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

EMD03N06E

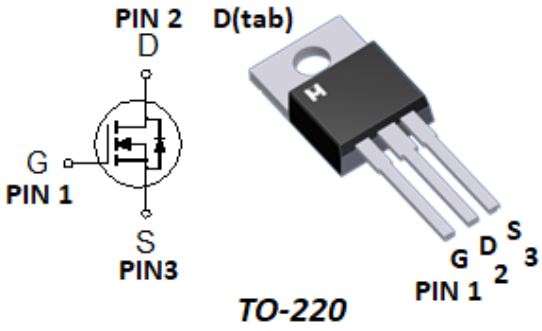
Single N-Channel Logic Level Enhancement Mode Field Effect Transistor

▪Product Summary:

	N-CH
BVDSS	60 V
$R_{DSON\ (MAX.)}$@V_{GS}=10V	3.5 mΩ
I_D @T_C=25°C	180 A

SingleN Channel MOSFET
UIS, Rg 100% Tested
RoHS & Halogen Free & TSCA Compliant

▪ Pin Description:



TO-220

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

PARAMETERS/TEST CONDITIONS		SYMBOL	LIMITS	UNIT
Gate-Source Voltage		V_{GS}	±30	V
Continuous Drain Current	T_C = 25 °C	I_D	180	A
	T_C = 100 °C		127	
Pulsed Drain Current[1]		I_{DM}	540	
Avalanche Current		I_{AS}	90	
Avalanche Energy	L = 0.1mH	EAS	405	mJ
Repetitive Avalanche Energy[2]	L = 0.05mH	EAR	202.5	
Power Dissipation	T_C = 25 °C	P_D	277	W
	T_C = 100 °C		111	
Operating Junction & Storage Temperature Range		T_j, T_{stg}	-55 to 150	°C

▪ 100% UIS testing in condition of VD=30V, L=0.1mH, VG=10V, IL=60A, Rated VDS=60V N-CH

▪THERMAL RESISTANCE RATINGS

THERMAL RESISTANCE	SYMBOL	TYPICAL	MAXIMUM	UNIT
Junction-to-Case	$R_{\theta JC}$		0.45	°C/W
Junction-to-Ambient[3]	$R_{\theta JA}$		62.5	

[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	$V_{(BR)DSS}$	V_{GS} = 0V, I_D = 250uA	60			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250uA	2	3	4	
Gate-Body Leakage	I_{GSS}	V_{DS} = 0V, V_{GS} = ±30V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 48V, V_{GS} = 0V			1	uA
		V_{DS} = 40V, V_{GS} = 0V, T_J = 125 °C			25	
On-State Drain Current[1]	$I_{D(ON)}$	V_{DS} = 10V, V_{GS} = 10V	180			A
Drain-Source On-State Resistance[1]	$R_{DS(ON)}$	V_{GS} = 10V, I_D = 50A		3.1	3.5	mΩ
Forward Transconductance[1]	g_{fs}	V_{DS} = 5V, I_D = 20A		60		S
DYNAMIC						
Input Capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = 30V, f = 1MHz		5519		pF
Output Capacitance	C_{oss}			815		
Reverse Transfer Capacitance	C_{rss}			50		
Gate Resistance	R_g	V_{GS} = 15mV, V_{DS} = 0V, f = 1MHz		1.7		Ω
Total Gate Charge[1,2]	Q_g(V_{GS}=10V)	V_{DS} = 30V, V_{GS} = 10V, I_D = 20A		61		nC
Gate-Source Charge[1,2]	Q_{gs}			36		
Gate-Drain Charge[1,2]	Q_{gd}			10		
Turn-On Delay Time[1,2]	$t_{d(on)}$	V_{DS} = 30V, V_{GS} = 10V, I_D = 20A , Rg = 6Ω		80		nS
Rise Time[1,2]	t_r			160		
Turn-Off Delay Time[1,2]	$t_{d(off)}$			100		
Fall Time[1,2]	t_f			180		
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS						
Continuous Current	I_S				180	A
Pulsed Current[3]	I_{SM}				540	
Forward Voltage[1]	V_{SD}	I_F = 50A, V_{GS} = 0V			1.3	V
Reverse Recovery Time	t_{rr}	I_F = 50A, dI_F/dt = 100A / uS		35		nS
Reverse Recovery Charge	Q_{rr}			270		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

