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

EMB50N10Q

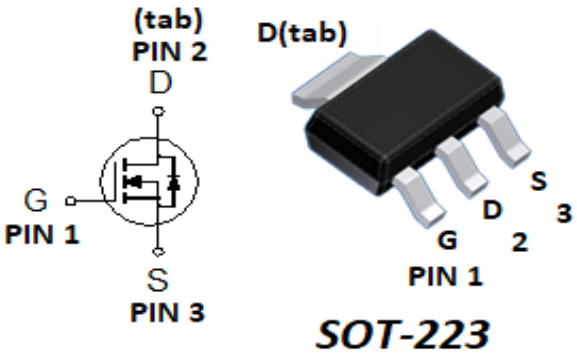
Single N-Channel Logic Level Enhancement Mode Field Effect Transistor

▪Product Summary:

	N-CH
BV_{DSS}	100V
$R_{DSON\ (MAX.)}$@V_{GS}=10V	50mΩ
$R_{DSON\ (MAX.)}$@V_{GS}=4.5V	70mΩ
I_D @T_C=25°C	8.5A
I_D @T_A=25°C	5.0A

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

▪ Pin Description:



▪ 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	8.5	A
	T_C = 100 °C		5	
Continuous Drain Current	T_A = 25 °C	I_D	5	
	T_A = 70 °C		4	
Pulsed Drain Current[1]		I_{DM}	20	
Avalanche Current		I_{AS}	12	
Avalanche Energy	L = 0.1mH	EAS	7.2	mJ
Repetitive Avalanche Energy[2]	L = 0.05mH	EAR	3.6	
Power Dissipation	T_C = 25 °C	P_D	6.3	W
	T_C = 100 °C		2.5	
Power Dissipation	T_A = 25 °C	P_D	2.1	W
	T_A = 70 °C		1.4	
Operating Junction & Storage Temperature Range		T_j, T_{stg}	-55 to 150	°C

▪ 100% UIS testing in condition of VD=50V, L=0.1mH, VG=10V, IL= 7A, Rated VDS=100V N-CH

▪THERMAL RESISTANCE RATINGS

THERMAL RESISTANCE	SYMBOL	TYPICAL	MAXIMUM	UNIT
Junction-to-Lead	$R_{\theta JC}$		20	°C/W
Junction-to-Ambient[3]	$R_{\theta JA}$		58.45	

[1]Pulse width limited by maximum junction temperature.
[2]Duty cycle < 1%
[3]58.45°C / W when mounted on a 1 in^2 pad of 2 oz copper.
[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	100			V
Gate Threshold Voltage[4]	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250μA	1	2	3	
Gate-Body Leakage[4]	I_{GSS}	V_{DS} = 0V, V_{GS} = ±20V			±100	nA
Zero Gate Voltage Drain Current[4]	I_{DSS}	V_{DS} = 80V, V_{GS} = 0V			1	μA
		V_{DS} =70V, V_{GS} =0V, T_J = 125 °C			25	
On-State Drain Current[1]	$I_{D(ON)}$	V_{DS} = 10V, V_{GS} = 10V	8.5			A
Drain-Source On-State Resistance[1,4]	$R_{DS(ON)}$	V_{GS} = 10V, I_D = 7A		38	50	mΩ
		V_{GS} = 4.5V, I_D = 4A		54	70	
DYNAMIC						
Input Capacitance[5]	C_{iss}	V_{GS} = 0V, V_{DS} = 50V, f = 1MHz		3731		pF
Output Capacitance[5]	C_{oss}			86		
Reverse Transfer Capacitance[5]	C_{rss}			48		
Gate Resistance[4,5]	R_g	f = 1MHz		1.1		Ω
Total Gate Charge[1,2,5]	Q_g(V_{GS}=10V)	V_{DS} = 50V, V_{GS} = 10V, I_D = 7A		76		nC
	Q_g(V_{GS}=4.5V)			37		
Gate-Source Charge[1,2,5]	Q_{gs}			11		
Gate-Drain Charge[1,2,5]	Q_{gd}			20		
Turn-On Delay Time[1,2,5]	$t_{d(on)}$	V_{DS} = 50V, V_{GS} = 10V, I_D = 5A , Rg = 6Ω		15.2		nS
Rise Time[1,2,5]	t_r			13.2		
Turn-Off Delay Time[1,2,5]	$t_{d(off)}$			91.8		
Fall Time[1,2,5]	t_f			27		
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS						
Continuous Current	I_S				8.5	A
Pulsed Current[3]	I_{SM}				20	
Forward Voltage[1,4]	V_{SD}	I_F = I_S, V_{GS} = 0V			1.3	V
Reverse Recovery Time[5]	t_{rr}	I_F = I_S, dI_F/dt = 100A / μS		41.3		nS
Reverse Recovery Charge[5]	Q_{rr}			77.1		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

