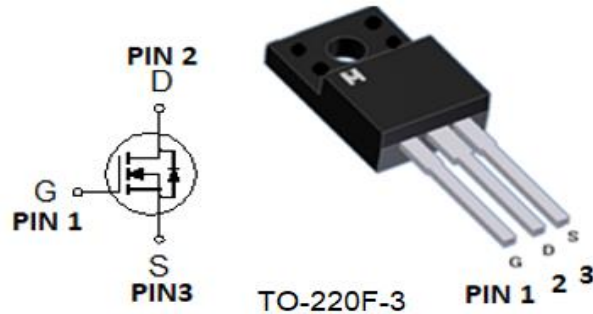


Single N-Channel Logic Level Enhancement Mode Field Effect Transistor

▪Product Summary:

	N-CH
BV_{DSS}	60V
$R_{DS(on)} (MAX.) @ V_{GS}=10V$	5.5mΩ
$R_{DS(on)} (MAX.) @ V_{GS}=4.5V$	8.5mΩ
$I_D @ T_C=25^{\circ}C$	72A

▪ Pin Description:



Single N Channel MOSFET

UIS, Rg 100% Tested

RoHS Compliant & Halogen Free & TSCA Compliant

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



PARAMETERS/TEST CONDITIONS		SYMBOL	LIMITS	UNIT
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current	$T_C = 25^{\circ}C$	I_D	72	A
	$T_C = 100^{\circ}C$		45	
Pulsed Drain Current ¹ @ $T_C=25^{\circ}C$		I_{DM}	256	
Avalanche Current		I_{AS}	30	mJ
Avalanche Energy	$L = 0.1mH$	EAS	61	
Repetitive Avalanche Energy ²	$L = 0.05mH$	EAR	31	
Power Dissipation	$T_C = 25^{\circ}C$	P_D	46	W
	$T_C = 100^{\circ}C$		18.5	
Power Dissipation	$T_A = 25^{\circ}C$	P_D	2.1	W
	$T_A = 70^{\circ}C$		1.3	
Operating Junction & Storage Temperature Range		T_j, T_{stg}	-55 to 150	$^{\circ}C$

▪ 100% UIS testing in condition of $V_D=30V$, $L=0.1mH$, $V_G=10V$, $I_L=18A$, Rated $V_{DS}=60V$ N-CH

▪THERMAL RESISTANCE RATINGS

THERMAL RESISTANCE	SYMBOL	TYPICAL	MAXIMUM	UNIT
Junction-to-Case	$R_{\theta JC}$		2.7	$^{\circ}C/W$
Junction-to-Ambient ³	$R_{\theta JA}$		60	

¹Pulse width limited by maximum junction temperature.

²Duty cycle < 1%

³60 $^{\circ}C$ / W when mounted on a 1 in² pad of 2 oz copper.

⁴Guarantee by Engineering test

▪ 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 ⁴	V _{(BR)DSS}	V _{GS} = 0V, I _D = 250μA	60			V
Gate Threshold Voltage ⁴	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250μA	1.2	1.7	2.5	
Gate-Body Leakage ⁴	I _{GSS}	V _{DS} = 0V, V _{GS} = ±20V			±100	nA
Zero Gate Voltage Drain Current ⁴	I _{DSS}	V _{DS} = 48V, V _{GS} = 0V			1	μA
		V _{DS} =40V, V _{GS} =0V, T _J = 125 °C			25	
On-State Drain Current ¹	I _{D(ON)}	V _{DS} = 10V, V _{GS} = 10V	72			A
Drain-Source On-State Resistance ^{1,4}	R _{DS(ON)}	V _{GS} = 10V, I _D =15A		4.6	5.5	mΩ
		V _{GS} = 4.5V, I _D = 10A		6.4	8.5	
DYNAMIC						
Input Capacitance ⁵	C _{iss}	V _{GS} = 0V, V _{DS} = 30V, f = 1MHz		2220		pF
Output Capacitance ⁵	C _{oss}			849		
Reverse Transfer Capacitance ⁵	C _{rss}			75		
Gate Resistance ^{4,5}	R _g	f = 1MHz		0.8		Ω
Total Gate Charge ^{1,2,5}	Q _g (V _{GS} =10V)	V _{DS} = 30V, V _{GS} = 10V, I _D = 15A		48		nC
Gate-Source Charge ^{1,2,5}	Q _{gs}			8.1		
Gate-Drain Charge ^{1,2,5}	Q _{gd}			13		
Turn-On Delay Time ^{1,2,5}	t _{d(on)}	V _{DS} = 30V, V _{GS} = 10V, I _D = 5A , R _g = 3Ω		9.4		nS
Rise Time ^{1,2,5}	t _r			10		
Turn-Off Delay Time ^{1,2,5}	t _{d(off)}			26		
Fall Time ^{1,2,5}	t _f			17		
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS						
Continuous Current	I _S				72	A
Pulsed Current ³	I _{SM}				256	
Forward Voltage ^{1,4}	V _{SD}	I _F = I _S =30A, V _{GS} = 0V			1.3	V
Reverse Recovery Time ⁵	t _{rr}	I _F = 30A, dI _F /dt = 100A / μS		25		nS
Reverse Recovery Charge ⁵	Q _{rr}			9.8		nC

