Reverse Recovery Time	t_{rr}	I_F = 20A, dI_F/dt = 100A / μS		60		nS
Reverse Recovery Charge	Q_{rr}			130		nC

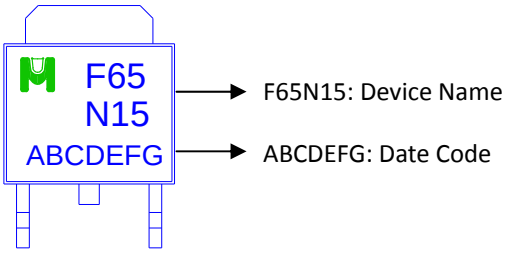
[1]Pulse test : Pulse Width ≤ 300 μsec, Duty Cycle ≤ 2%.

[2]Independent of operating temperature.

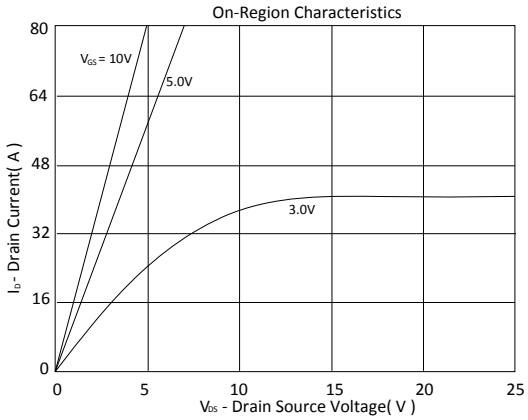
[3]Pulse width limited by maximum junction temperature.

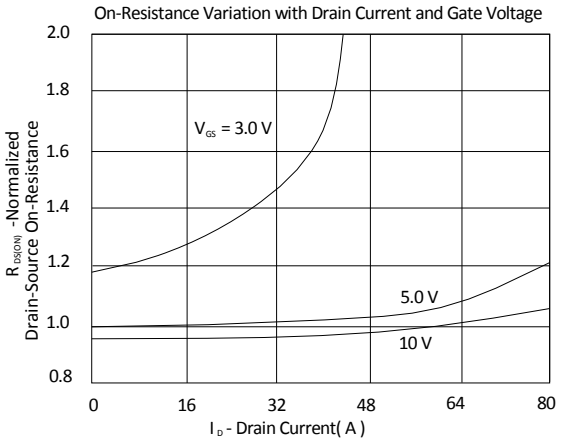
Ordering & Marking Information:

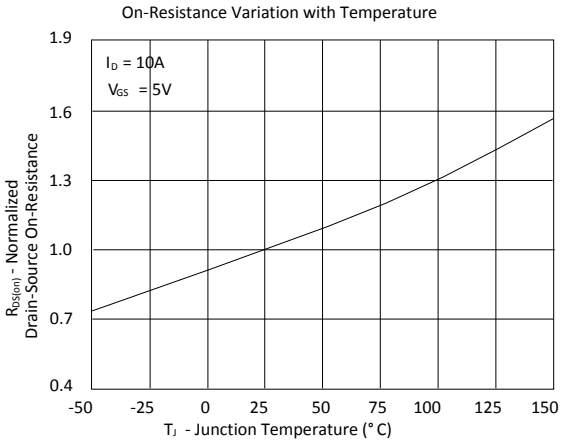
Device Name: EMF65N15A for DPAK (TO-252)