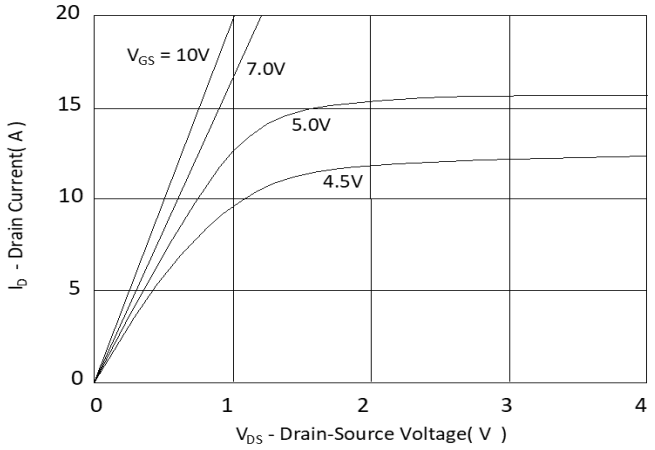


Fig.1 Typical Output Characteristics

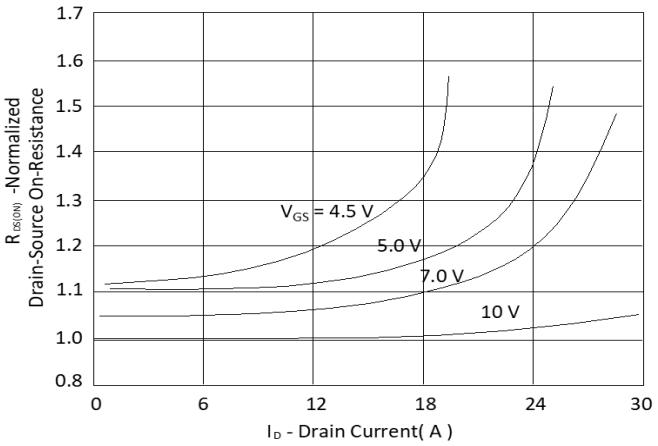


Fig.2 On-Resistance Variation with Drain Current and Gate Voltage

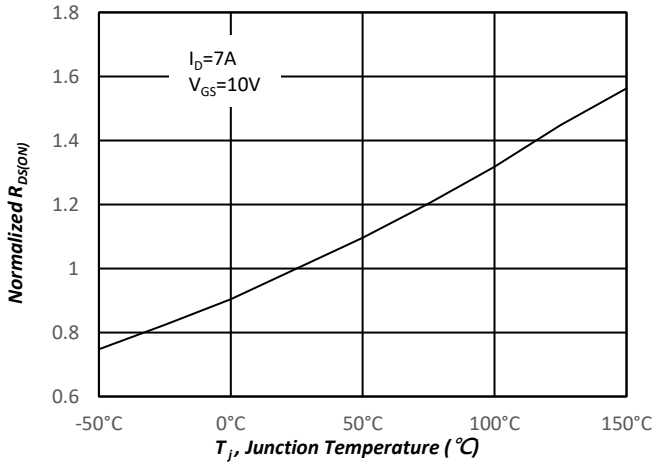


