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

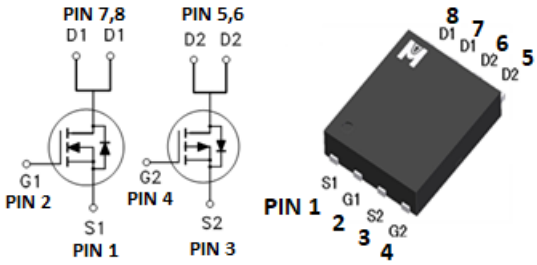
EMB18C03H

N-Channel + P Channel Logic Level Enhancement Mode Field Effect Transistor

▪Product Summary:

	N-CH	P-CH
BVDSS	30 V	-30 V
$R_{DSON\ (MAX.)}$@V_{GS}=10V	20 mΩ	33 mΩ
$R_{DSON\ (MAX.)}$@V_{GS}=4.5V	26 mΩ	48 mΩ
I_D @T_C=25°C	27 A	-22 A
I_D @T_A=25°C	7 A	-6 A

▪ Pin Description:



EDFN5X6_SYM

N Channel + P Channel MOSFET
UIS, Rg 100% Tested
RoHS & Halogen Free & TSCA Compliant

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

PARAMETERS/TEST CONDITIONS		SYMBOL	LIMITS		UNIT
			N-CH	P-CH	
Gate-Source Voltage		V_{GS}	±20	±20	V
Continuous Drain Current	T_C = 25 °C	I_D	27	-22	A
	T_C = 100 °C		17	-14	
Continuous Drain Current	T_A = 25 °C	I_D	7	-6	
	T_A = 70 °C		6	-5	
Pulsed Drain Current[1]		I_{DM}	43	-36	
Avalanche Current		I_{AS}	24	-35	
Avalanche Energy	L = 0.1mH	EAS	28.8	61.25	mJ
Repetitive Avalanche Energy[2]	L = 0.05mH	EAR	14.4	30.63	
Power Dissipation	T_C = 25 °C	P_D	25	25	W
	T_C = 100 °C		10	10	
Power Dissipation	T_A = 25 °C	P_D	2	2	W
	T_A = 70 °C		1.3	1.3	
Operating Junction & Storage Temperature Range		T_j, T_{stg}	-55 to 150		°C

▪ 100% UIS testing in condition of VD=20V, L=0.1mH, VG=10V, IL=15A, Rated VDS=30V N-CH

▪ 100% UIS testing in condition of VD=20V, L=0.1mH, VG=10V, IL=20A, Rated VDS=-30V P-CH

▪THERMAL RESISTANCE RATINGS

THERMAL RESISTANCE	SYMBOL	TYPICAL	MAXIMUM		UNIT
			N-CH	P-CH	
Junction-to-Case	$R_{\theta JC}$		5	5	°C/W
Junction-to-Ambient[3]	$R_{\theta JA}$		62.5	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

▪ **N-CH_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 = 250uA	30			V
Gate Threshold Voltage[4]	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250uA	1.5	1.8	3	V
Gate-Body Leakage[4]	I_{GSS}	V_{DS} = 0V, V_{GS} = ±20V			±100	nA
Zero Gate Voltage Drain Current[4]	I_{DSS}	V_{DS} = 30V, V_{GS} = 0V			1	uA
		V_{DS} =30V, V_{GS} = 0V, T_J = 125 °C			25	uA
On-State Drain Current[1]	$I_{D(ON)}$	V_{DS} = 10V, V_{GS} = 10V	27			A
Drain-Source On-State Resistance[1,4]	$R_{DS(ON)}$	V_{GS} = 10V, I_D = 10A		15	20	mΩ
		V_{GS} = 4.5V, I_D = 6A		20	26	mΩ
Forward Transconductance[1]	g_{fs}	V_{DS} = 5V, I_D = 10A		18		S
DYNAMIC						
Input Capacitance[5]	C_{iss}	V_{GS} = 0V, V_{DS} = 15V, f = 1MHz		727		pF
Output Capacitance[5]	C_{oss}			123		pF
Reverse Transfer Capacitance[5]	C_{rss}			107		pF
Gate Resistance[4,5]	R_g	f = 1MHz		1.4		Ω
Total Gate Charge[1,2,5]	Q_g(V_{GS}=10V)	V_{DS} = 15V, V_{GS} = 10V, I_D = 10A		16.0		nC
	Q_g(V_{GS}=4.5V)			8.8		nC
Gate-Source Charge[1,2,5]	Q_{gs}			2.0		nC
Gate-Drain Charge[1,2,5]	Q_{gd}			4.8		nC
Turn-On Delay Time[1,2,5]	$t_{d(on)}$	V_{DS} = 15V, V_{GS} = 10V, I_D = 5A , Rg = 3Ω		6.7		nS
Rise Time[1,2,5]	t_r			12.2		nS
Turn-Off Delay Time[1,2,5]	$t_{d(off)}$			21.4		nS
Fall Time[1,2,5]	t_f			16.2		nS
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS						
Continuous Current	I_S				27	A
Pulsed Current[3]	I_{SM}				43	A
Forward Voltage[1,4]	V_{SD}	I_F = 10A, V_{GS} = 0V			1.2	V
Reverse Recovery Time[5]	t_{rr}	I_F = 10A, dI_F/dt = 100A / uS		10.3		nS
Peak Reverse Recovery Current[5]	$I_{RM(REC)}$			0.84		A
Reverse Recovery Charge[5]	Q_{rr}			4.3		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

