

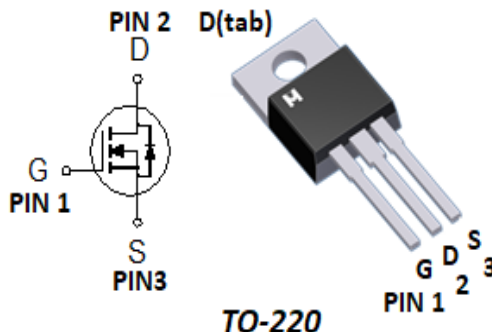
N-Channel Logic Level Enhancement Mode Field Effect Transistor

Product Summary:

BV_{DSS}	100V
$R_{DS(on)} (MAX.)$	12m Ω
I_D	70A

UIS, Rg 100% Tested

RoHS & Halogen Free & TSCA Compliant



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

PARAMETERS/TEST CONDITIONS		SYMBOL	LIMITS	UNIT
Gate-Source Voltage		V_{GS}	± 20	V
Continuous Drain Current	$T_C = 25^\circ\text{C}$	I_D	70	A
	$T_C = 100^\circ\text{C}$		44	
Pulsed Drain Current ¹		I_{DM}	280	
Avalanche Current		I_{AS}	18	
Avalanche Energy	$L = 0.1\text{mH}$, $I_{AS}=18\text{A}$, $R_G=25\Omega$	E_{AS}	16.2	mJ
Repetitive Avalanche Energy ²	$L = 0.05\text{mH}$	E_{AR}	8.1	
Power Dissipation	$T_C = 25^\circ\text{C}$	P_D	104	W
	$T_C = 100^\circ\text{C}$		41	
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	$R_{\theta JC}$		1.2	$^\circ\text{C} / \text{W}$
Junction-to-Ambient	$R_{\theta JA}$		62.5	

¹Pulse width limited by maximum junction temperature.

²Duty cycle $< 1\%$

³The value of $R_{\theta JA}$ is measured with the device mounted on 1in² FR-4 board with 2oz. Copper, in a still air environment with $T_A = 25^\circ\text{C}$.

ELECTRICAL CHARACTERISTICS ($T_J = 25^\circ\text{C}$, 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
		$V_{DS} = 70V, V_{GS} = 0V, T_J = 125\text{ }^{\circ}C$			25	
On-State Drain Current ¹	$I_{D(ON)}$	$V_{DS} = 10V, V_{GS} = 10V$	70			A
Drain-Source On-State Resistance ¹	$R_{DS(ON)}$	$V_{GS} = 10V, I_D = 12A$		10	12	m Ω
		$V_{GS} = 4.5V, I_D = 10A$		12	15	
Forward Transconductance ¹	g_{fs}	$V_{DS} = 5V, I_D = 12A$		45		S
DYNAMIC						
Input Capacitance	C_{iss}	$V_{GS} = 0V, V_{DS} = 50V, f = 1MHz$		2130		pF
Output Capacitance	C_{oss}			336		
Reverse Transfer Capacitance	C_{rss}			29		
Gate Resistance	R_g	$V_{GS} = 15mV, V_{DS} = 0V, f = 1MHz$		1.5		Ω
Total Gate Charge ^{1,2}	$Q_g(V_{GS}=10V)$	$V_{DS} = 50V, V_{GS} = 10V,$ $I_D = 12A$		38		nC
	$Q_g(V_{GS}=4.5V)$			23		
Gate-Source Charge ^{1,2}	Q_{gs}			10		
Gate-Drain Charge ^{1,2}	Q_{gd}			8.2		
Turn-On Delay Time ^{1,2}	$t_{d(on)}$	$V_{DS} = 50V,$ $I_D = 12A, V_{GS} = 10V, R_{GS} = 6\Omega$		6		nS
Rise Time ^{1,2}	t_r			10		
Turn-Off Delay Time ^{1,2}	$t_{d(off)}$			8		
Fall Time ^{1,2}	t_f			25		
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (T _C = 25 °C)						
Continuous Current	I_S				70	A
Pulsed Current ³	I_{SM}				280	
Forward Voltage ¹	V_{SD}	$I_F = 12A, V_{GS} = 0V$			1.2	V
Reverse Recovery Time	t_{rr}	$I_F = 12A, dI_F/dt = 100A / \mu S$		30		nS
Reverse Recovery Charge	Q_{rr}			130		nC

