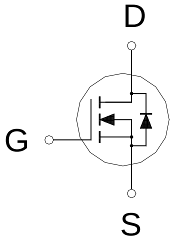
杰力科技股份有限公司
Excelliance MOS Corporation

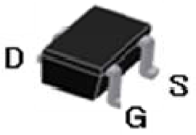
EMBJ7N25J

N-Channel Logic Level Enhancement Mode Field Effect Transistor

Product Summary:

BV_{DSS}	250V
$R_{DSON\ (MAX.)}$	1.7Ω
I_D	0.4A





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	0.4	A
	T_C = 100 °C		0.25	
Pulsed Drain Current[1]		I_{DM}	1.6	
Power Dissipation	T_A = 25 °C	P_D	1.25	W
	T_A = 70 °C		0.8	
Operating Junction & Storage Temperature Range		T_j, T_{stg}	-55 to 150	°C

THERMAL RESISTANCE RATINGS

THERMAL RESISTANCE	SYMBOL	TYPICAL	MAXIMUM	UNIT
Junction-to- Ambient	$R_{\theta JA}$		100	°C / W

[1] Pulse width limited by maximum junction temperature.

[2] Duty cycle ≤ 1%

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

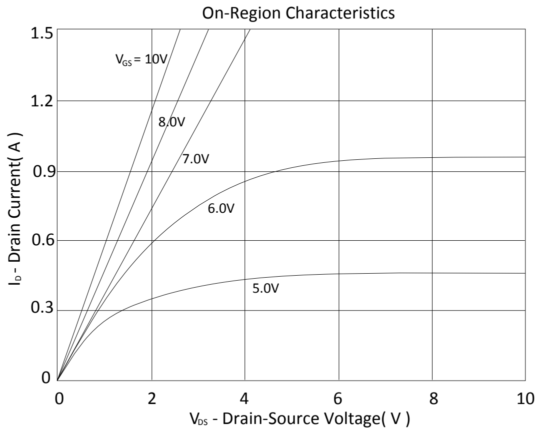
PARAMETER	SYMBOL	TEST CONDITIONS	LIMITS			UNIT
			MIN	TYP	MAX	
STATIC						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D = 10mA	250			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250μA	1.0	2.0	3.0	
Gate-Body Leakage	I_{GSS}	V_{DS} = 0V, V_{GS} = ±20V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 200V, V_{GS} = 0V			1	μA
		V_{DS} = 200V, V_{GS} = 0V, T_J = 125 °C			25	
On-State Drain Current[1]	$I_{D(ON)}$	V_{DS} = 10V, V_{GS} = 10V	0.4			A
Drain-Source On-State Resistance[1]	$R_{DS(ON)}$	V_{GS} = 10V, I_D = 0.2A		1.35	1.7	Ω
		V_{GS} = 5V, I_D = 0.1A		1.5	2.0	
Forward Transconductance[1]	g_{fs}	V_{DS} = 50V, I_D = 0.2A		2.0		S
DYNAMIC						
Input Capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = 25V, f = 1MHz		680		pF
Output Capacitance	C_{oss}			15		
Reverse Transfer Capacitance	C_{rss}			13		
Gate Resistance	R_g	V_{GS} = 15mV, V_{DS} = 0V, f = 1MHz		3.0		Ω
Total Gate Charge[1,2]	Q_g	V_{DS} = 200V, V_{GS} = 10V, I_D = 0.2A		17.8		nC
Gate-Source Charge[1,2]	Q_{gs}			2.2		
Gate-Drain Charge[1,2]	Q_{gd}			4.4		
Turn-On Delay Time[1,2]	$t_{d(on)}$	V_{DS} = 125V, I_D = 0.1A, V_{GS} = 10V, R_G = 6Ω		10		nS
Rise Time[1,2]	t_r			40		
Turn-Off Delay Time[1,2]	$t_{d(off)}$			12		
Fall Time[1,2]	t_f			20		
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (T_C = 25 °C)						
Continuous Current	I_S				0.5	A
Pulsed Current[3]	I_{SM}				2	
Forward Voltage[1]	V_{SD}	I_F = I_S, V_{GS} = 0V			1.3	V