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

² Independent of operating temperature.

³ Pulse width limited by maximum junction temperature.

⁴ Guarantee by FT test item

⁵ Guarantee by Engineering test

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



■ TYPICAL CHARACTERISTICS

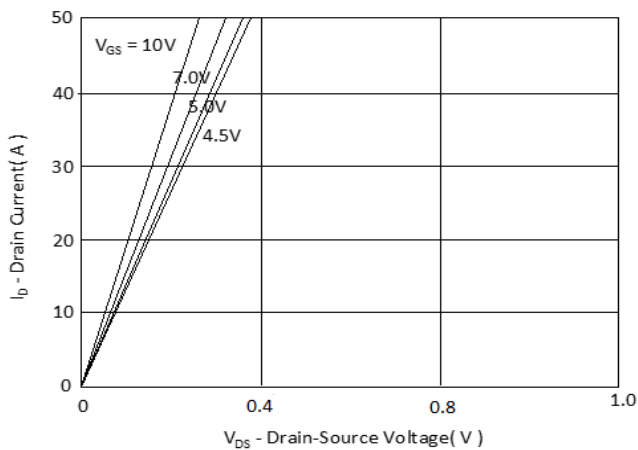


Fig.1 Typical Output Characteristics

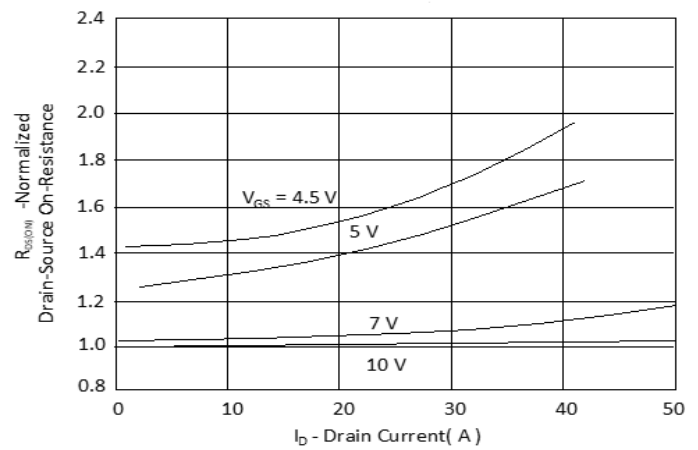