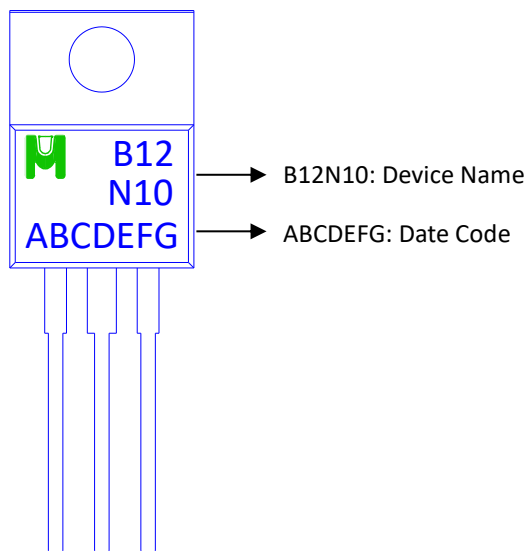
¹Pulse test : Pulse Width $\leq 300\mu\text{sec}$, Duty Cycle $\leq 2\%$.

²Independent of operating temperature.

³Pulse width limited by maximum junction temperature.

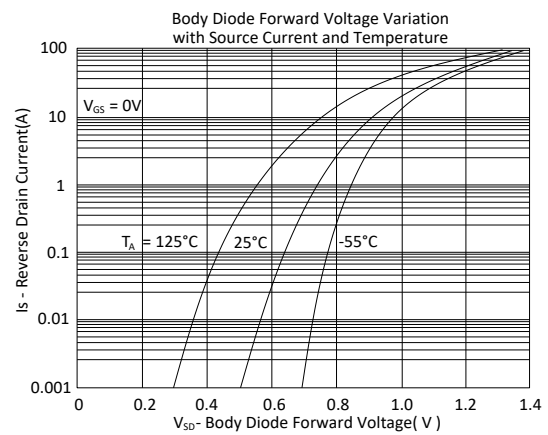
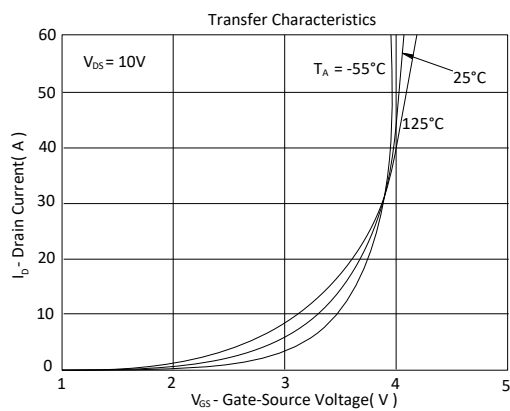
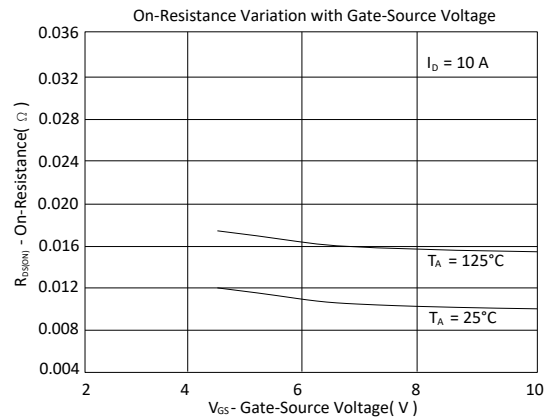
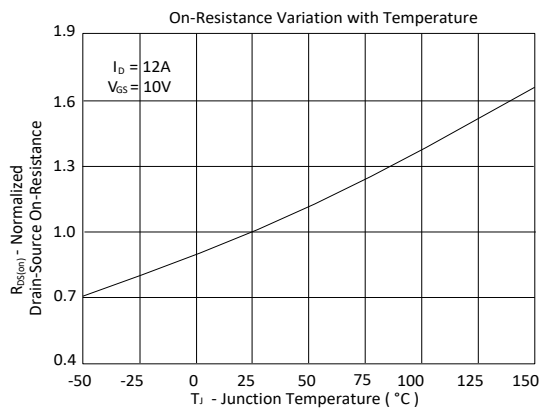
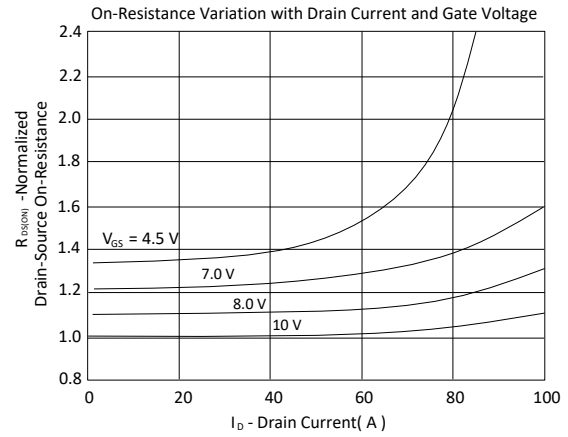
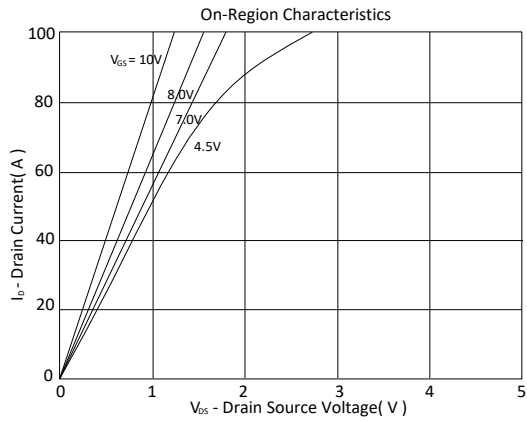
Ordering & Marking Information:

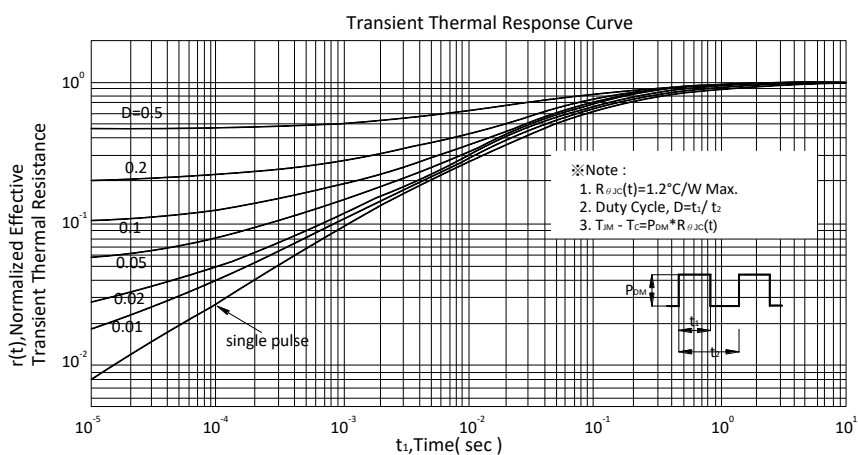
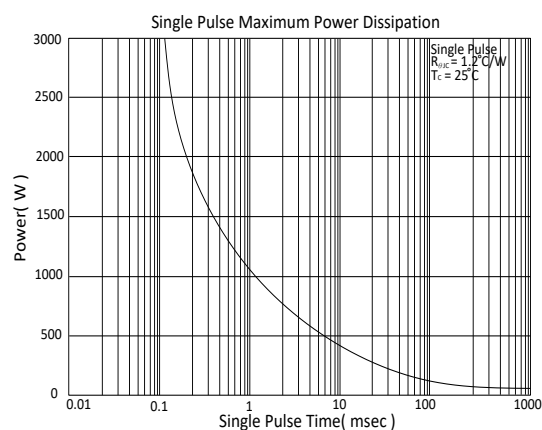
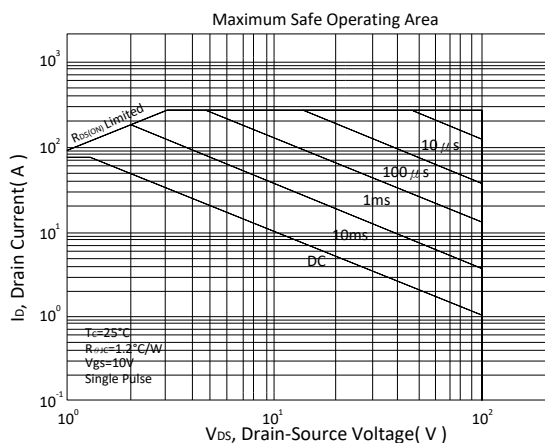
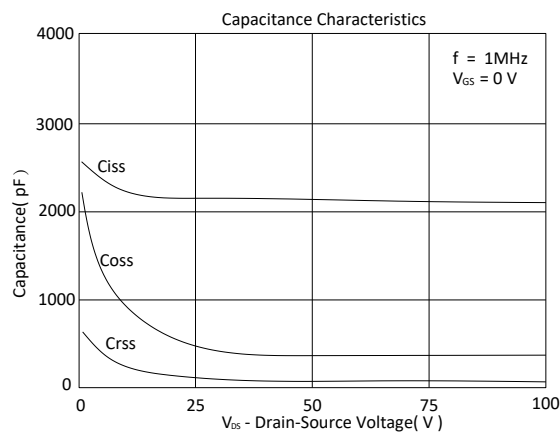
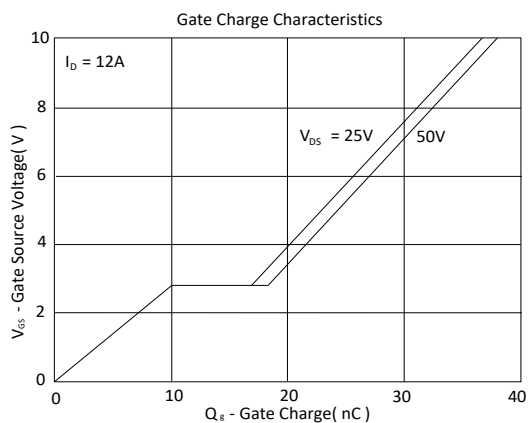
Device Name: EMB12N10E for TO-220