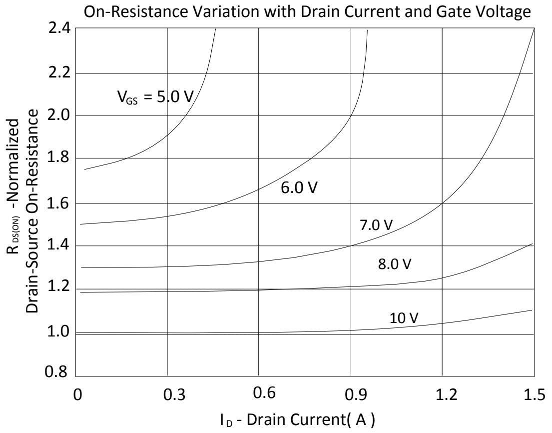
[1] Pulse test : Pulse Width ≤ 300 μsec, Duty Cycle ≤ 2%.

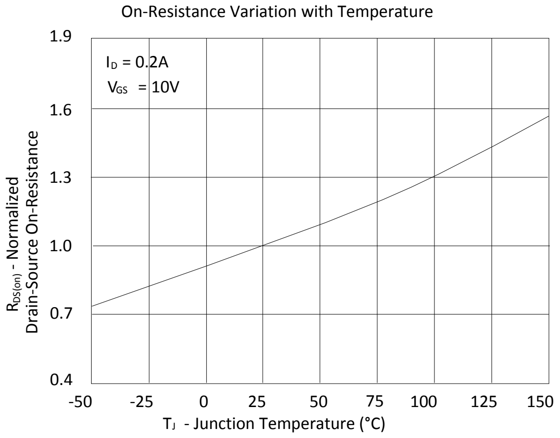
[2] Independent of operating temperature.

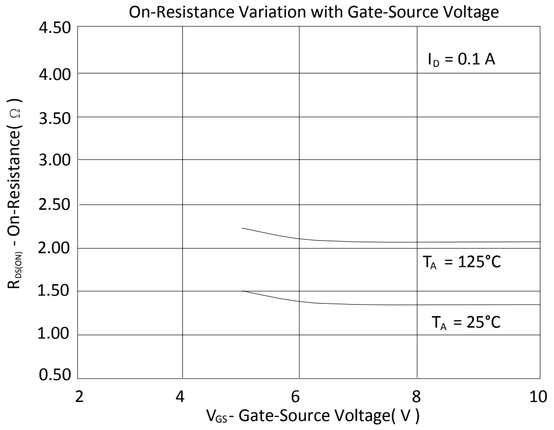
[3] Pulse width limited by maximum junction temperature.