Fig.3 Normalized On-Resistance v.s. Junction Temperature

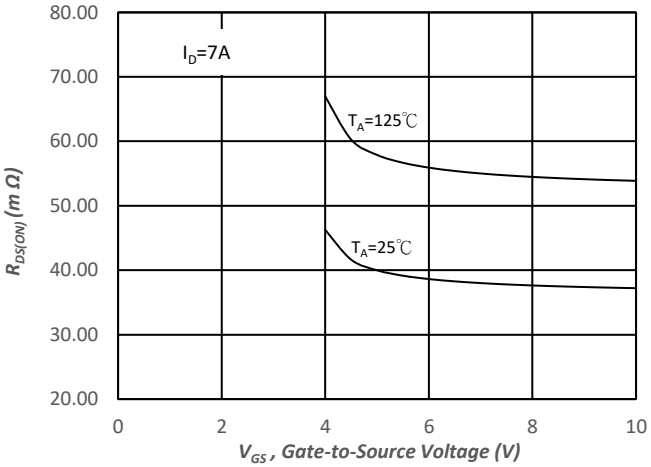


Fig.4 On-Resistance v.s. Gate Voltage

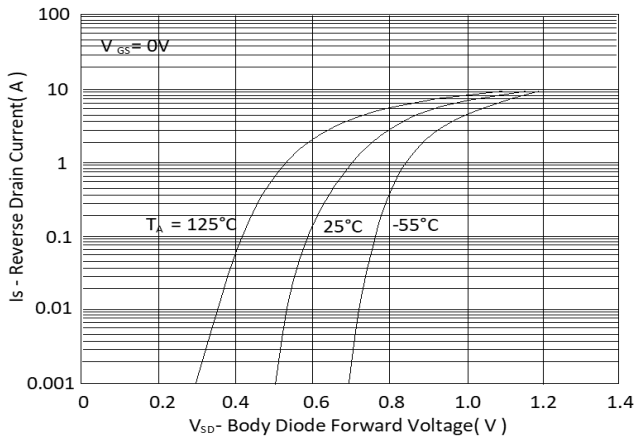


Fig.5 Forward Characteristic of Reverse Diode

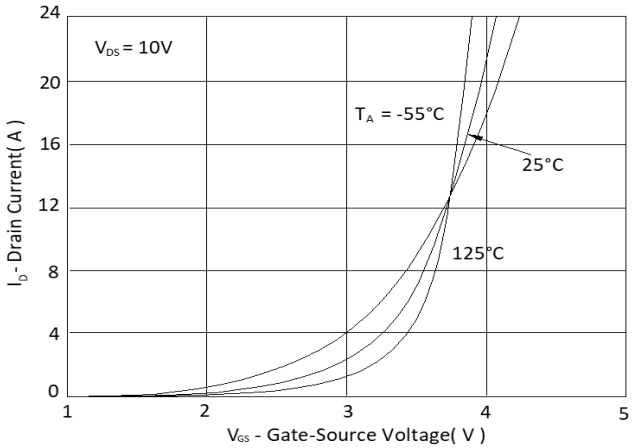


