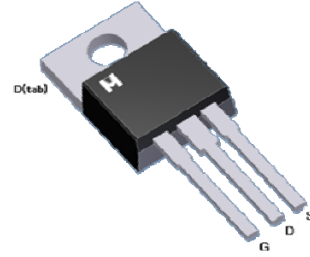
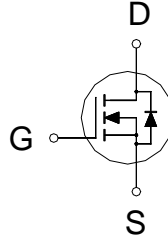


N-Channel Logic Level Enhancement Mode Field Effect Transistor

Product Summary:

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



UIS, Rg 100% Tested

Pb-Free Lead Plating & Halogen Free



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

PARAMETERS/TEST CONDITIONS		SYMBOL	LIMITS	UNIT
Gate-Source Voltage		$V_{GS}$	$\pm 20$	V
Continuous Drain Current	$T_C = 25\text{ }^\circ\text{C}$	$I_D$	70	A
	$T_C = 100\text{ }^\circ\text{C}$		44	
Pulsed Drain Current <sup>1</sup>		$I_{DM}$	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 <sup>2</sup>	$L = 0.05\text{mH}$	$E_{AR}$	8.1	
Power Dissipation	$T_C = 25\text{ }^\circ\text{C}$	$P_D$	104	W
	$T_C = 100\text{ }^\circ\text{C}$		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	

<sup>1</sup>Pulse width limited by maximum junction temperature.

<sup>2</sup>Duty cycle  $\leq 1\%$



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

PARAMETER	SYMBOL	TEST CONDITIONS	LIMITS			UNIT		
			MIN	TYP	MAX			
<b>STATIC</b>								
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	$I_{GSS}$	$V_{DS} = 0V, V_{GS} = \pm 12V$			$\pm 100$	nA		
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = 80V, V_{GS} = 0V$			1	$\mu A$		
		$V_{DS} = 70V, V_{GS} = 0V, T_J = 125\text{ }^\circ\text{C}$			25			
On-State Drain Current <sup>1</sup>	$I_{D(ON)}$	$V_{DS} = 10V, V_{GS} = 10V$	70			A		
Drain-Source On-State Resistance <sup>1</sup>	$R_{DS(ON)}$	$V_{GS} = 10V, I_D = 12A$		10	12	$m\Omega$		
		$V_{GS} = 4.5V, I_D = 10A$		12	15			
Forward Transconductance <sup>1</sup>	$g_{fs}$	$V_{DS} = 5V, I_D = 12A$		45		S		
<b>DYNAMIC</b>								
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		$\Omega$		
Total Gate Charge <sup>1,2</sup>	$Q_g(V_{GS}=10V)$	$V_{DS} = 50V, V_{GS} = 10V,$ $I_D = 12A$		38		nC		
	$Q_g(V_{GS}=4.5V)$			23				
Gate-Source Charge <sup>1,2</sup>	$Q_{gs}$			10				
Gate-Drain Charge <sup>1,2</sup>	$Q_{gd}$			8.2				
Turn-On Delay Time <sup>1,2</sup>	$t_{d(on)}$		$V_{DS} = 50V,$ $I_D = 12A, V_{GS} = 10V, R_{GS} = 6\Omega$		6			nS
Rise Time <sup>1,2</sup>	$t_r$				10			
Turn-Off Delay Time <sup>1,2</sup>	$t_{d(off)}$			8				
Fall Time <sup>1,2</sup>	$t_f$			25				
<b>SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (<math>T_C = 25\text{ }^\circ\text{C}</math>)</b>								
Continuous Current	$I_S$				70	A		
Pulsed Current <sup>3</sup>	$I_{SM}$				280			
Forward Voltage <sup>1</sup>	$V_{SD}$	$I_F = 12A, V_{GS} = 0V$			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		