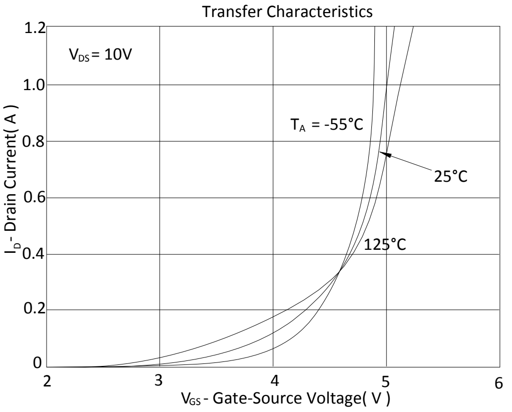
TYPICAL CHARACTERISTICS

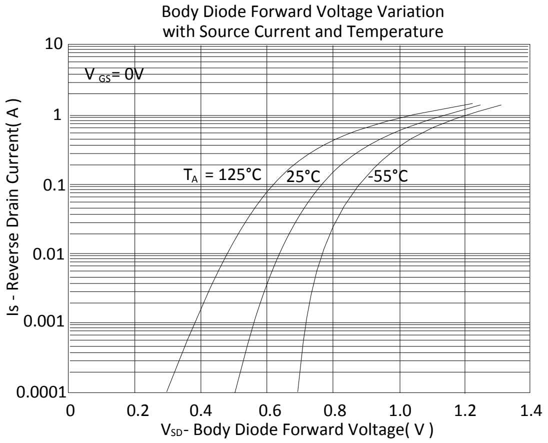

On-Region Characteristics

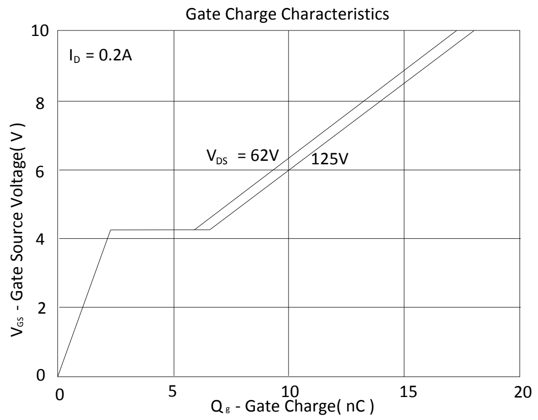

On-Resistance Variation with Drain Current and Gate Voltage

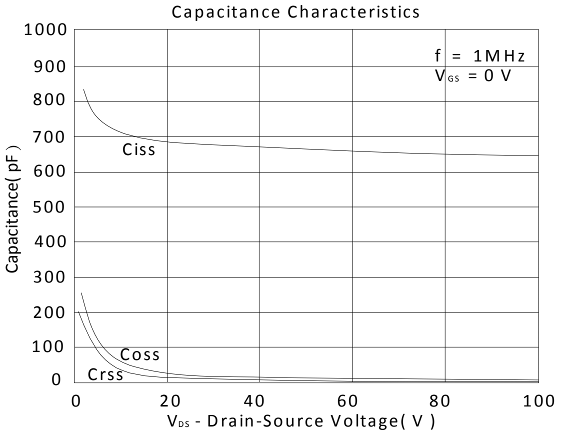

On-Resistance Variation with Temperature

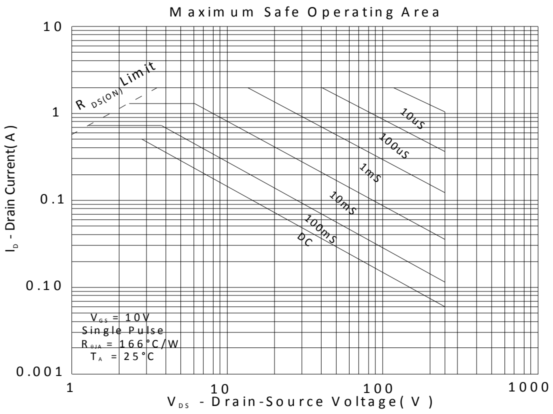

On-Resistance Variation with Gate-Source Voltage

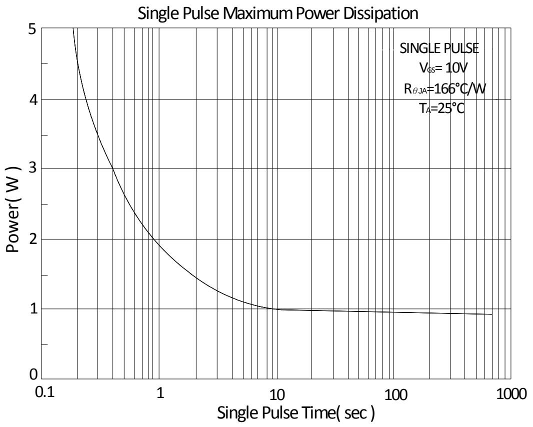

Transfer Characteristics

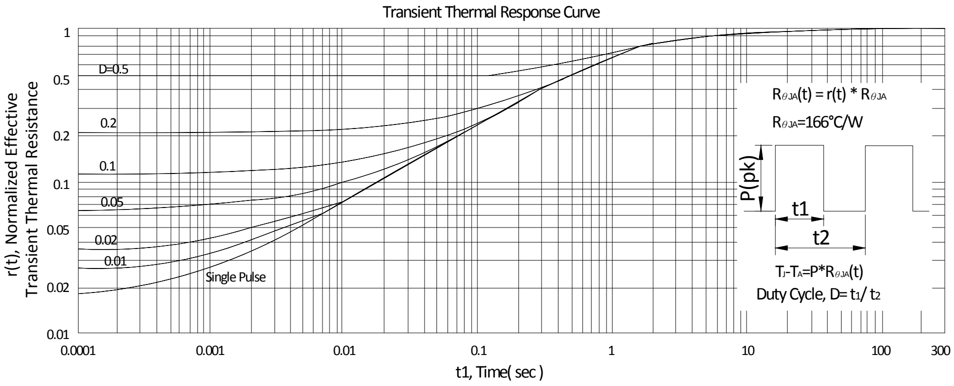

Body Diode Forward Voltage Variation
with Source Current and Temperature


Gate Charge Characteristics
I_D = 0.2A
V_{DS} = 62V
125V
V_{GS} - Gate Source Voltage(V)
Q_g - Gate Charge(nC)
0
2
4
6
8
10
0
5
10
15
20


Capacitance Characteristics
f = 1MHz
V_{GS} = 0 V
Ciss
Coss
Crss
Capacitance(pF)
V_{DS} - Drain-Source Voltage(V)
0
100
200
300
400
500
600
700
800
900
1000
0
20
40
60
80
100

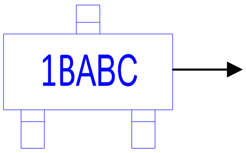

Maximum Safe Operating Area
R DS(ON) Limit
10us
100us
1ms
10ms
100ms
DC
