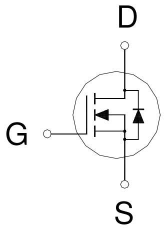
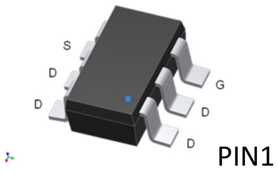
N-Channel Logic Level Enhancement Mode Field Effect Transistor

Product Summary:

BV_{DSS}	30V
R_{DSON} (MAX.)	27mΩ
I_D	6A

N-Channel MOSFET





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_A = 25 °C	I_D	6	A
	T_A = 70 °C		4	
Pulsed Drain Current[1]		I_{DM}	24	
Power Dissipation	T_A = 25 °C	P_D	1.92	W
	T_A = 70 °C		1.23	
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[3]	$R_{\theta JA}$ (T ≤ 10sec)		65	°C / W
	$R_{\theta JA}$ (Steady State)		100	

[1] Pulse width limited by maximum junction temperature.

[2] Duty cycle ≤ 1%

[3] Pulse width limited by maximum junction temperature.

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	30			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250μA	1.0	1.7	3.0	
Gate-Body Leakage	I_{GSS}	V_{DS} = 0V, V_{GS} = ±20V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 24V, V_{GS} = 0V			1	μA
		V_{DS} = 20V, V_{GS} = 0V, T_J = 125 °C			10	
On-State Drain Current[1]	$I_{D(ON)}$	V_{DS} = 5V, V_{GS} = 10V	6			A
Drain-Source On-State Resistance[1]	$R_{DS(ON)}$	V_{GS} = 10V, I_D = 6A		21	27	mΩ
		V_{GS} = 4.5V, I_D = 5A		32	40	
Forward Transconductance[1]	g_{fs}	V_{DS} = 5V, I_D = 6A		12		S
DYNAMIC						
Input Capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = 15V, f = 1MHz		522		pF
Output Capacitance	C_{oss}			105		
Reverse Transfer Capacitance	C_{rss}			82		
Total Gate Charge[1,2]	Q_g	V_{DS} = 15V, V_{GS} = 10V, I_D = 6A		10.9		nC
Gate-Source Charge[1,2]	Q_{gs}			1.75		
Gate-Drain Charge[1,2]	Q_{gd}			3.4		
Turn-On Delay Time[1,2]	$t_{d(on)}$	V_{DS} = 15V, I_D = 1A, V_{GS} = 10V, R_{GS} = 6Ω		8		nS
Rise Time[1,2]	t_r			7		
Turn-Off Delay Time[1,2]	$t_{d(off)}$			15		
Fall Time[1,2]	t_f			10		
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (T_C = 25 °C)						
Continuous Current	I_S				2	A
Pulsed Current[3]	I_{SM}				8	
Forward Voltage[1]	V_{SD}	I_F = I_S, V_{GS} = 0V			1.2	V

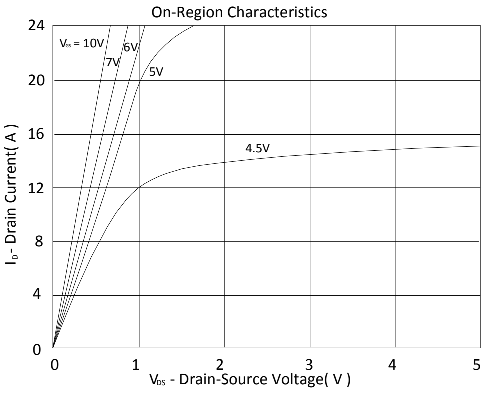
[1] Pulse test : Pulse Width ≤ 300 μsec, Duty Cycle ≤ 2%.

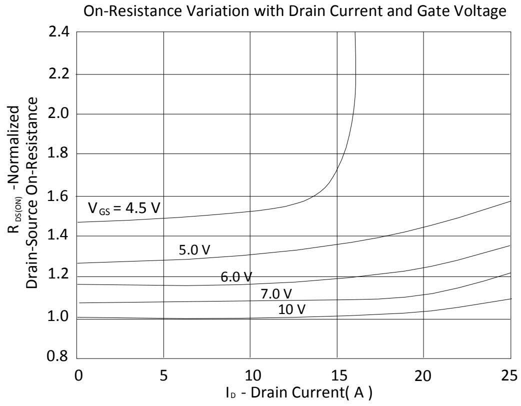
[2] Independent of operating temperature.