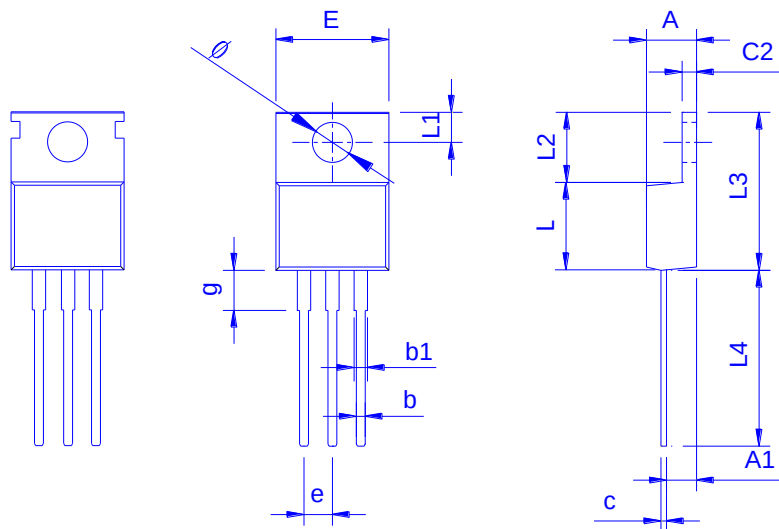


TYPICAL CHARACTERISTICS





Outline Drawing



Dimension in mm

Dimension	A	A1	b	b1	c	c2	E	L	L1	L2	L3	L4	Ø	e	g
Min.	4.240	2.250	0.700	1.170	0.310	1.150	9.910	8.500	2.590	6.100	14.700	12.700	3.400	2.440	2.850
Typ.	4.440	2.400	0.800	1.550	0.500	1.270	10.160	8.920	2.800	6.300	15.370	13.720	3.840	2.540	3.800
Max.	4.700	2.820	0.910	1.750	0.650	1.400	10.360	9.750	3.250	6.800	16.900	13.970	3.935	2.640	4.000



◆ Tube Information: 50pcs/Tube (1000pcs/Box)

