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

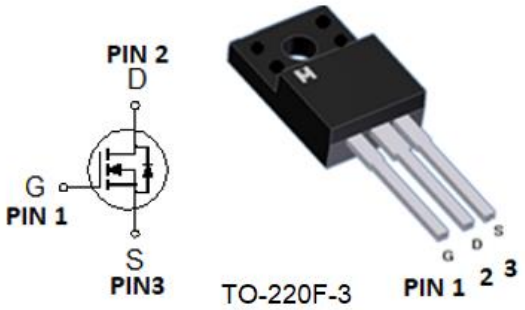
EMD04N06F

Single N-Channel Logic Level Enhancement Mode Field Effect Transistor

Product Summary:

BV_{DSS}	60V
$R_{DSON\ (MAX.)}$	5mΩ
I_D	75A

Pin Description:



Single N Channel MOSFET

UIS, Rg 100% Tested

Pb-Free Lead Plating & Halogen Free

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

PARAMETERS/TEST CONDITIONS		SYMBOL	LIMITS	UNIT
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current	T_C = 25 °C	I_D	75	A
	T_C = 100 °C		45	
Pulsed Drain Current[1]		I_{DM}	160	
Avalanche Current		I_{AS}	70	
Avalanche Energy	L = 0.1mH, ID=70A, RG=25Ω	E_{AS}	245	mJ
Repetitive Avalanche Energy[2]	L = 0.05mH	E_{AR}	122	
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

100% UIS testing in condition of V_D=30V, L=0.1mH, V_G=10V, I_L=40A, Rated V_{DS}=60V N-CH

THERMAL RESISTANCE RATINGS

THERMAL RESISTANCE	SYMBOL	TYPICAL	MAXIMUM	UNIT
Junction-to-Case	$R_{\theta JC}$		2.5	°C / W
Junction-to-Ambient	$R_{\theta JA}$		65	

[1]Pulse width limited by maximum junction temperature.

[2]Duty cycle ≤ 1%

[3]Pulsed drain current rating is package limited.

ELECTRICAL CHARACTERISTICS (T_J = 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	60			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250μA	2	3	4	
Gate-Body Leakage	I_{GSS}	V_{DS} = 0V, V_{GS} = ±20V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 48V, V_{GS} = 0V			1	μA
		V_{DS} = 40V, V_{GS} = 0V, T_J = 125 °C			25	
On-State Drain Current[1]	$I_{D(ON)}$	V_{DS} = 5V, V_{GS} = 10V	75			A
Drain-Source On-State Resistance[1]	$R_{DS(ON)}$	V_{GS} = 10V, I_D = 20A		4.6	5.0	mΩ
Forward Transconductance[1]	g_{fs}	V_{DS} = 5V, I_D = 20A		55		S
DYNAMIC						
Input Capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = 25V, f = 1MHz		5085		pF
Output Capacitance	C_{oss}			573		
Reverse Transfer Capacitance	C_{rss}			190		
Gate Resistance	R_g	V_{GS} = 15mV, V_{DS} = 0V, f = 1MHz		1.5		Ω
Total Gate Charge[1,2]	Q_g	V_{DS} = 30V, V_{GS} = 10V, I_D = 20A		59		nC
Gate-Source Charge[1,2]	Q_{gs}			20		
Gate-Drain Charge[1,2]	Q_{gd}			19		
Turn-On Delay Time[1,2]	$t_{d(on)}$	V_{DS} = 30V, I_D = 1A, V_{GS} = 10V, R_{GS} = 6Ω		55		nS
Rise Time[1,2]	t_r			150		
Turn-Off Delay Time[1,2]	$t_{d(off)}$			90		
Fall Time[1,2]	t_f			160		
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (T_C = 25 °C)						
Continuous Current	I_S				75	A
Pulsed Current[3]	I_{SM}				150	
Forward Voltage[1]	V_{SD}	I_F = 20A, V_{GS} = 0V			1.3	V
Reverse Recovery Time	t_{rr}	I_F = 25A, dI_F/dt = 100A / μS		35		nS
Reverse Recovery Charge	Q_{rr}			220		nC

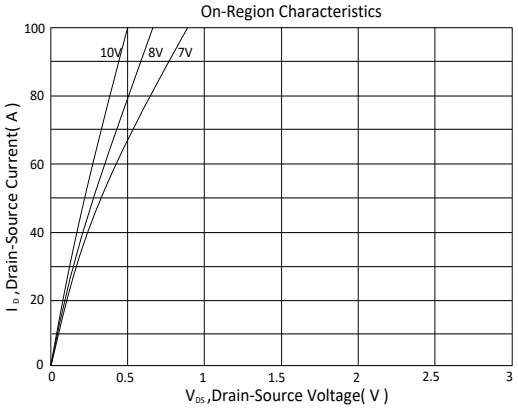
[1]Pulse test : Pulse Width ≤ 300 μsec, Duty Cycle ≤ 2%.