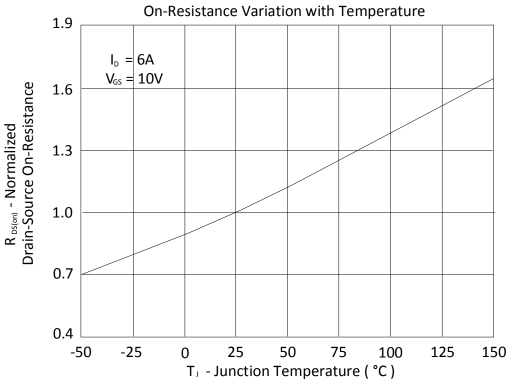
[3] Pulse width limited by maximum junction temperature.

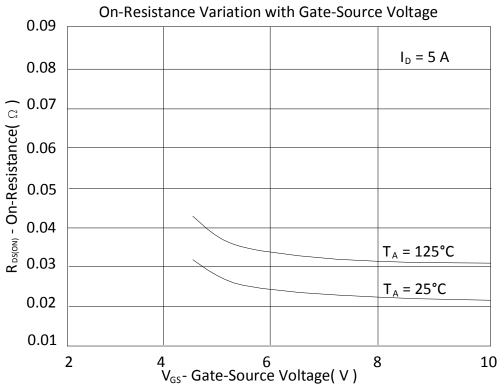
EMC will review datasheet by quarter, and update new version.