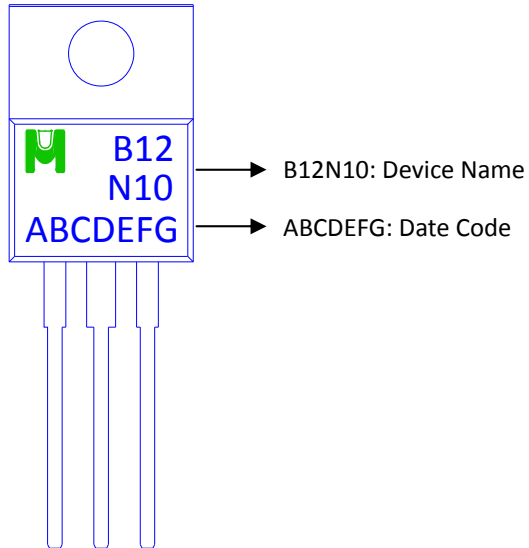
<sup>1</sup>Pulse test : Pulse Width  $\leq 300\text{ }\mu\text{sec}$ , Duty Cycle  $\leq 2\%$ .

<sup>2</sup>Independent of operating temperature.

<sup>3</sup>Pulse width limited by maximum junction temperature.

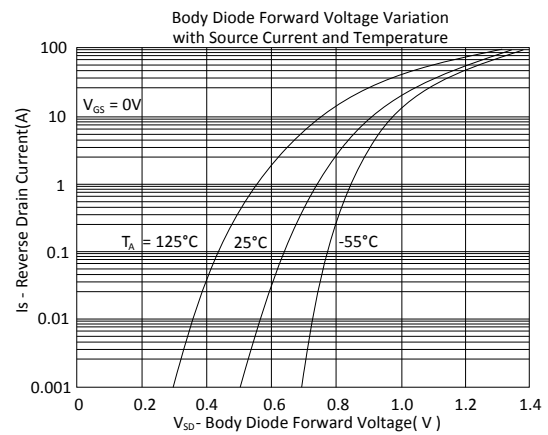
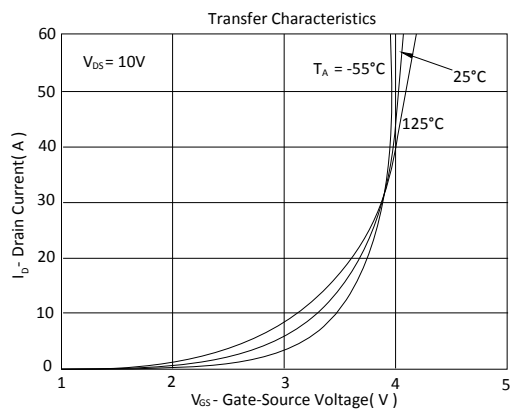
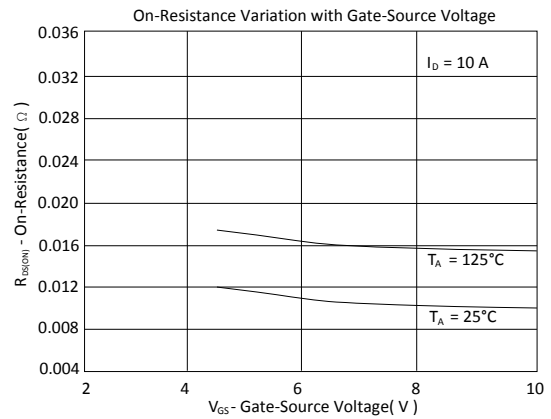