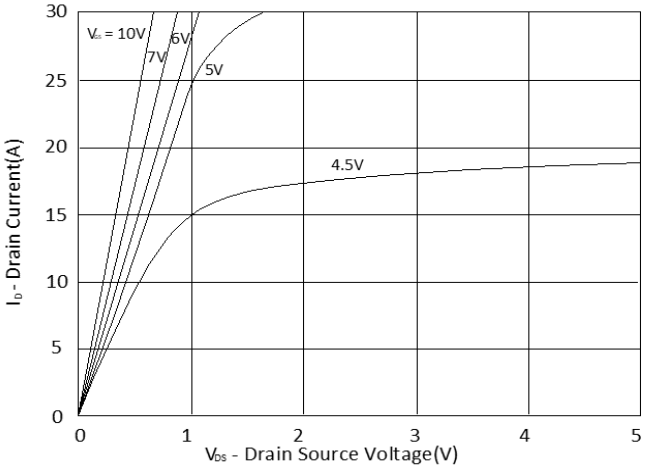


Fig.1 Typical Output Characteristics

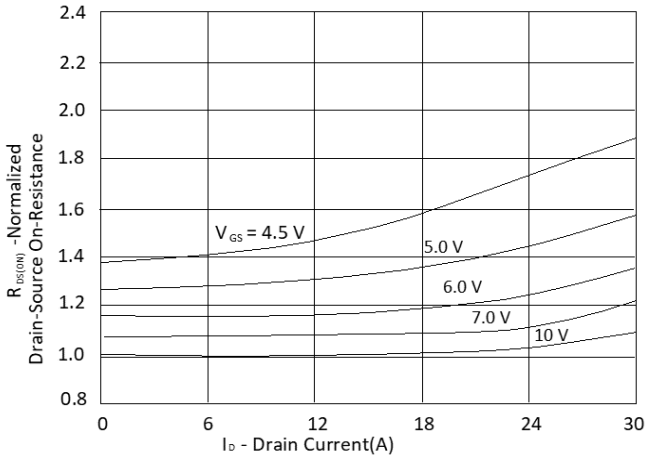


Fig.2 On-Resistance Variation with Drain Current and Gate Voltage

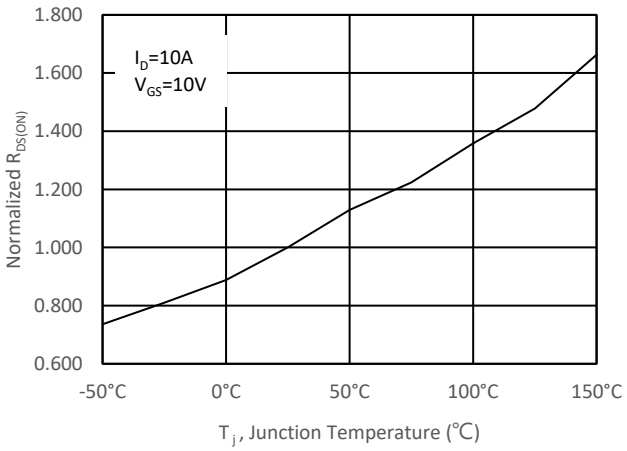


Fig.3 Normalized On-Resistance v.s. Junction Temperature

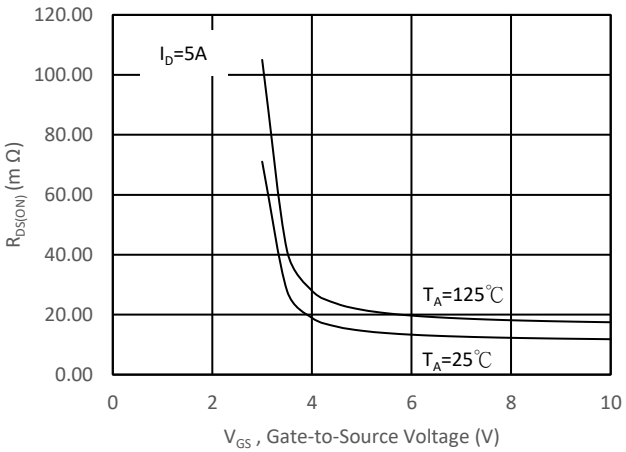


Fig.4 On-Resistance v.s. Gate Voltage

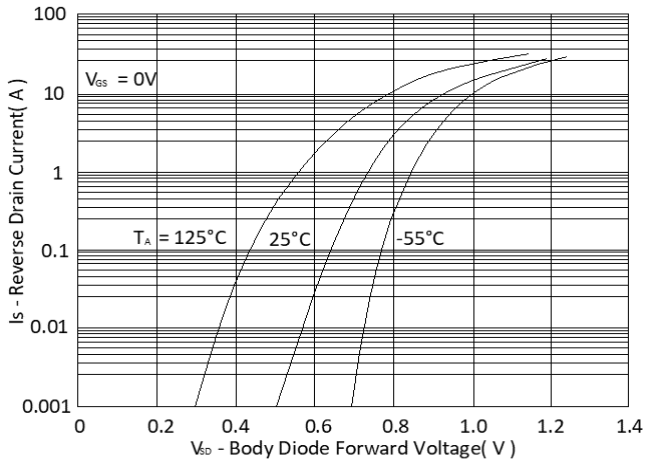


Fig.5 Forward Characteristic of Reverse Diode

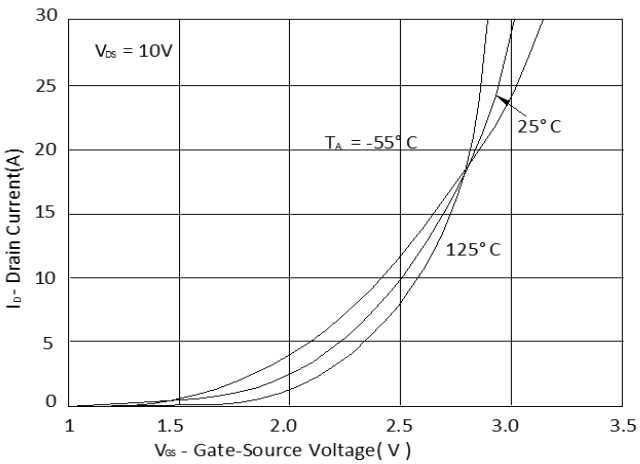


Fig.6 Transfer Characteristics

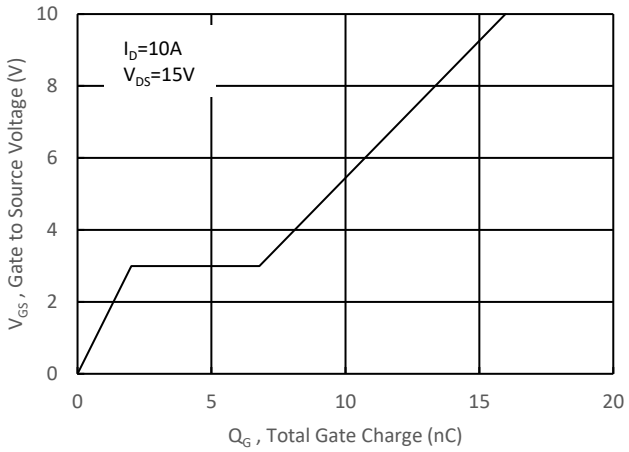


Fig.7 Gate Charge Characteristics

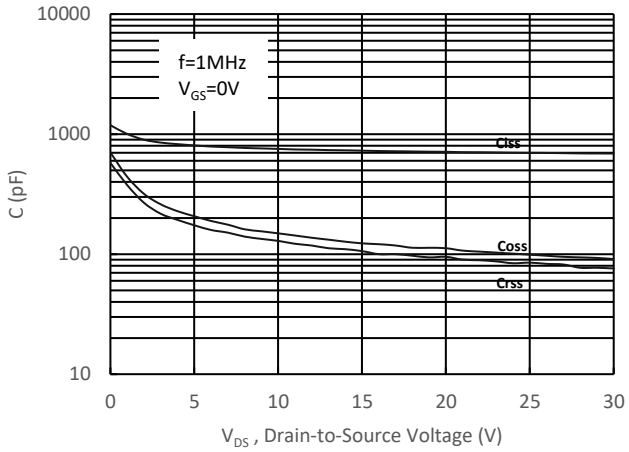


Fig.8 Typical Capacitance Characteristics

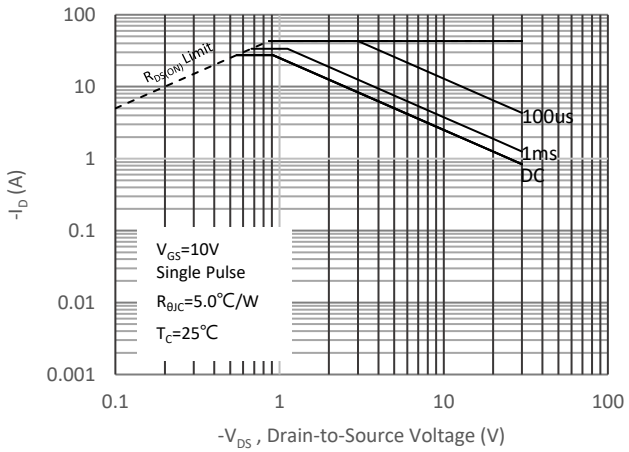


Fig 9. Maximum Safe Operating Area

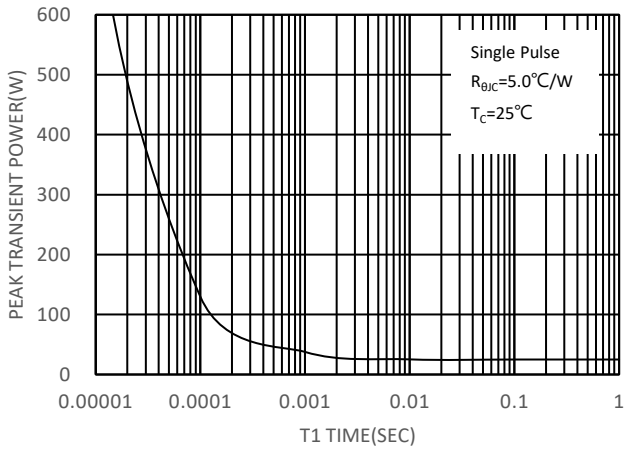


Fig 10. Single Pulse Maximum Power Dissipation