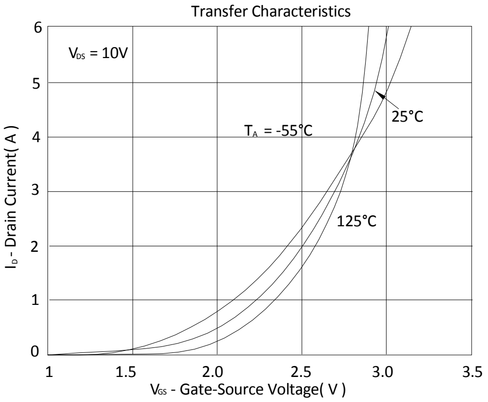
TYPICAL CHARACTERISTICS

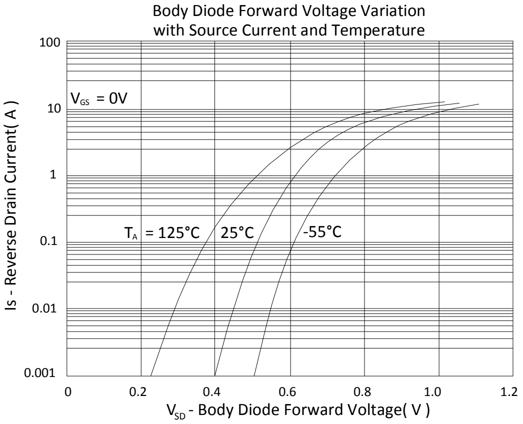

On-Region Characteristics

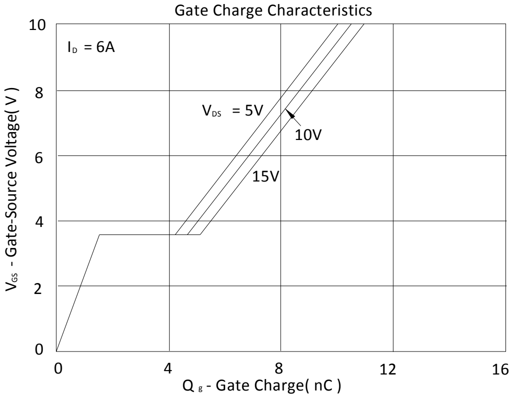

On-Resistance Variation with Drain Current and Gate Voltage

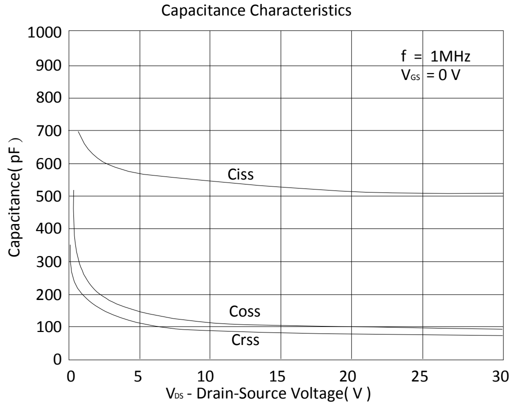

On-Resistance Variation with Temperature

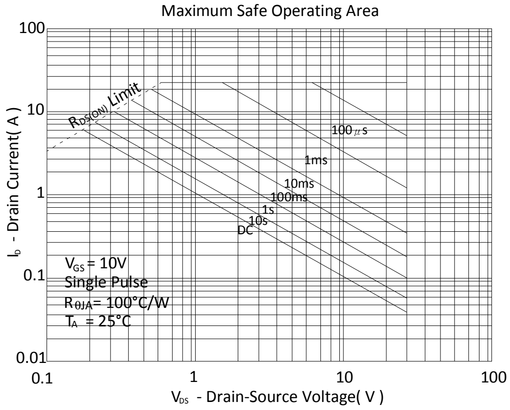

On-Resistance Variation with Gate-Source Voltage

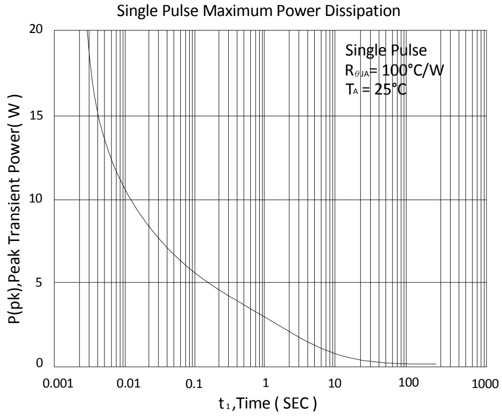

Transfer Characteristics

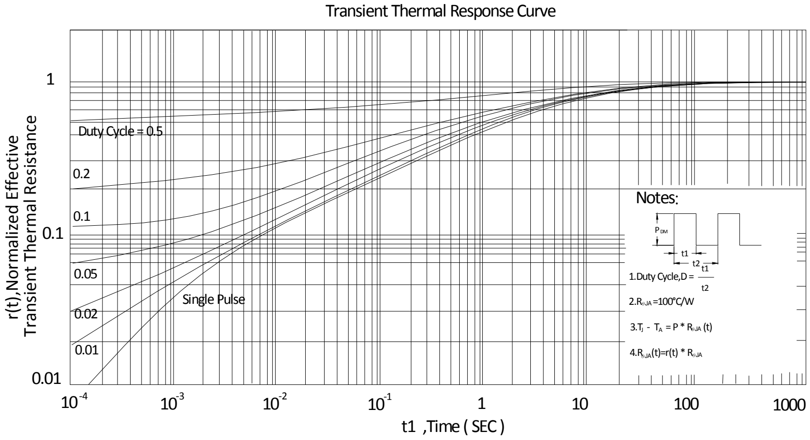

Body Diode Forward Voltage Variation
with Source Current and Temperature


Gate Charge Characteristics
I_D = 6A
V_{DS} = 5V
10V
15V
V_{GS} - Gate-Source Voltage(V)
Q g - Gate Charge(nC)
0
2
4
6
8
10
0
4
8
12
16


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
5
10
15
20
25
30

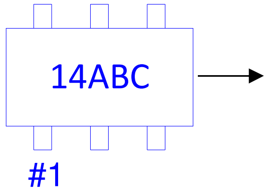

Maximum Safe Operating Area
$R_{DS(ON)}$ Limit
100 μs
1ms
10ms
100ms
1s
10s
DC
V_{GS} = 10V
Single Pulse
$R_{\theta JA}$ = 100°C/W
T_A = 25°C
I_D - Drain Current(A)
V_{DS} - Drain-Source Voltage(V)
100
10
1
0.1
0.01
0.1
1
10
100


Single Pulse Maximum Power Dissipation
Single Pulse
$R_{\theta JA}$ = 100°C/W
T_A = 25°C
P(pk),Peak Transient Power(W)
t_1 ,Time (SEC)
20
15
10
5
0
0.001
0.01
0.1
1
10
100
1000


Transient Thermal Response Curve
Duty Cycle = 0.5
0.2
0.1
0.05
0.02
0.01
Single Pulse
Notes:
P_{DM}
t1
t2
1.Duty Cycle,D = $\frac{t1}{t2}$
2.$R_{\theta JA}$ =100°C/W
3.T_J - T_A = P * $R_{\theta JA}$ (t)
4.$R_{\theta JA}$(t)=r(t) * $R_{\theta JA}$
r(t),Normalized Effective Transient Thermal Resistance
t1 ,Time (SEC)
1
0.1
0.01
10^{-4}
10^{-3}
10^{-2}
10^{-1}
1
10
100
1000