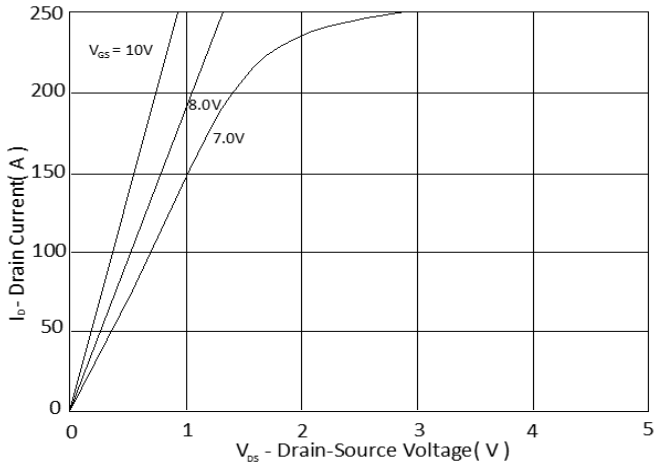


Fig.1 Typical Output Characteristics

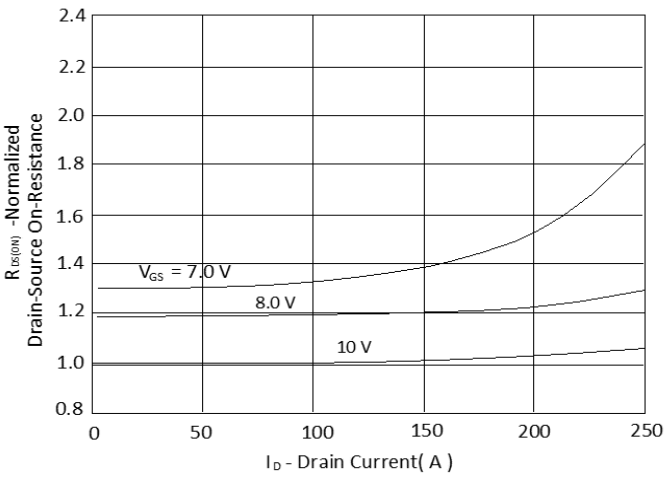


Fig.2 On-Resistance Variation with Drain Current and Gate Voltage

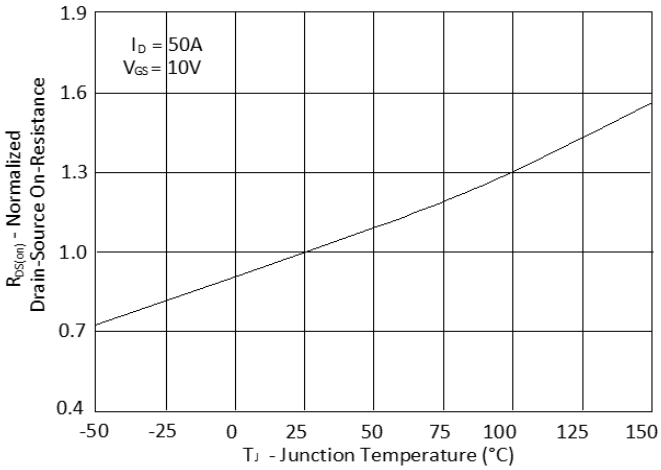


Fig.3 Normalized On-Resistance v.s. Junction Temperature

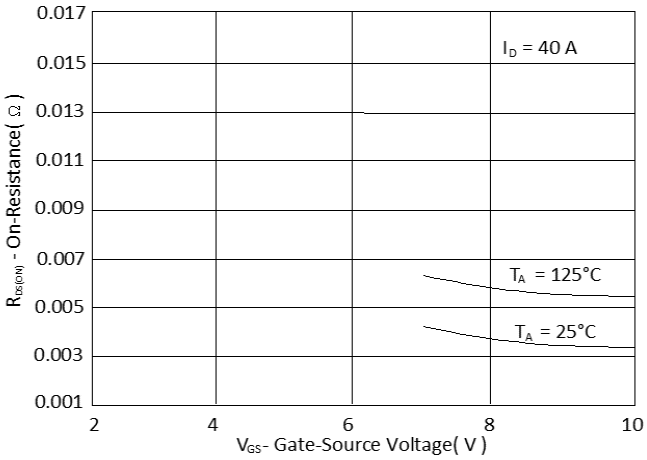


Fig.4 On-Resistance v.s. Gate Voltage