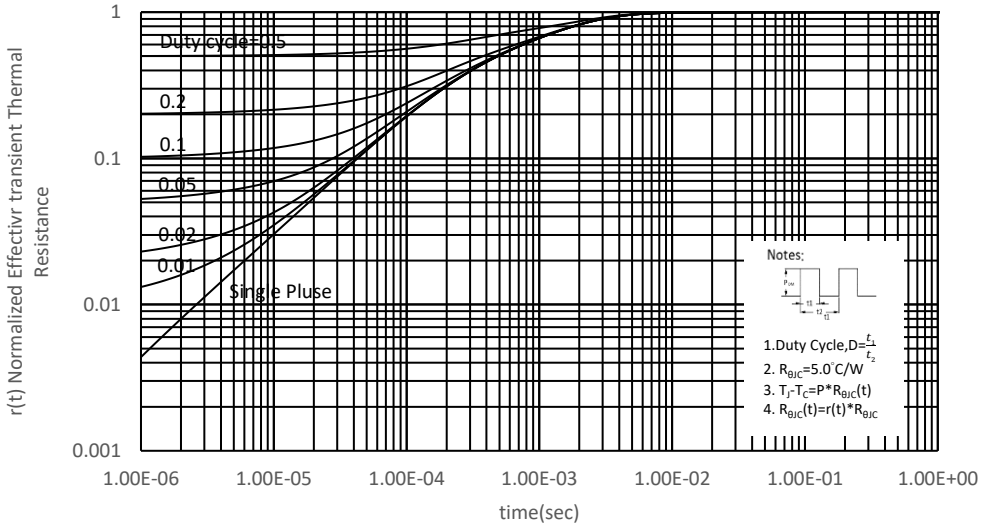


Fig 11. Effective Transient Thermal Impedance

▪ **P-CH_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 = -250uA	-30			V
Gate Threshold Voltage[4]	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = -250uA	-1.5	-2.0	-3.0	
Gate-Body Leakage[4]	I_{GSS}	V_{DS} = 0V, V_{GS} = ±20V			±100	nA
Zero Gate Voltage Drain Current[4]	I_{DSS}	V_{DS} = -30V, V_{GS} = 0V			-1	uA
		V_{DS} =-30V, V_{GS} =0V, T_J = 125 °C			-25	
On-State Drain Current[1]	$I_{D(ON)}$	V_{DS} = -5V, V_{GS} = -10V	-22			A
Drain-Source On-State Resistance[1,4]	$R_{DS(ON)}$	V_{GS} = -10V, I_D = -8A		25	33	mΩ
		V_{GS} = -4.5V, I_D = -6A		36	48	
Forward Transconductance[1]	g_{fs}	V_{DS} = -5V, I_D = -8A		24		S
DYNAMIC						
Input Capacitance[5]	C_{iss}	V_{GS} = 0V, V_{DS} = -15V, f = 1MHz		775		pF
Output Capacitance[5]	C_{oss}			126		
Reverse Transfer Capacitance[5]	C_{rss}			100		