Fig.6 Transfer Characteristics

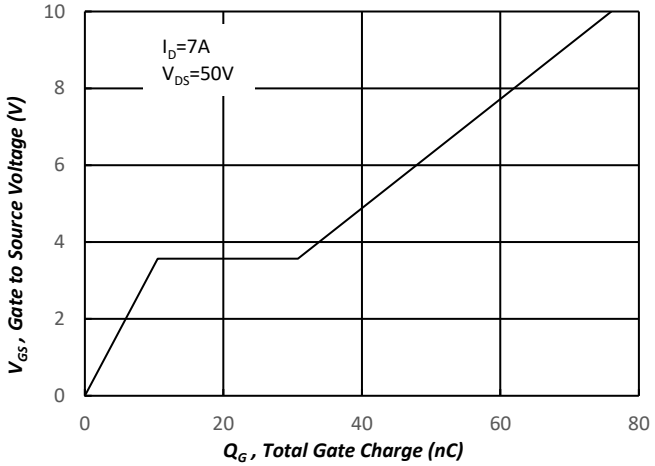


Fig.7 Gate Charge Characteristics

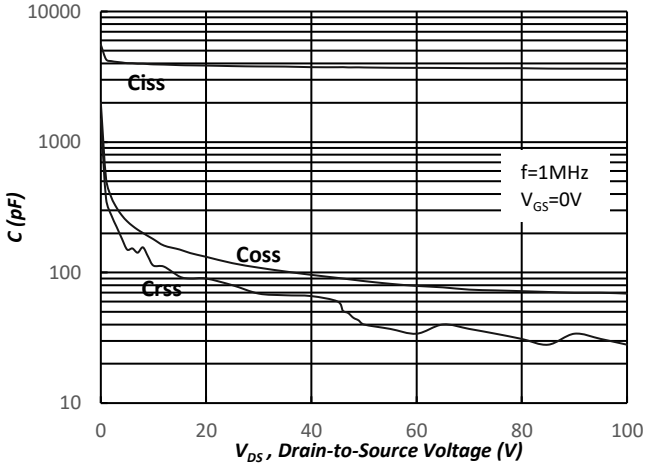


Fig.8 Typical Capacitance Characteristics

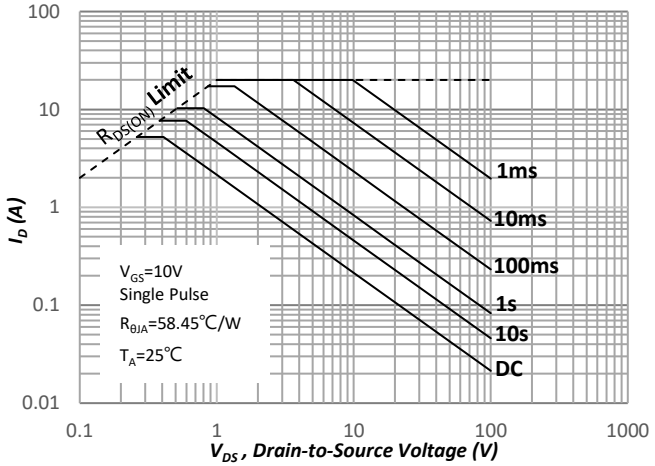


Fig 9. Maximum Safe Operating Area