V_{GS} = 10V
Single Pulse
$R_{\theta JA}$ = 166°C/W
T_A = 25°C
I_D - Drain Current(A)
V_{DS} - Drain-Source Voltage(V)
10
1
0.1
0.10
0.001
1
10
100
1000


Single Pulse Maximum Power Dissipation
SINGLE PULSE
V_{GS}= 10V
$R_{\theta JA}$=166°C/W
T_A=25°C
Power(W)
Single Pulse Time(sec)
0
1
2
3
4
5
0.1
1
10
100
1000


Transient Thermal Response Curve
D=0.5
0.2
0.1
0.05
0.02
0.01
Single Pulse
$R_{\theta JA}(t) = r(t) * R_{\theta JA}$
$R_{\theta JA}$=166°C/W
P(pk)
t1
t2
$T_J-T_A=P*R_{\theta JA}(t)$
Duty Cycle, D= t_1/t_2
r(t), Normalized Effective Transient Thermal Resistance
t1, Time(sec)
1
0.5
0.2
0.1
0.05
0.02
0.01
0.0001
0.001
0.01
0.1
1
10
100
300

Ordering & Marking Information:

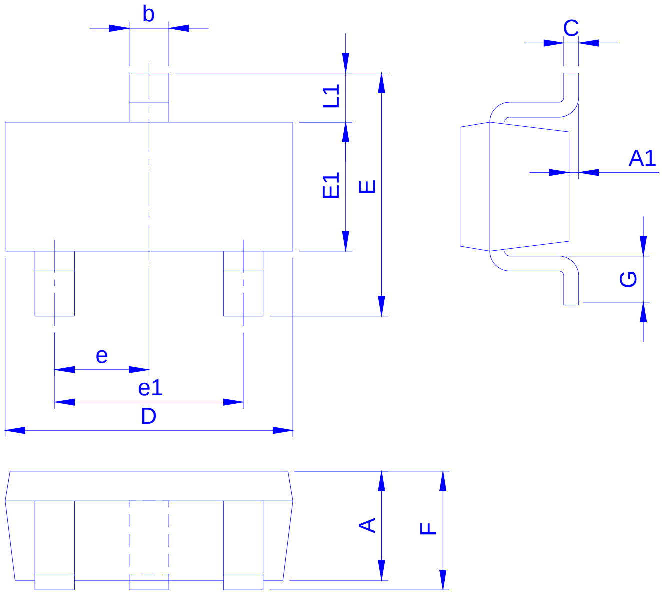
Device Name: EMBJ7N25J for SOT-23



1B: Device Code, 1B for EMBJ7N25J

ABC: Date Code

Outline Drawing



Dimension in mm

Dimension	A	A1	A2	b	C	D	E	E1	e	e1	F	G	L1
Min.	0.7	0		0.35	0.1	2.8	2.6	1.5	0.9		0.8	0.3	0.55
Typ.						2.9	2.8	1.6	0.95	1.9			
Max.	1.12	0.1		0.5	0.2	3	3	1.7	1		1.2	0.6	0.65

Footprint