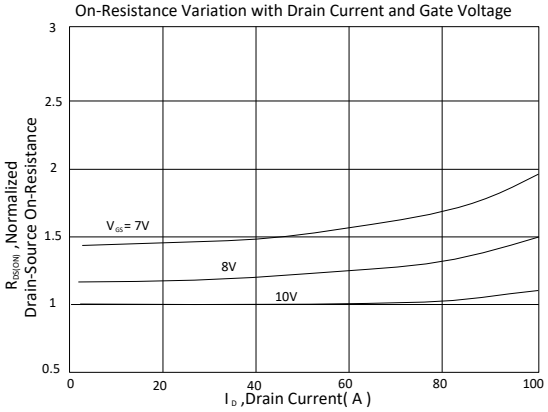
[2]Independent of operating temperature.

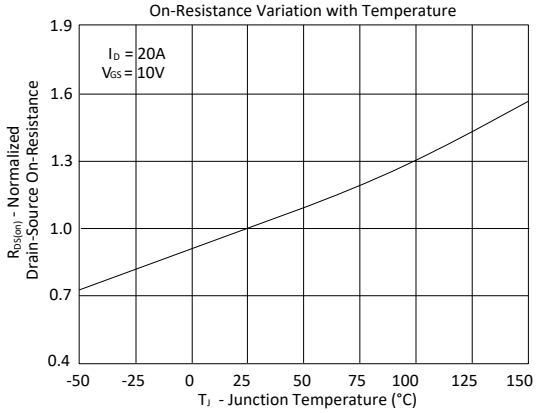
[3]Pulse width limited by maximum junction temperature.

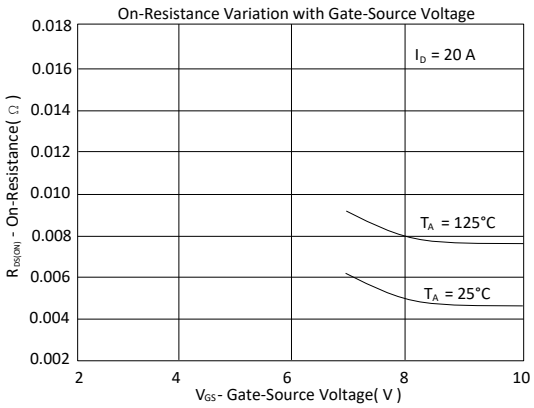
EMC will review datasheet by quarter, and update new version.