Ordering & Marking Information:

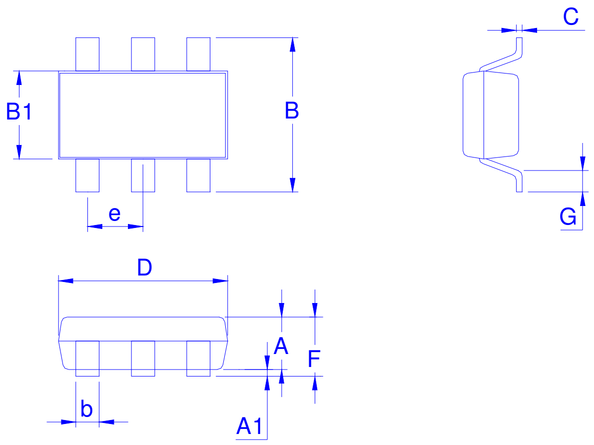
Device Name: EMB27N03K for TSOT23-6



14: Device Code, 14 for EMB27N03K

ABC: Date Code

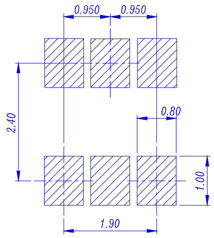
Outline Drawing



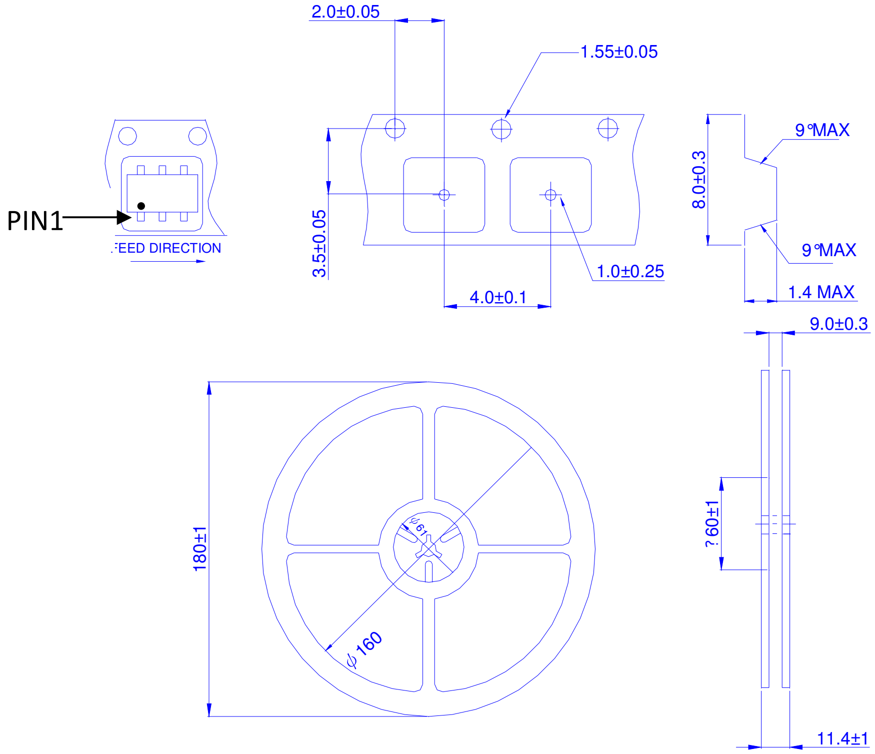
Dimension in mm

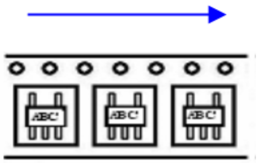
Dimension	A	A1	B	B1	b	C	D	e	F	G
Min.	0.70	0	2.50	1.50	0.30	0.08	2.70		0.70	0.30
Typ.	0.95		2.80	1.60	0.40		2.90	0.95		
Max.	1.00	0.10	3.10	1.70	0.50	0.20	3.10		1.10	0.60

Footprint



◆ Tape&Reel Information:3000pcs/Reel(Dimension in millimeter)



產品別	TSOT23-6
Reel 尺寸	7”
編帶方式	FEED DIRECTION 
前空格	50
後空格	50
裝箱數	
滿捲數量	3K
捲/內盒比	5：1
內盒滿箱數	15K
內/外箱比	12：1
外箱滿箱數	180K