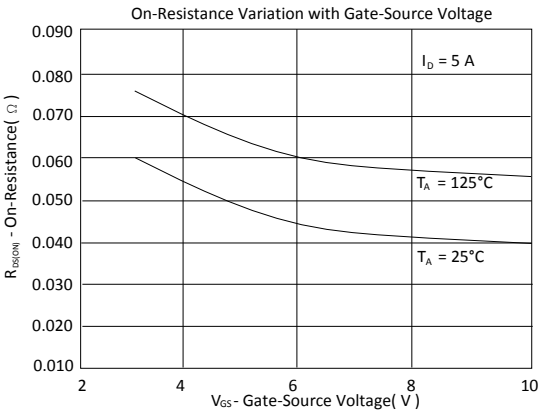


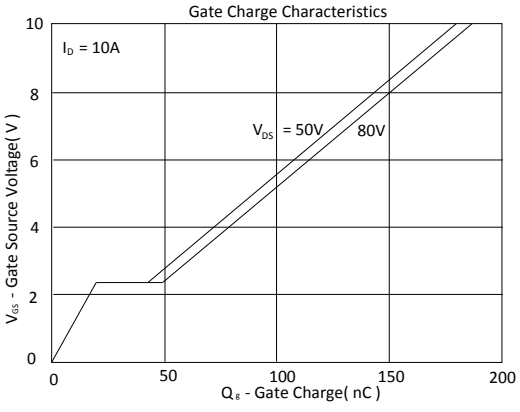
TYPICAL CHARACTERISTICS

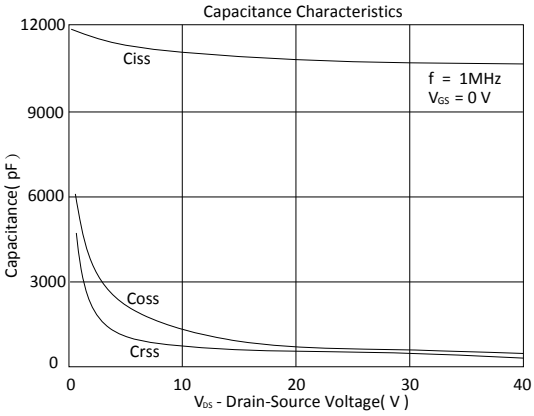


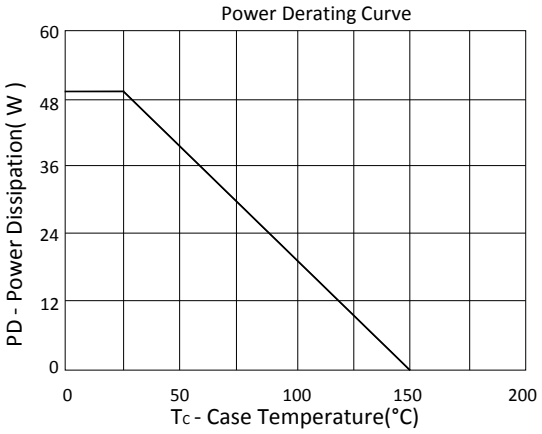


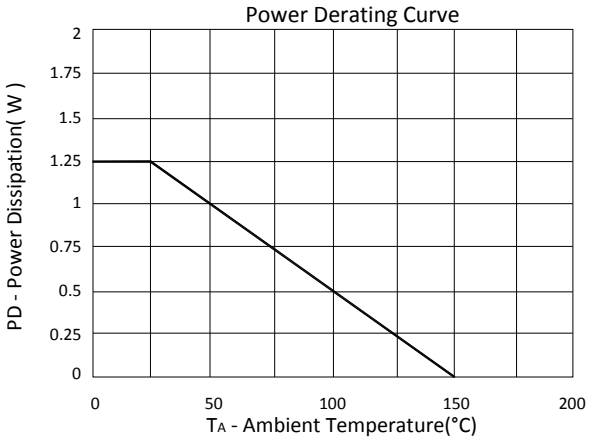


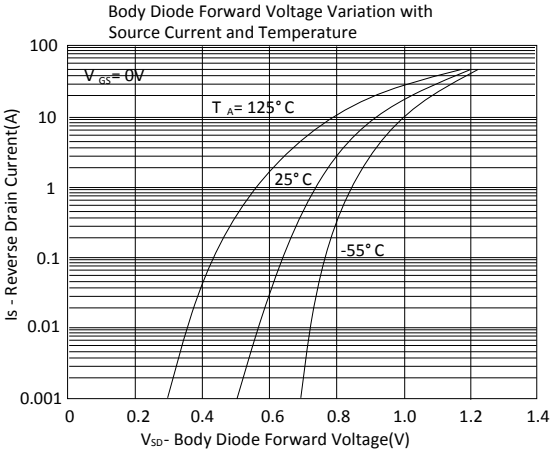


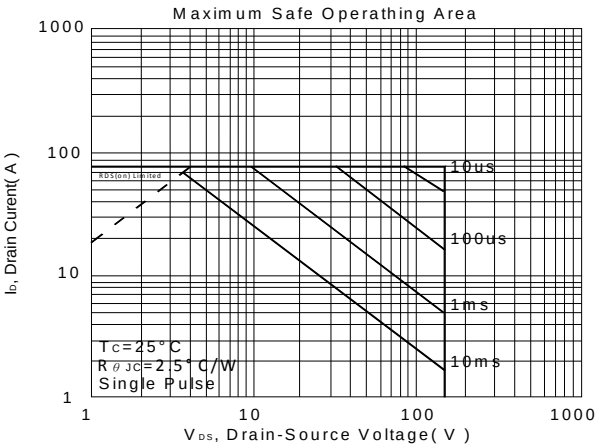


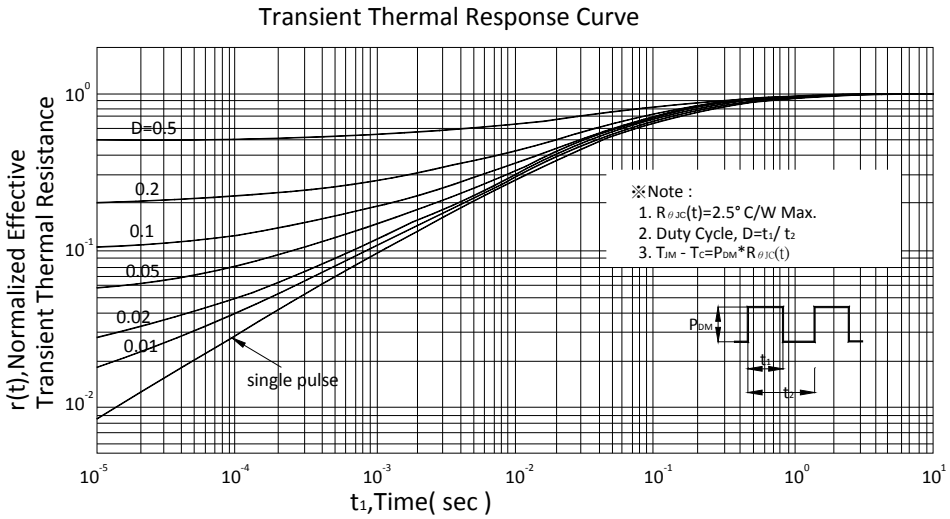



Power Derating Curve
PD - Power Dissipation(W)
60
48
36
24
12
0
0
50
100
150
200
TC - Case Temperature(°C)

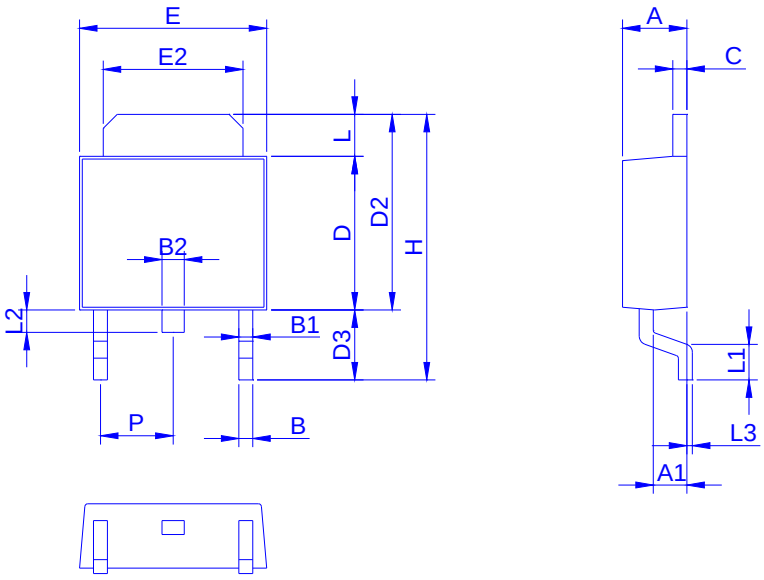

Power Derating Curve
PD - Power Dissipation(W)
2
1.75
1.5
1.25
1
0.75
0.5
0.25
0
0
50
100
150
200
TA - Ambient Temperature(°C)


Body Diode Forward Voltage Variation with
Source Current and Temperature
Is - Reverse Drain Current(A)
100
10
1
0.1
0.01
0.001
VGS= 0V
TA= 125°C
25°C
-55°C