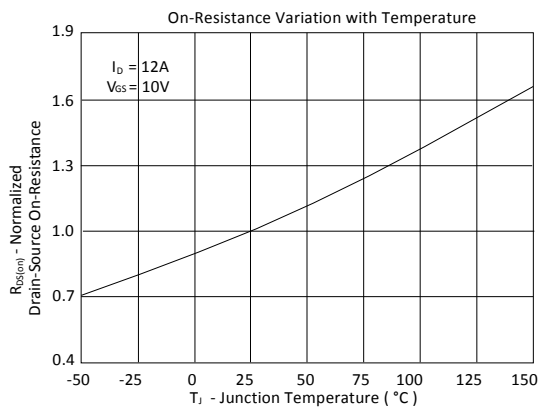
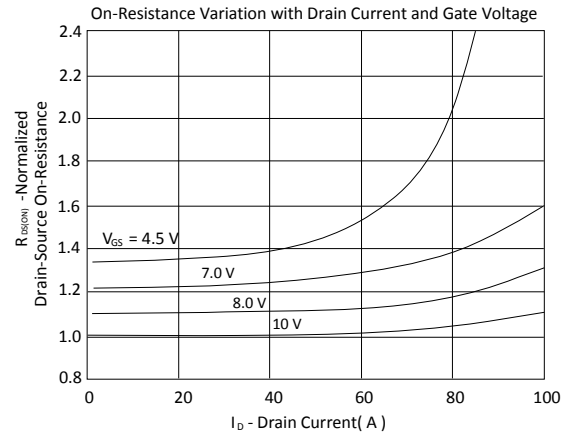
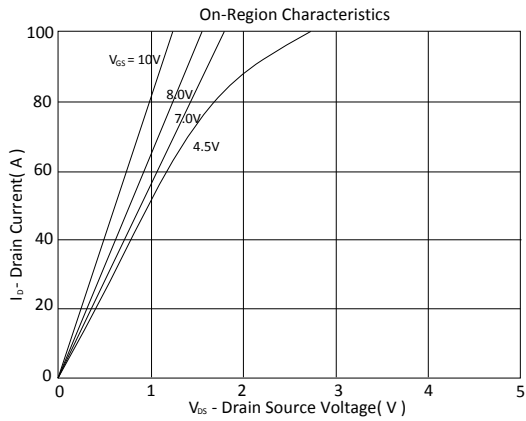
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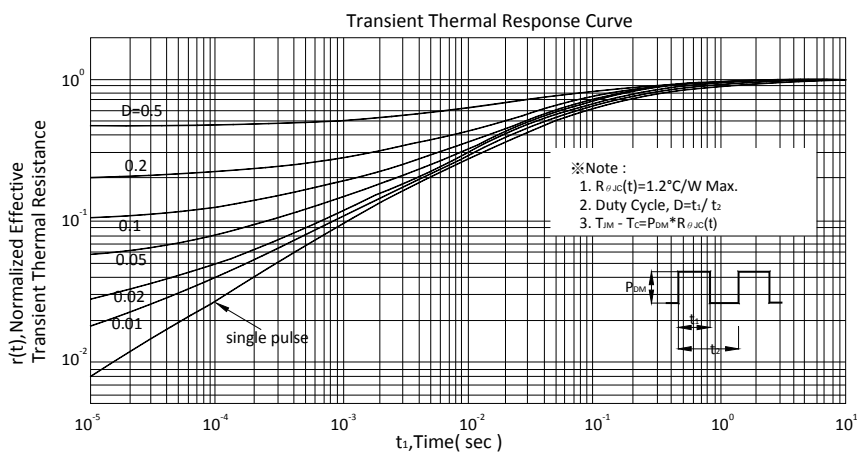
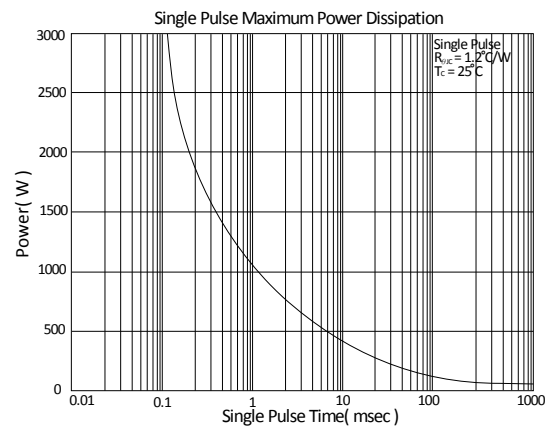
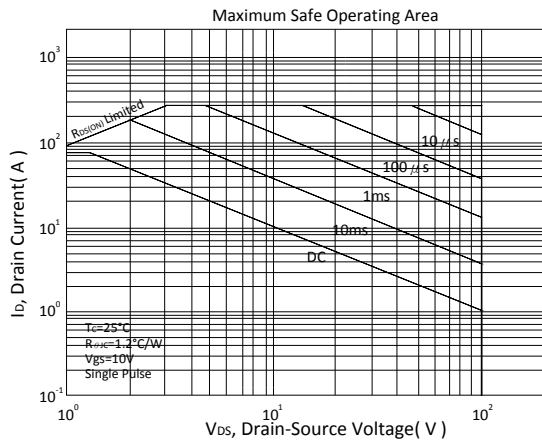
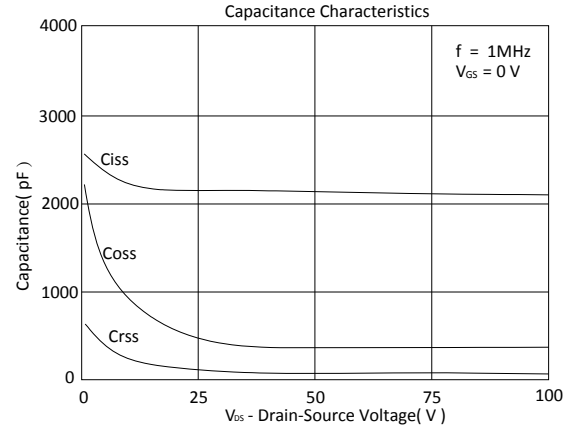
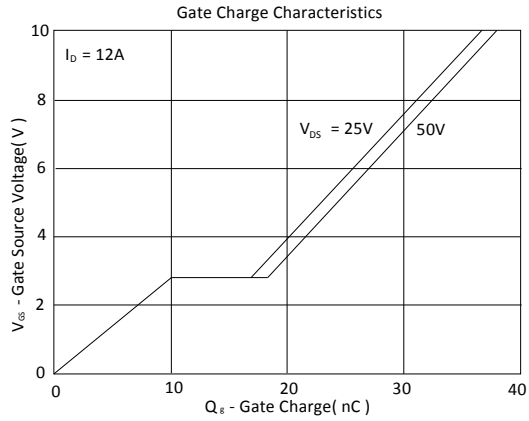
Device Name: EMB12N10E for TO-220