Gate Resistance[4,5]	R_g	f = 1MHz		5.2		Ω
Total Gate Charge[1,2,5]	Q_g(V_{GS}=10V)	V_{DS} = -15V, V_{GS} = -10V, I_D = -8A		14.6		nC
	Q_g(V_{GS}=4.5V)			7.8		
Gate-Source Charge[1,2,5]	Q_{gs}			2.3		
Gate-Drain Charge[1,2,5]	Q_{gd}			3.8		
Turn-On Delay Time[1,2,5]	$t_{d(on)}$	V_{DS} = -15V, V_{GS} = -10V, I_D = -5A , Rg = 3Ω		6.5		nS
Rise Time[1,2,5]	t_r			14.0		
Turn-Off Delay Time[1,2,5]	$t_{d(off)}$			27.9		
Fall Time[1,2,5]	t_f			24.5		
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS						
Continuous Current	I_S				-22	A
Pulsed Current[3]	I_{SM}				-36	
Forward Voltage[1,4]	V_{SD}	I_F = -8A, V_{GS} = 0V			-1.2	V
Reverse Recovery Time[5]	t_{rr}	I_F = -8A, dI_F/dt = 100A / uS		6.7		nS
Peak Reverse Recovery Current[5]	$I_{RM(REC)}$			0.64		A
Reverse Recovery Charge[5]	Q_{rr}			2.4		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