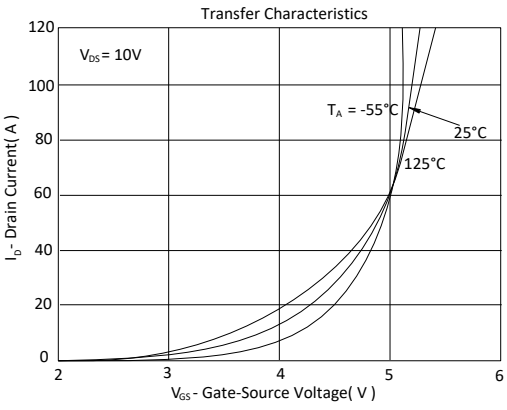
TYPICAL CHARACTERISTICS

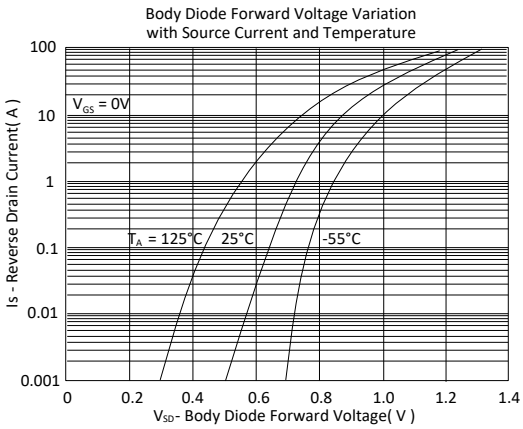


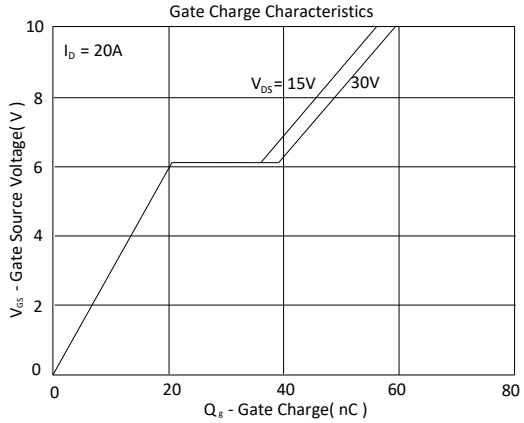


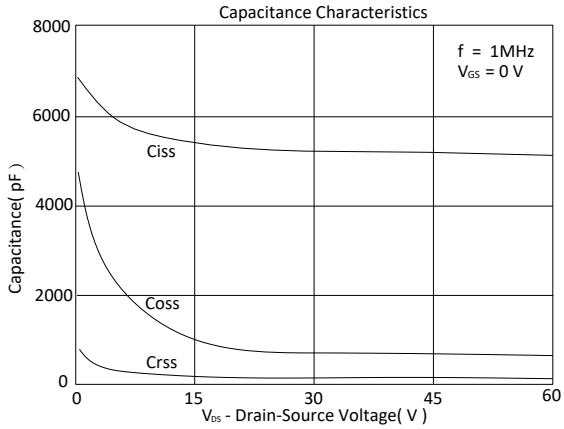


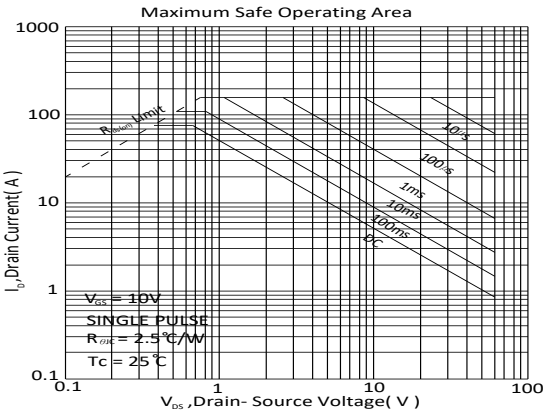


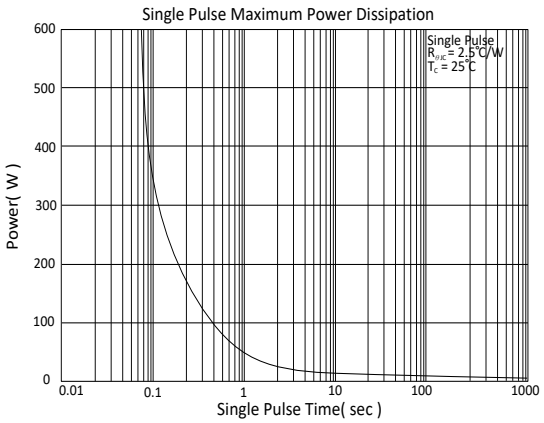


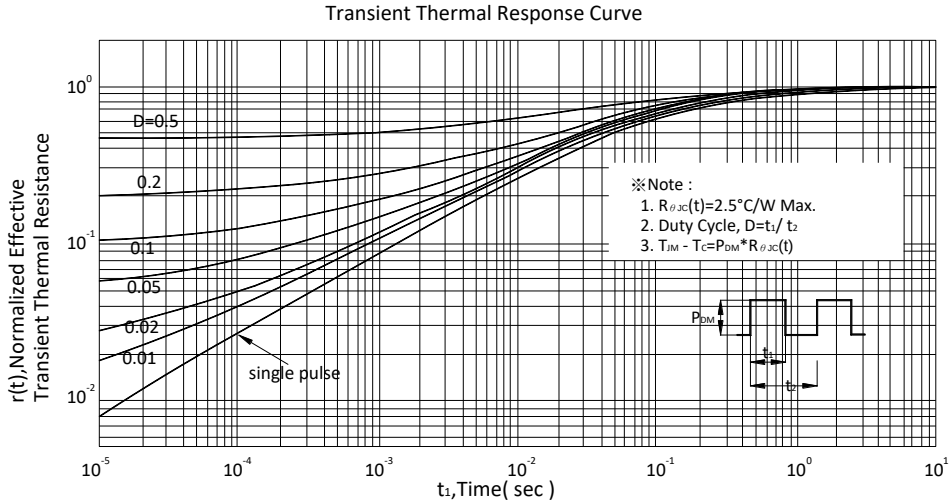



Gate Charge Characteristics
I_D = 20A
V_{DS}= 15V
30V
V_{GS} - Gate Source Voltage(V)
Q_g - Gate Charge(nC)


Capacitance Characteristics
f = 1MHz
V_{GS} = 0 V
Ciss
Coss
Crss
Capacitance(pF)
V_{DS} - Drain-Source Voltage(V)

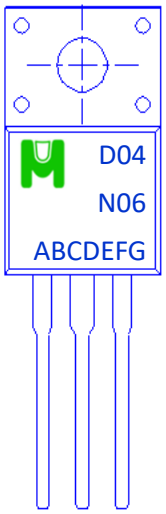

Maximum Safe Operating Area
V_{GS} = 10V
SINGLE PULSE
$R_{\theta JC}$ = 2.5°C/W
Tc = 25°C
I_D,Drain Current(A)
V_{DS} ,Drain- Source Voltage(V)


Single Pulse Maximum Power Dissipation
Single Pulse
$R_{\theta JC}$ = 2.5°C/W
T_C = 25°C
Power(W)
Single Pulse Time(sec)


Transient Thermal Response Curve
