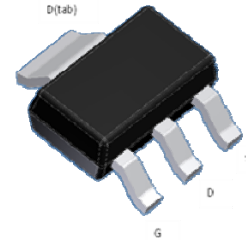


N-Channel Logic Level Enhancement Mode Field Effect Transistor

Product Summary:

BV_{DSS}	100V
$R_{DS(on)} (MAX.)$	110m Ω
I_D	4.5A



UIS, Rg 100% Tested

Pb-Free Lead Plating & Halogen Free



ABSOLUTE MAXIMUM RATINGS ($T_C = 25\text{ }^\circ\text{C}$ Unless Otherwise Noted)

PARAMETERS/TEST CONDITIONS		SYMBOL	LIMITS	UNIT
Gate-Source Voltage		V_{GS}	± 20	V
Continuous Drain Current	$T_C = 25\text{ }^\circ\text{C}$	I_D	4.5	A
	$T_C = 100\text{ }^\circ\text{C}$		3	
Pulsed Drain Current ¹		I_{DM}	18	
Avalanche Current		I_{AS}	5	
Avalanche Energy	$L = 0.1\text{mH}, I_D=5\text{A}, R_G=25\Omega$	E_{AS}	1.25	mJ
Repetitive Avalanche Energy ²	$L = 0.05\text{mH}$	E_{AR}	0.625	
Power Dissipation	$T_C = 25\text{ }^\circ\text{C}$	P_D	6.25	W
	$T_C = 100\text{ }^\circ\text{C}$		2.5	
Operating Junction & Storage Temperature Range		T_{j}, T_{stg}	-55 to 150	$^\circ\text{C}$

THERMAL RESISTANCE RATINGS

THERMAL RESISTANCE	SYMBOL	TYPICAL	MAXIMUM	UNIT
Junction-to-Case	$R_{\theta JC}$		20	$^\circ\text{C}/\text{W}$
Junction-to-Ambient	$R_{\theta JA}$		150	

¹Pulse width limited by maximum junction temperature.

²Duty cycle $\leq 1\%$

ELECTRICAL CHARACTERISTICS ($T_c = 25\text{ }^\circ\text{C}$, Unless Otherwise Noted)

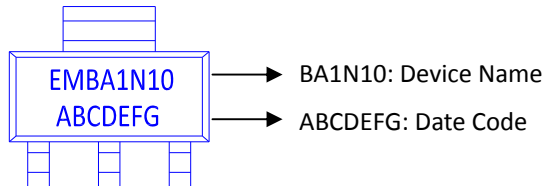
PARAMETER	SYMBOL	TEST CONDITIONS	LIMITS			UNIT
			MIN	TYP	MAX	
STATIC						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 250\mu A$	100			V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	1.0	2.0	3.0	
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0V, V_{GS} = \pm 20V$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 80V, V_{GS} = 0V$			1	μA
		$V_{DS} = 70V, V_{GS} = 0V, T_J = 125\text{ }^\circ\text{C}$			25	
On-State Drain Current ¹	$I_{D(ON)}$	$V_{DS} = 10V, V_{GS} = 10V$	4.5			A
Drain-Source On-State Resistance ¹	$R_{DS(ON)}$	$V_{GS} = 10V, I_D = 4.5A$		90	110	$m\Omega$
		$V_{GS} = 4.5V, I_D = 2A$		100	130	
Forward Transconductance ¹	g_{fs}	$V_{DS} = 5V, I_D = 4.5A$		9		S
DYNAMIC						
Input Capacitance	C_{iss}	$V_{GS} = 0V, V_{DS} = 25V, f = 1MHz$		645		pF
Output Capacitance	C_{oss}			73		
Reverse Transfer Capacitance	C_{rss}			24		
Gate Resistance	R_g	$V_{GS} = 15mV, V_{DS} = 0V, f = 1MHz$		4.5		Ω
Total Gate Charge ^{1,2}	Q_g	$V_{DS} = 80V, V_{GS} = 10V,$ $I_D = 4.5A$		13		nC
Gate-Source Charge ^{1,2}	Q_{gs}			1.9		
Gate-Drain Charge ^{1,2}	Q_{gd}			4.8		
Turn-On Delay Time ^{1,2}	$t_{d(on)}$	$V_{DS} = 50V,$ $I_D = 1A, V_{GS} = 10V, R_{GS} = 6\Omega$		10		nS
Rise Time ^{1,2}	t_r			10		
Turn-Off Delay Time ^{1,2}	$t_{d(off)}$			20		
Fall Time ^{1,2}	t_f			15		
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS ($T_c = 25\text{ }^\circ\text{C}$)						
Continuous Current	I_S				4.5	A
Pulsed Current ³	I_{SM}				18	
Forward Voltage ¹	V_{SD}	$I_F = 1A, V_{GS} = 0V$			1.0	V
Reverse Recovery Time	t_{rr}	$I_F = 4.5A, di_F/dt = 100A / \mu S$		45		nS
Reverse Recovery Charge	Q_{rr}			80		nC

¹Pulse test : Pulse Width $\leq 300\text{ }\mu\text{sec}$, Duty Cycle $\leq 2\%$.²Independent of operating temperature.

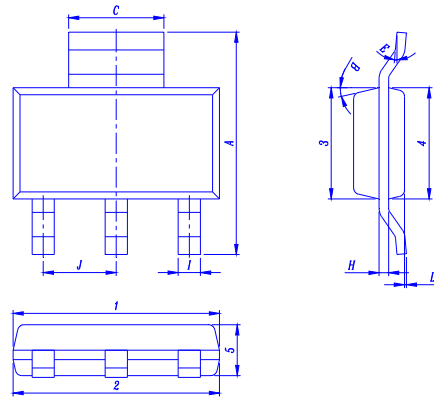
³Pulse width limited by maximum junction temperature.

Ordering & Marking Information:

Device Name: EMBA1N10Q for SOT-223



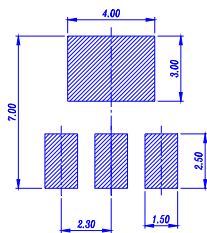
Outline Drawing



Dimension in mm

Dimension	A	C	D	E	I	H	B	J	1	2	3	4	5
Min.	6.70	2.90	0.02	0°	0.60	0.25			6.30	63.0	3.30	3.30	1.40
Typ.							13°	2.30					
Max.	7.30	3.10	0.10	10°	0.80	0.35			6.70	6.70	3.70	3.70	1.80

Recommended minimum pads





TYPICAL CHARACTERISTICS