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▪TYPICAL CHARACTERISTICS

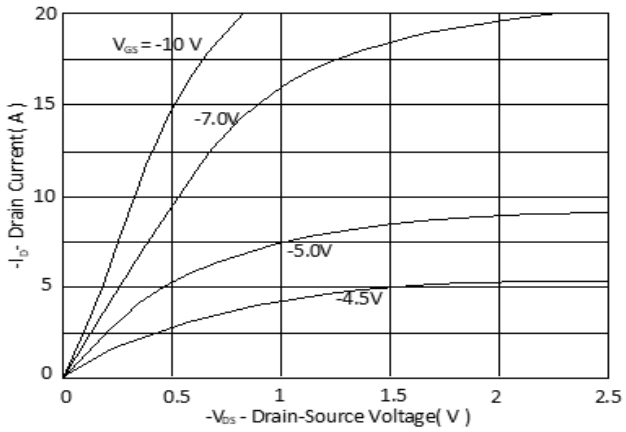


Fig.1 Typical Output Characteristics

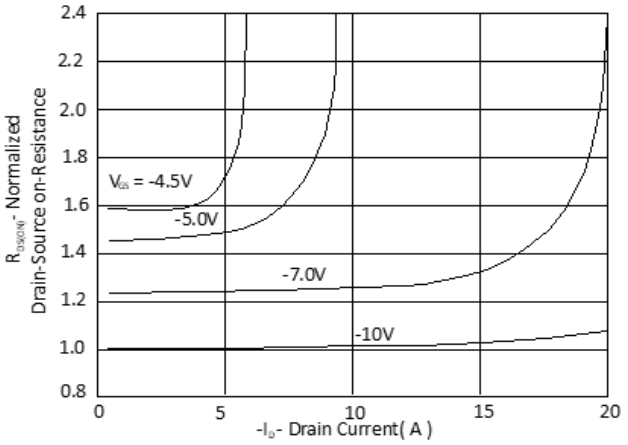


Fig.2 On-Resistance Variation with Drain Current and Gate Voltage

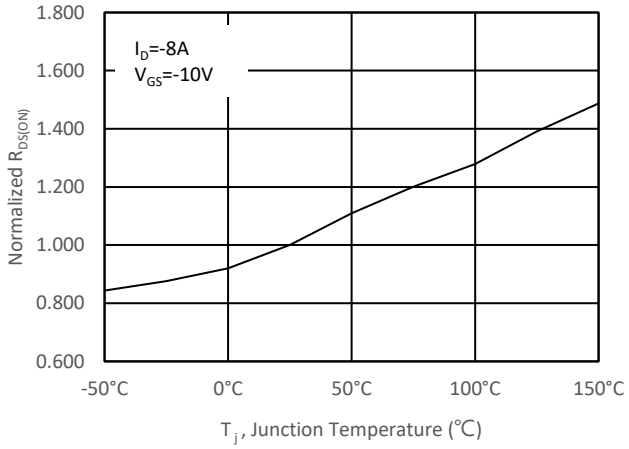
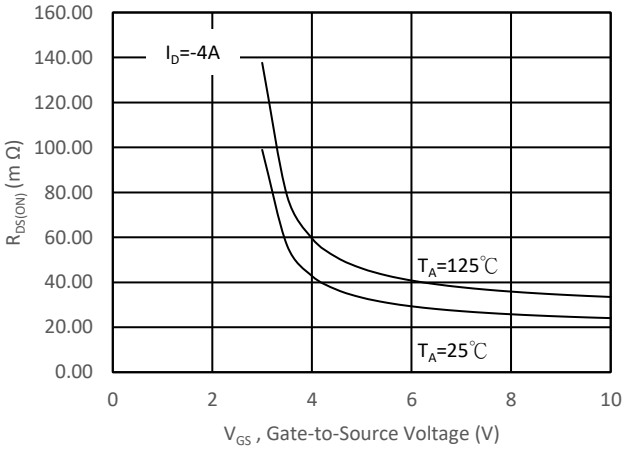


Fig.3 Normalized On-Resistance v.s. Junction Temperature



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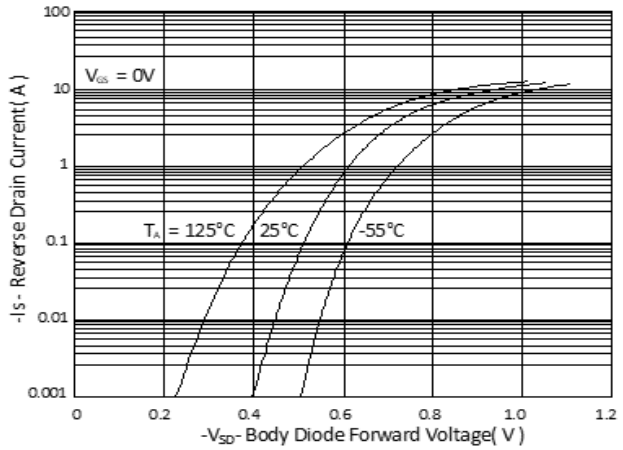