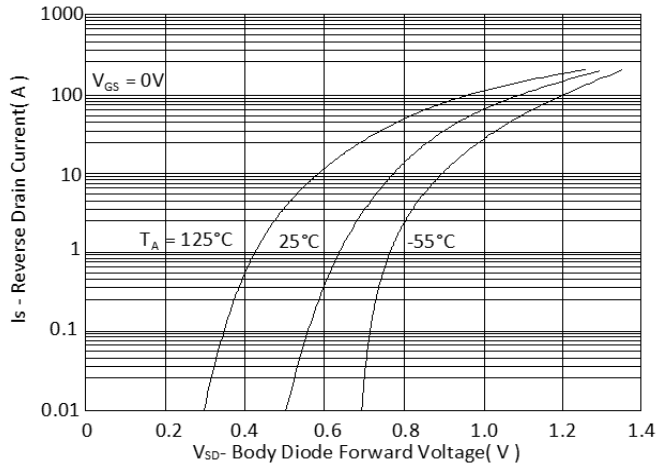


Fig.5 Forward Characteristic of Reverse Diode

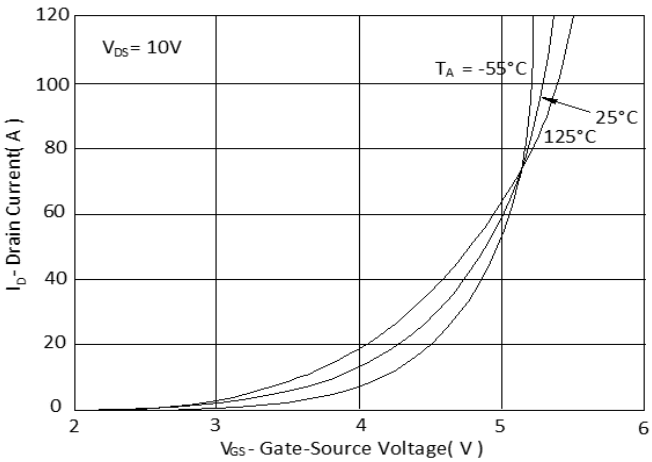


Fig.6 Transfer Characteristics

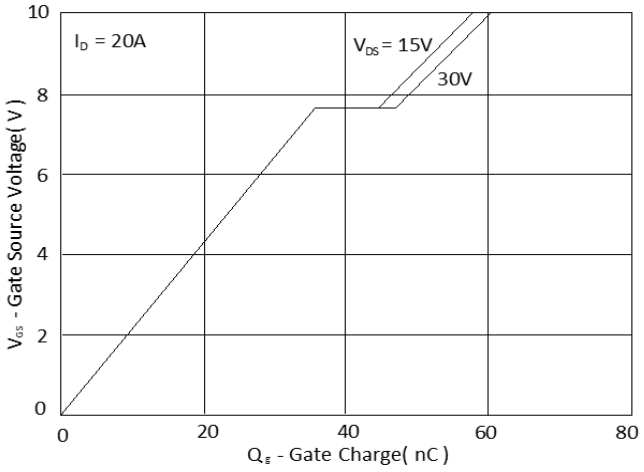


Fig.7 Gate Charge Characteristics

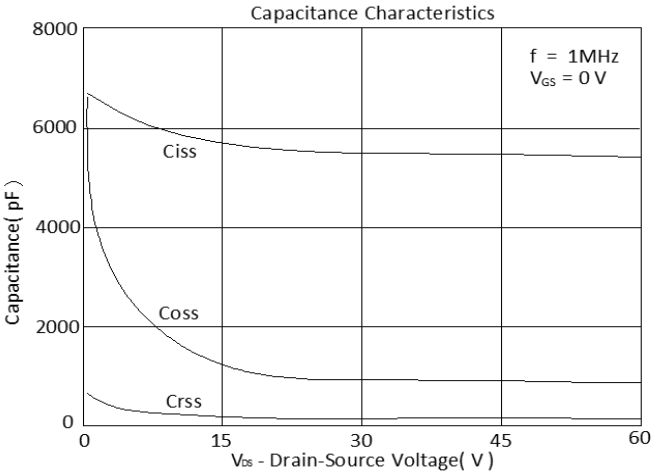


Fig.8 Typical Capacitance Characteristics

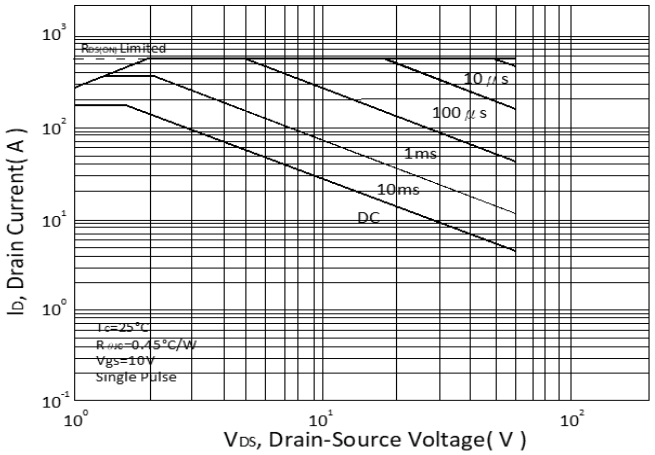