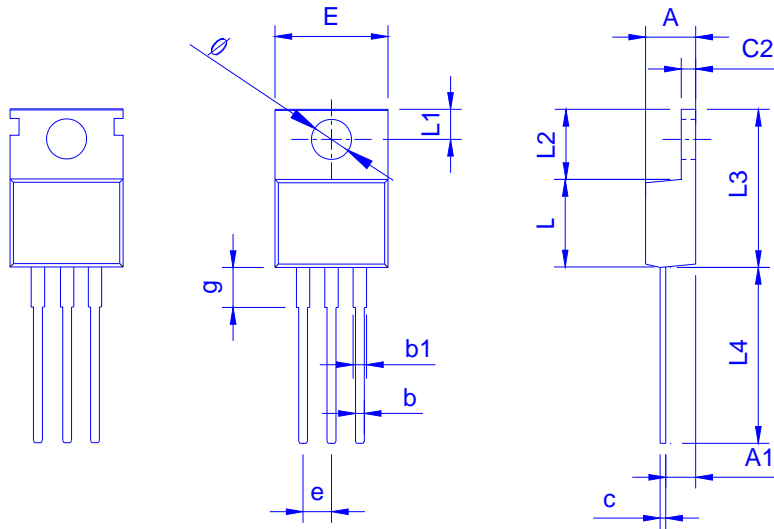
TYPICAL CHARACTERISTICS







Outline Drawing



Dimension in mm

Dimension	A	A1	b	b1	c	c2	E	L	L1	L2	L3	L4	∅	e	g
Min.	4.07	2.04	0.60	1.15	0.31	1.11	9.90	8.30	2.50	6.00	14.30	12.70	3.40	2.04	2.85
Typ.	4.44	2.40	0.80	1.27	-	1.27	10.16	-	2.74	6.30	15.00	13.40	3.84	2.54	3.71
Max.	4.82	3.00	1.00	1.75	0.65	1.41	11.50	9.75	3.25	6.80	16.90	14.50	4.00	3.04	4.10