0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
VSD- Body Diode Forward Voltage(V)


Maximum Safe Operathing Area
ID, Drain Curent(A)
1000
100
10
1
RDS(on) Limited
10us
100us
1ms
10ms
TC=25°C
RθJC=2.5°C/W
Single Pulse
1
10
100
1000
VDS, Drain-Source Voltage(V)


Transient Thermal Response Curve
r(t),Normalized Effective
Transient Thermal Resistance
10^0
10^-1
10^-2
D=0.5
0.2
0.1
0.05
0.02
0.01
single pulse
※Note :
1. RθJC(t)=2.5°C/W Max.
2. Duty Cycle, D=t1/ t2
3. TJM - TC=PDM*RθJC(t)
PDM
t1
t2
10^-5
10^-4
10^-3
10^-2
10^-1
10^0
10^1
t1,Time(sec)

Outline Drawing



Dimension in mm

Dimension	A	A1	B	B1	B2	C	D	D2	D3	E	E2	H	L	L1	L2	L3	P
Min.	2.10	0.95	0.30	0.40	0.60	0.40	5.30	6.70	2.20	6.40	4.80	9.20	0.89	0.90	0.50	0.00	2.10
Max.	2.50	1.30	0.85	0.94	1.00	0.60	6.20	7.30	3.00	6.70	5.45	10.15	1.70	1.65	1.10	0.30	2.50

Footprint