Fig.2 On-Resistance Variation with Drain Current and Gate Voltage

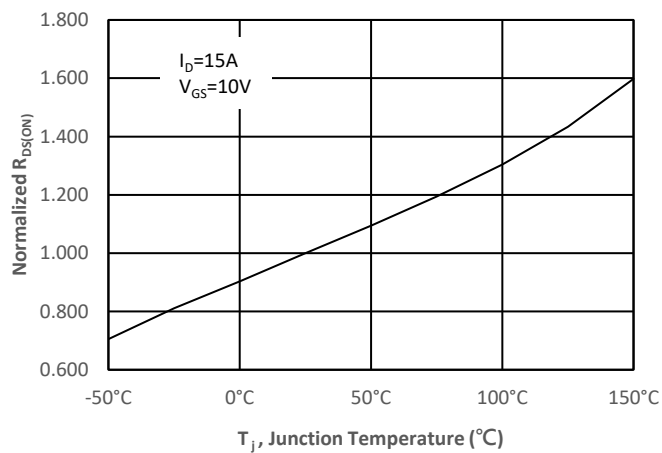


Fig.3 Normalized On-Resistance v.s. Junction Temperature

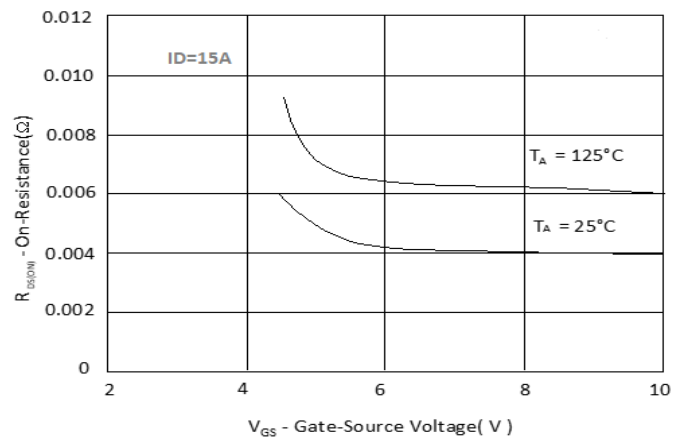


Fig.4 On-Resistance v.s. Gate Voltage

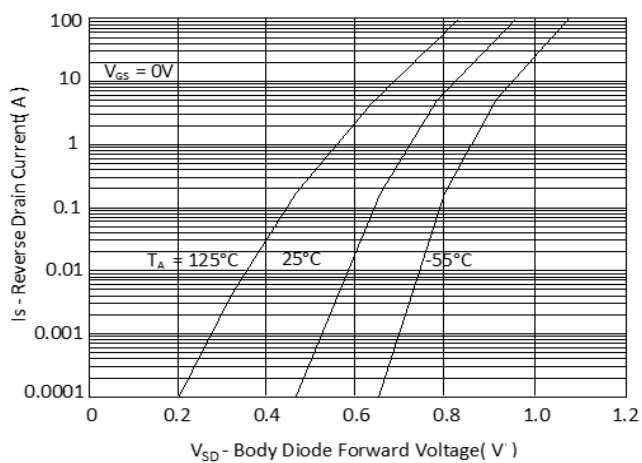


Fig.5 Forward Characteristic of Reverse Diode

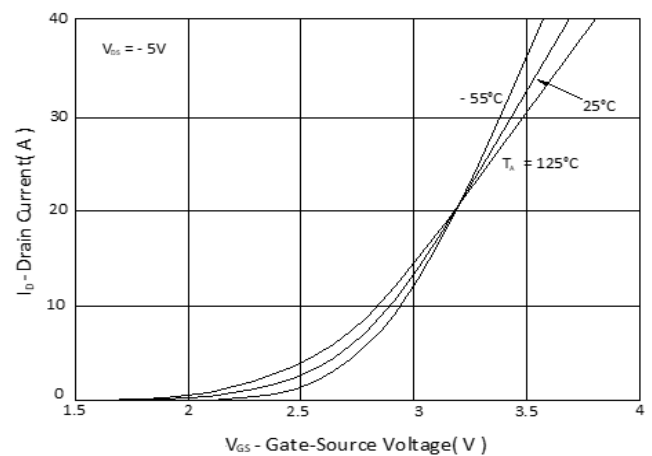


Fig.6 Transfer Characteristics

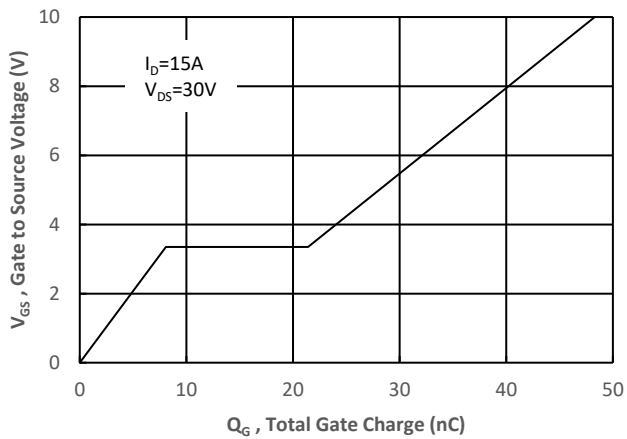