Fig.5 Forward Characteristic of Reverse Diode

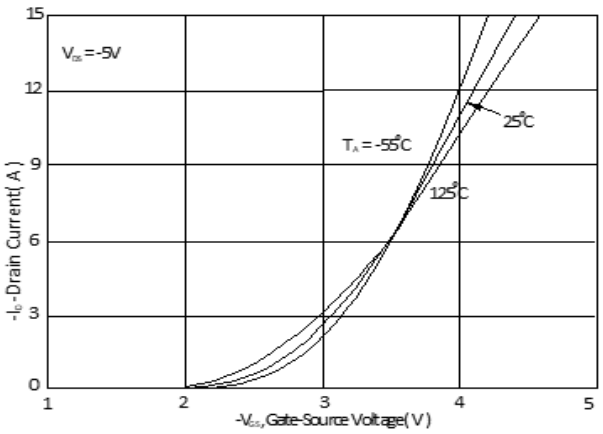


Fig.6 Transfer Characteristics

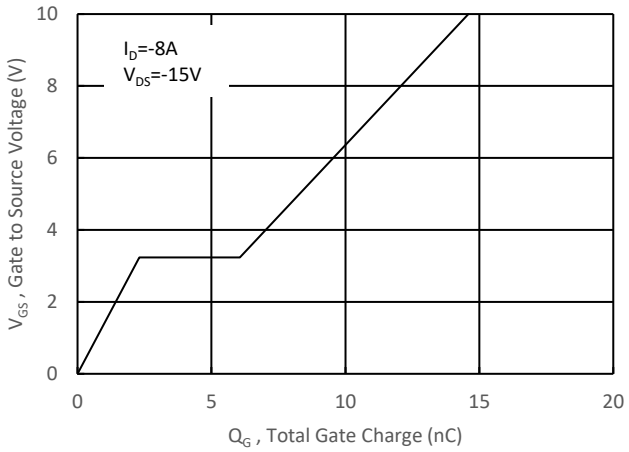


Fig.7 Gate Charge Characteristics

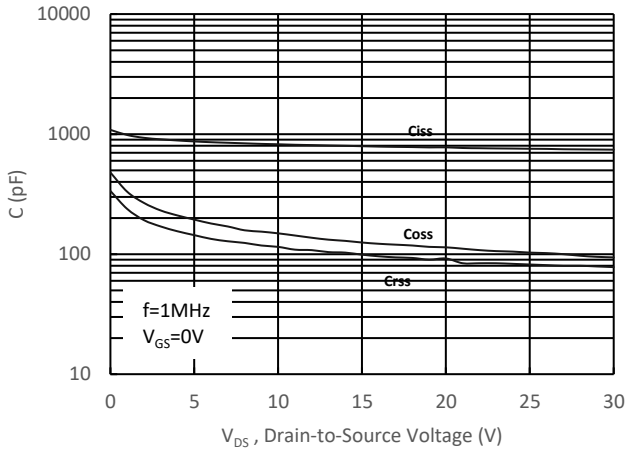
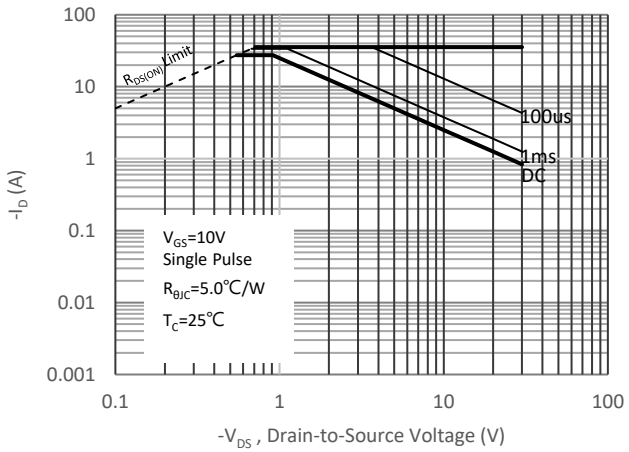


Fig.8 Typical Capacitance Characteristics



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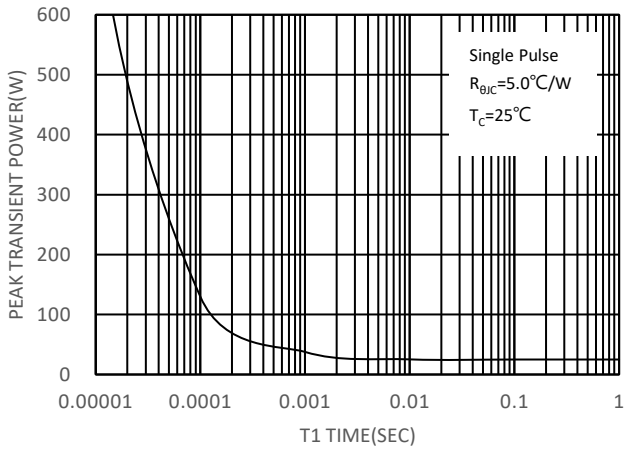