D=0.5
0.2
0.1
0.05
0.02
0.01
single pulse
※Note :
1. $R_{\theta JC}$(t)=2.5°C/W Max.
2. Duty Cycle, D=t_1/ t_2
3. T_{JM} - T_C=P_{DM}*$R_{\theta JC}$(t)
P_{DM}
t_1
t_2
r(t),Normalized Effective Transient Thermal Resistance
t_1,Time(sec)

Ordering & Marking Information:

Device Name: EMD04N06F for TO-220F



D04N06: Device Name

ABCDEFG: Date Code

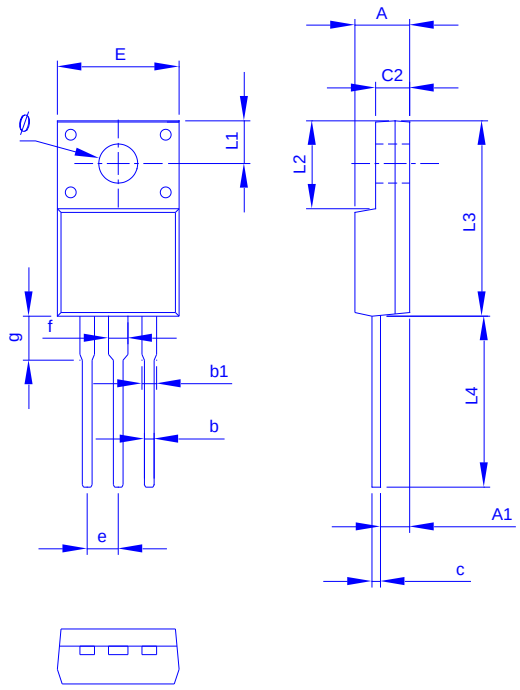
A: Assembly House

B: Year(A:2008 B:2009 C:2010….)

C: Month(A:01 B:02 C:03 D:04 E:05 F:06 G:07 H:08 I:09 J:10 K:11 L:12)

DEFG: Serial No.

Outline Drawing



Dimension in mm

Dimension	A	A1	b	b1	c	c2	E	L1	L2	L3	L4	ø	e	f	g
Min.	4.3	2.49	0.5	1.1	0.4	2.34	9.96	2.7	6.48	14.8	12.65	3	2.44	1.17	2.93
Typ.	4.5	2.59	0.8	1.3	0.5	2.54	10.1	3.25	6.68	15.87	12.98	3.1	2.54	1.28	3.03
Max.	4.9	2.96	0.95	1.6	0.75	3.2	10.36	3.45	6.9	16.2	13.6	3.38	2.64	1.75	4.00

◆Tube Information:50pcs/Tube (1000pcs/Box)