Fig.7 Gate Charge Characteristics

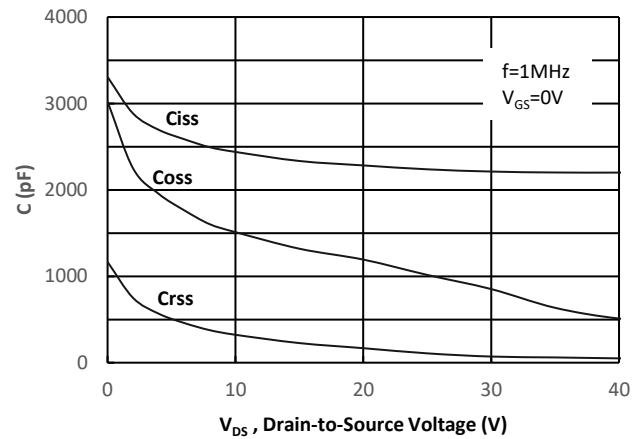


Fig.8 Typical Capacitance Characteristics

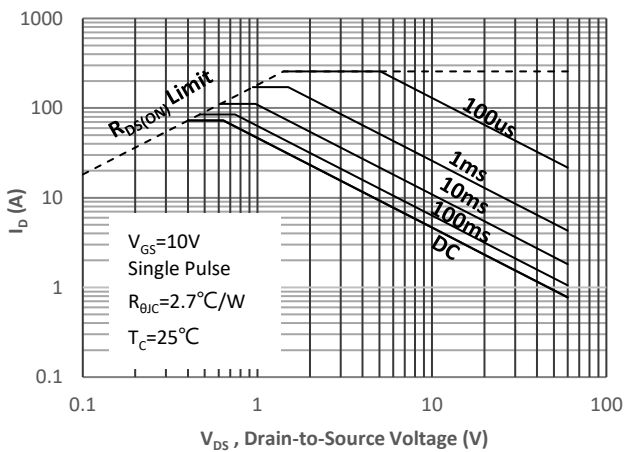


Fig 9. Maximum Safe Operating Area

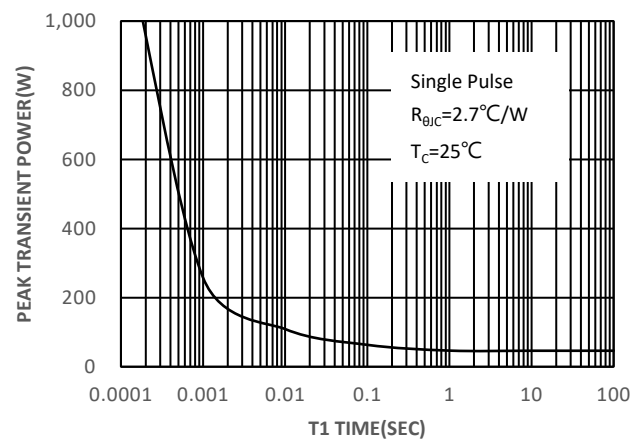


Fig 10. Single Pulse Maximum Power Dissipation

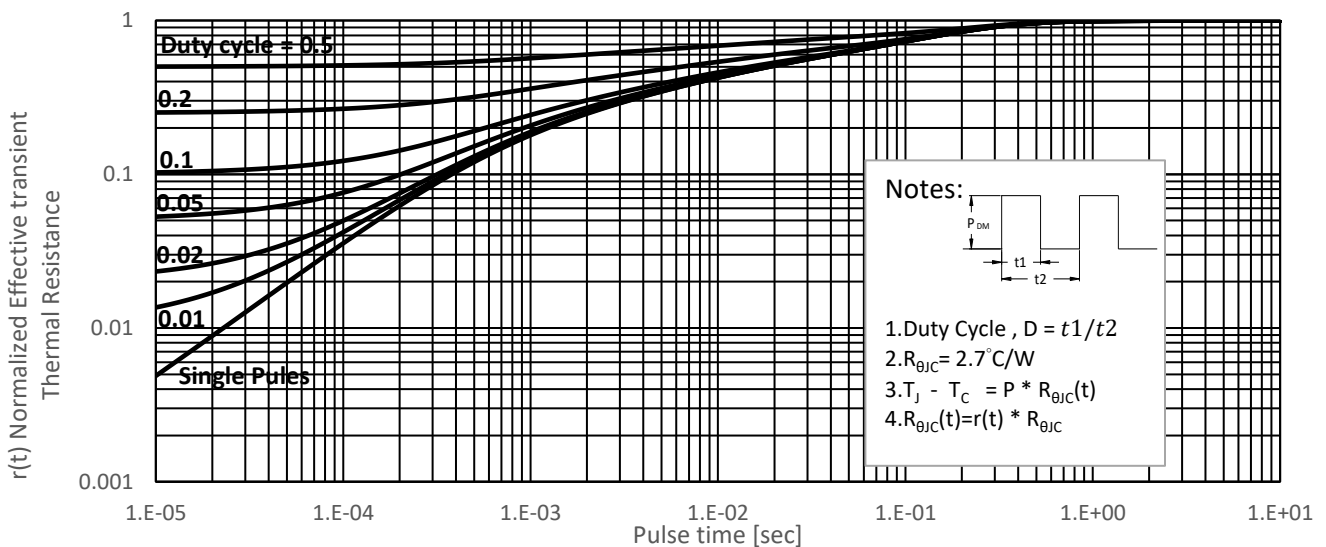
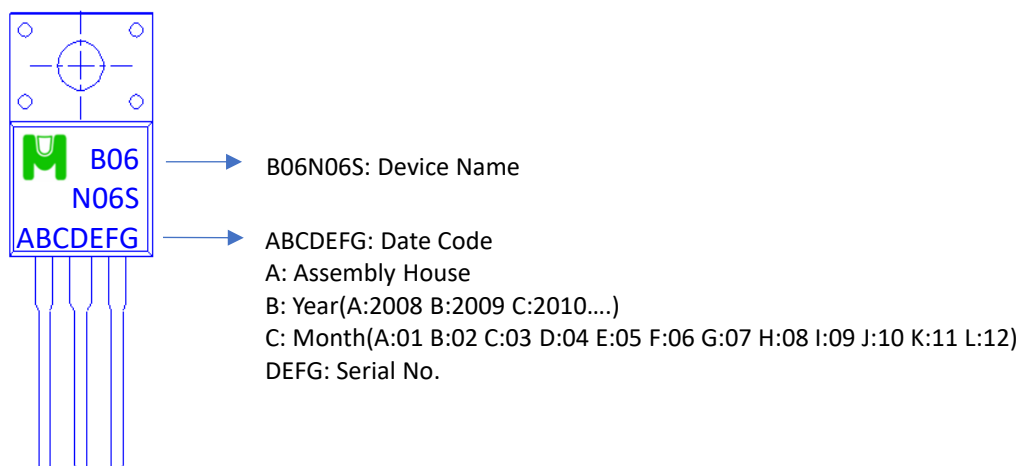


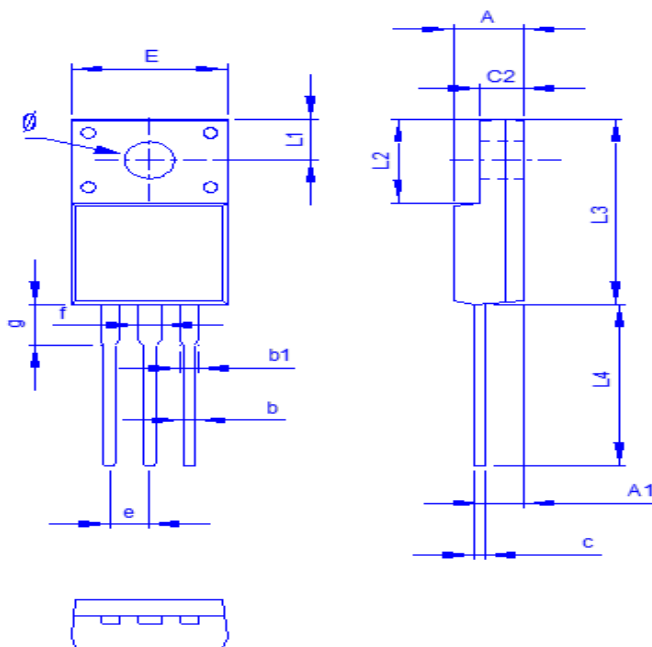
Fig 11. Effective Transient Thermal Impedance

Ordering & Marking Information:

Device Name: EMB06N06FS for TO220F-3



Outline Drawing



Dimension	A	A1	b	b1	c	c2	E	L1	L2	L3	L4	ø	e	f	g
Min.	4.3	2.49	0.5	1.1	0.4	2.34	9.96	2.7	6.48	14.8	12.65	3	2.44	1.17	2.93
Typ.	4.5	2.59	0.8	1.3	0.5	2.54	10.1	3.25	6.68	15.87	12.98	3.1	2.54	1.28	3.03
Max.	4.9	2.96	0.95	1.6	0.75	3.2	10.36	3.45	6.9	16.2	13.5	3.38	2.64	1.75	4

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