Fig 10. Single Pulse Maximum Power Dissipation

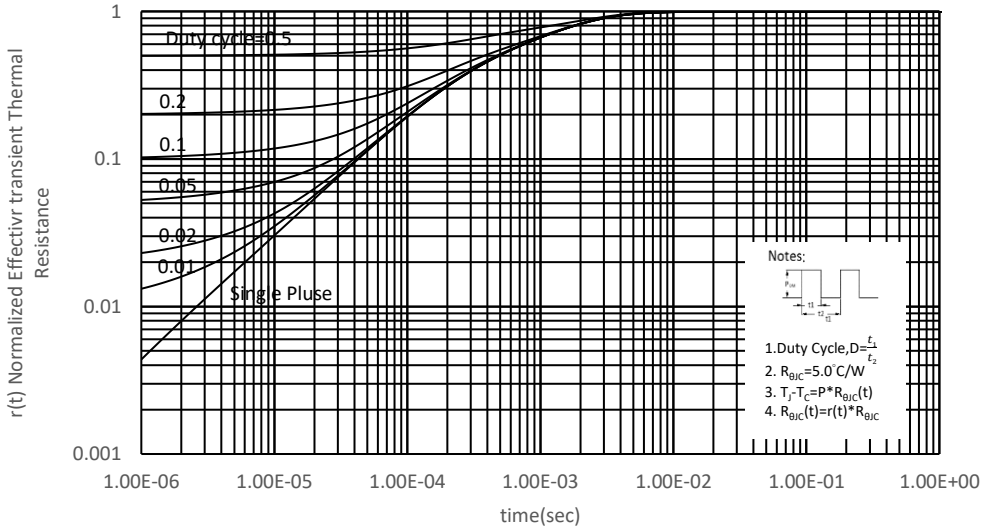


Fig 11. Effective Transient Thermal Impedance

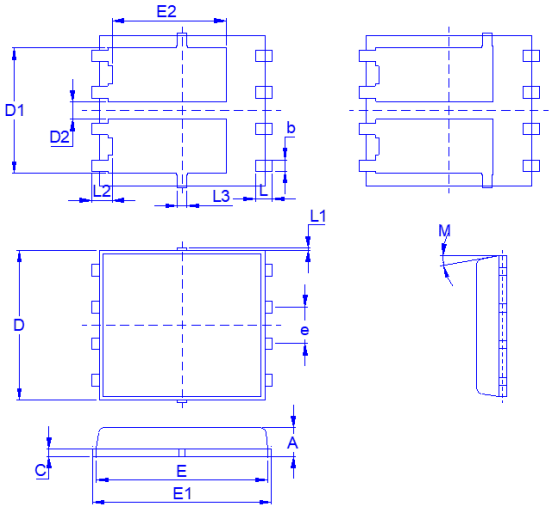
Ordering & Marking Information:

Device Name: EMB18C03H for EDFN 5X6

B18C03: Device Name

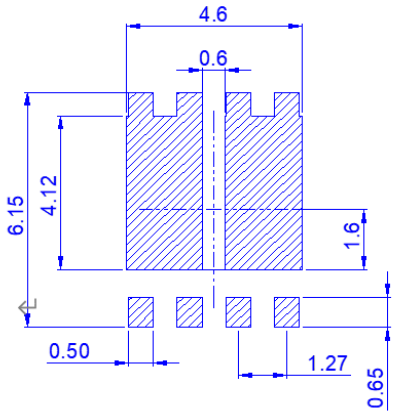
ABCDEFG: Date Code
A: Assembly House
B: Year(A:2008 B:2009 C:2010….)
C: Month(A:01 B:02 C:03 D:04 E:05 F:06 G:07 H:08 I:09 J:10 K:11 L:12)
DEFG: Serial No.

Outline Drawing

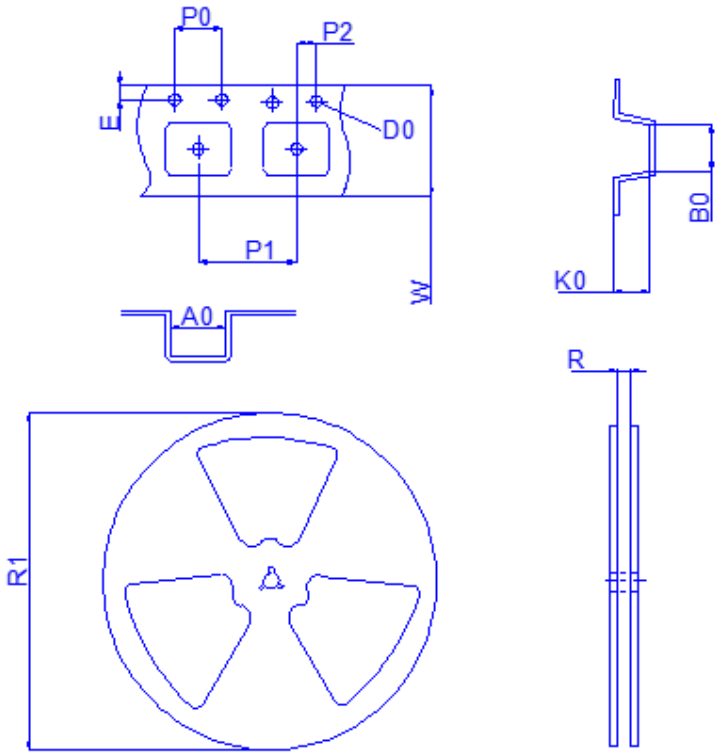


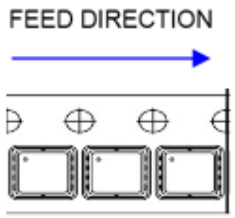
Dimension	A	b	c	D	D1	D2	E	E1	E2	e	L	L1	L2	M
Min.	0.85	0.3	0.15	4.8	3.41	0.47	5.65	5.95	3.3		0.38	0	0.38	0°
Typ.	1.01	0.4	0.2	5	4.01	0.67	5.75	6.05	3.43	1.27	0.55	0.09	0.48	
Max.	1.17	0.5	0.25	5.2	4.61	0.87	5.85	6.15	3.58		0.71	0.18	0.58	12°

Footprint



◆ **Tape&Reel Information:2500pcs/Reel(Dimension in millimeter)**



Package	EDFN5X6
Reel	13"
Device orientation	

Dimension in mm

Dimension	Carrier tape									Reel	
	A0	B0	D0	E	K0	P0	P1	P2	W	R	R1
Typ.	6.4	5.3	1.5	1.8	1.6	4	8	2	12	12.4	330
±	0.2	0.2	0.1	0.1	0.6	0.1	0.1	0.1	0.3	2	2