Fig 9. Maximum Safe Operating Area

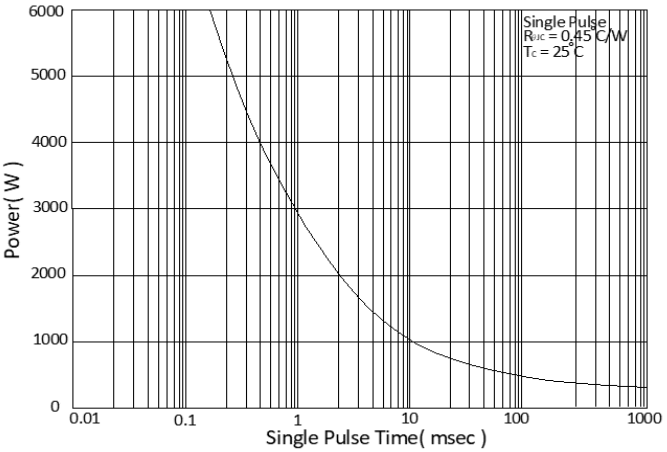


Fig 10. Single Pulse Maximum Power Dissipation

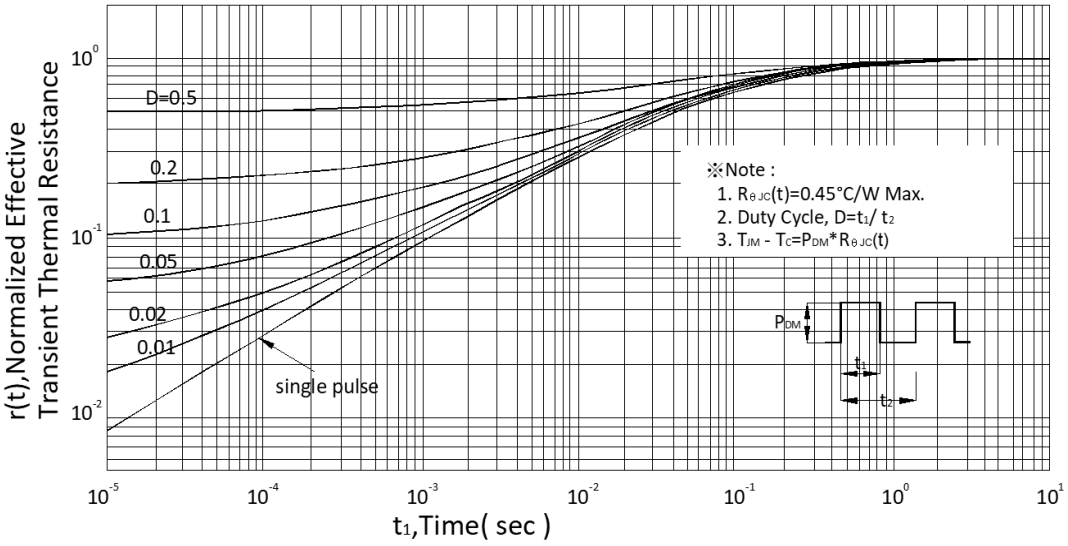
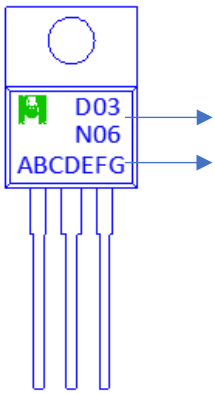


Fig 11. Effective Transient Thermal Impedance

Ordering & Marking Information:

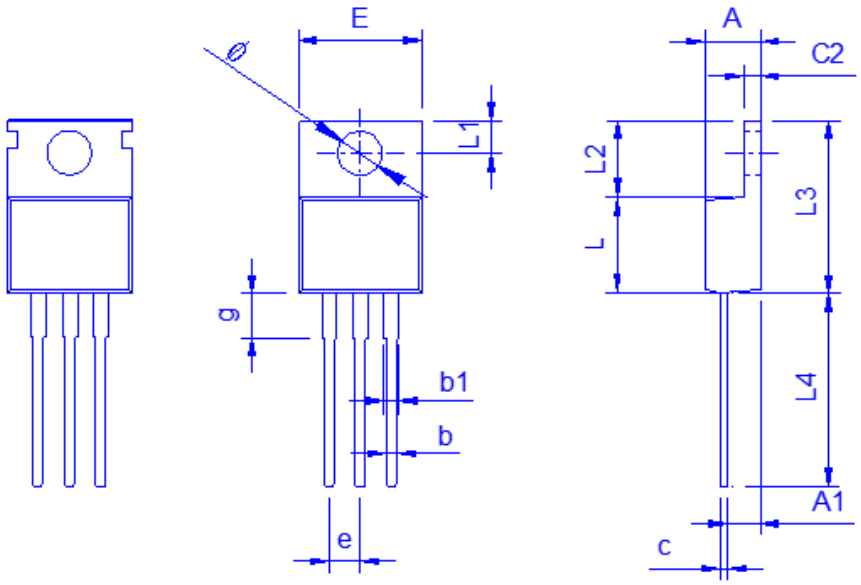
Device Name: EMD03N06E for TO-220



D03N06: 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	A	A1	b	b1	c	c2	E	L	L1	L2	L3	L4	Ø
Min.	4.24	2.25	0.7	1.17	0.31	1.15	9.91	8.5	2.59	6.1	14.7	12.7	3.4
Typ.	4.44	2.4	0.8	1.55	0.5	1.27	10.16	8.92	2.8	6.3	15.37	13.72	3.84
Max.	4.7	2.82	0.91	1.75	0.65	1.4	10.36	9.75	3.25	6.8	16.9	13.97	3.935

Dimension	e	g
Min.	2.44	2.85
Typ.	2.54	3.8
Max.	2.64	4

◆ **Tape&Reel Information: 50pcs/Tube (1000pcs/Box)**