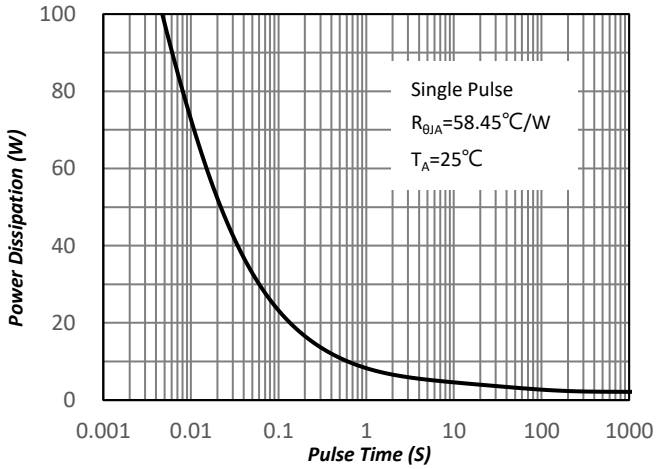


Fig 10. Single Pulse Maximum Power Dissipation

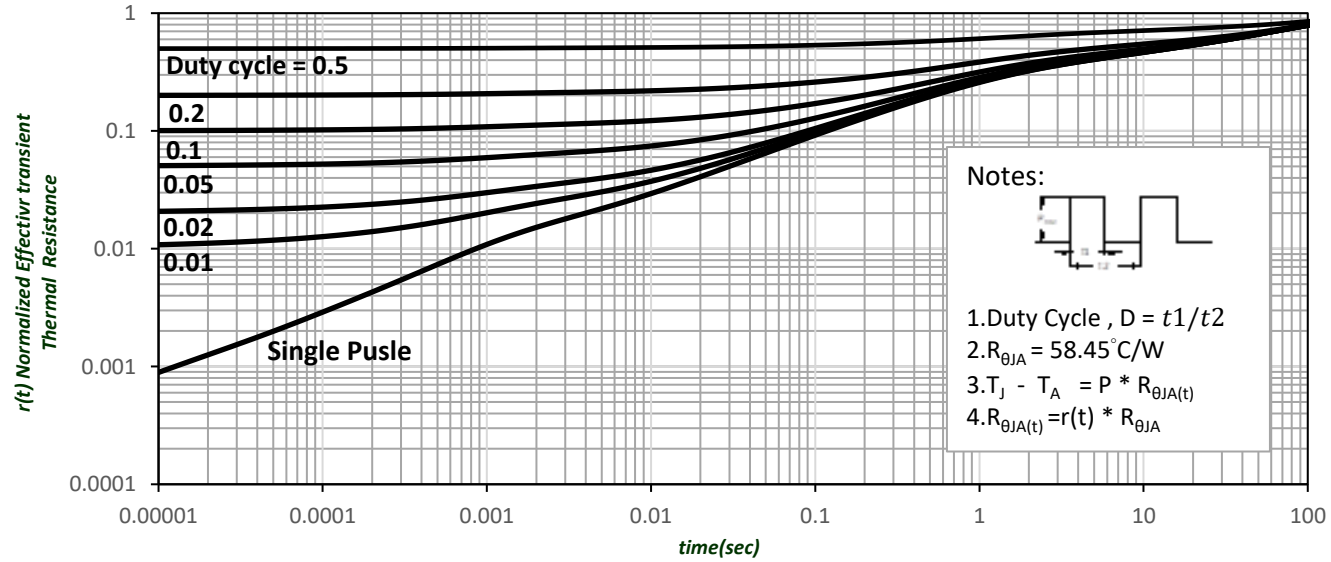
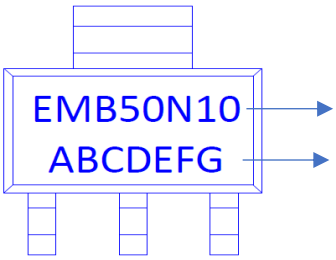


Fig 11. Effective Transient Thermal Impedance

Ordering & Marking Information:

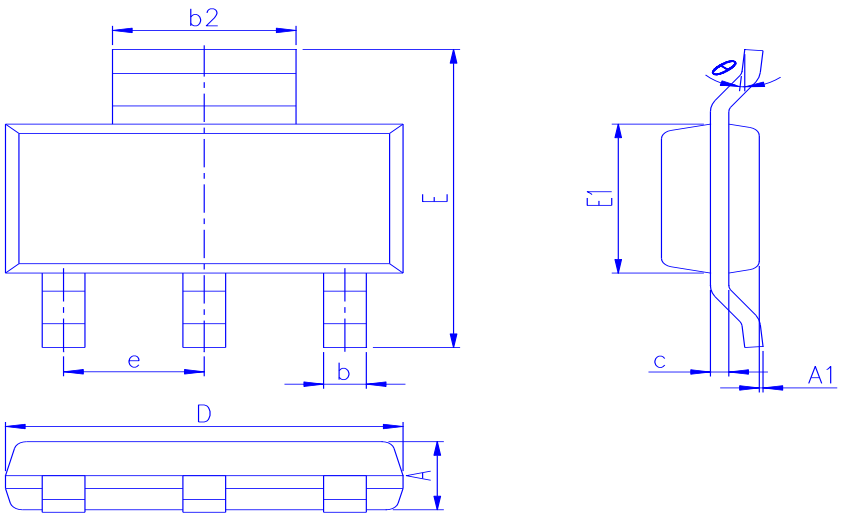
Device Name: EMB50N10Q for SOT-223



EMB50N10: Device Name

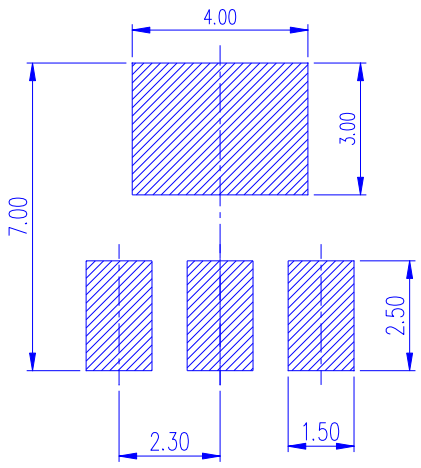
ABCDEFG: Date Code
A: Assembly House
B: Year(A:2008 B:2009 C:2010….)
C: Month(A:01 B:02 C:03 D:04 E:05 F:06 G:07 H:08 I:09 J:10 K:11 L:12)
DEFG: Serial No.

Outline Drawing

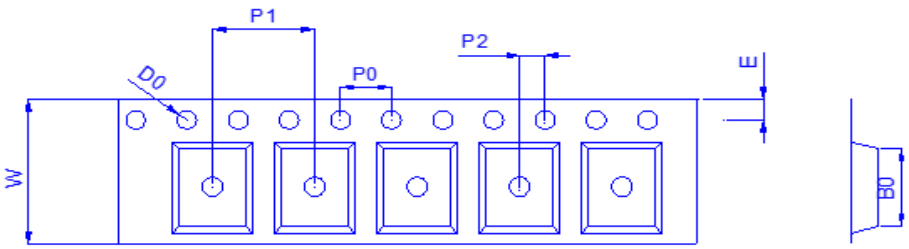


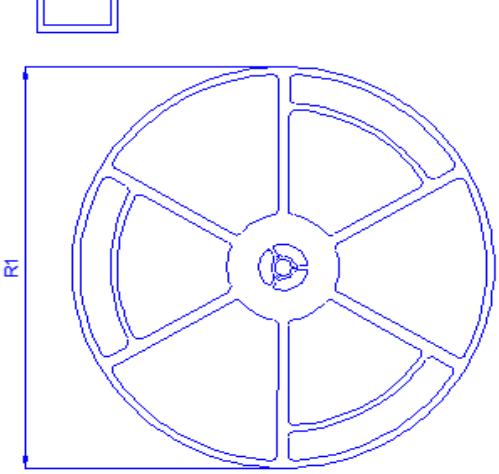
Dimension	E	b2	A1	θ	b	c	e	D	E1	A
Min	6.7	2.9	0.02	0°	0.6	0.23		6.3	3.3	1.4
Typ.	7	3	0.06		0.72	0.29	2.3	6.5	3.5	1.6
Max	7.3	3.1	0.1	10°	0.84	0.35		6.7	3.7	1.8

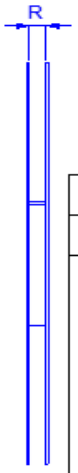
Footprint

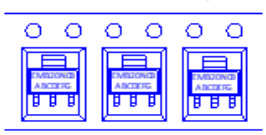


◆ **Tape&Reel Information:2500pcs/Reel**







產品別	SOT-223
Reel尺寸	13”
編帶方式	FEED DIRECTION 

Dimension in mm

Dimension	Carrier tape									Reel	
	A0	B0	D0	E	K0	P0	P1	P2	W	R	R1
Typ.	6.7	7.3	1.5	1.75	2	4	8	2	12	16.5	330
±	0.4	0.3	0.1	0.1	0.3	0.1	0.1	0.1	0.3	3	2