

N-Channel Logic Level Enhancement Mode Field Effect Transistor

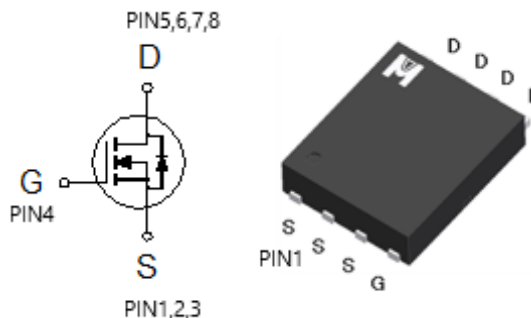
Product Summary:

BV_{DSS}	30V
$R_{DS(on)} (MAX.) @ V_{GS}=10V$	$7.8m\Omega$
$I_D @ T_C=25^\circ C$	50A

Single N Channel MOSFET

UIS, Rg 100% Tested

RoHS & 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	50	A
	$T_C = 100^\circ C$		40	
	$T_A = 25^\circ C$		14	
	$T_A = 70^\circ C$		11	
Pulsed Drain Current ¹		I_{DM}	100	mJ
Avalanche Current		I_{AS}	35	
Avalanche Energy	$L = 0.1mH$	E_{AS}	60	
Repetitive Avalanche Energy ²	$L = 0.05mH$	E_{AR}	30	W
Power Dissipation	$T_C = 25^\circ C$	P_D	50	
	$T_C = 100^\circ C$		20	
Operating Junction & Storage Temperature Range		T_j, T_{stg}	-55 to 150	$^\circ C$

100% UIS testing in condition of $V_D=25V$, $L=0.1mH$, $V_G=10V$, $I_L=21A$, Rated $V_{DS}=30V$ N-CH

THERMAL RESISTANCE RATINGS

THERMAL RESISTANCE	SYMBOL	TYPICAL	MAXIMUM	UNIT
Junction-to-Case	$R_{\theta JC}$		2.5	$^\circ C / W$
Junction-to-Ambient ³	$R_{\theta JA}$		50	



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 $T_A = 25^\circ\text{C}$.

⁴Guarantee by Engineering test

ELECTRICAL CHARACTERISTICS ($T_J = 25\text{ }^{\circ}\text{C}$, 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 = 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			25	
On-State Drain Current ¹	I _{D(ON)}	V _{DS} = 10V, V _{GS} = 10V	50			A
Drain-Source On-State Resistance ¹	R _{DS(ON)}	V _{GS} = 10V, I _D = 25A		5.8	7.8	mΩ
		V _{GS} = 4.5V, I _D = 20A		8.5	10.5	
Forward Transconductance ¹	g _{fs}	V _{DS} = 5V, I _D = 20A		18		S
DYNAMIC						
Input Capacitance	C _{iss}	V _{GS} = 0V, V _{DS} = 15V, f = 1MHz		967		pF
Output Capacitance	C _{oss}			168		
Reverse Transfer Capacitance	C _{rss}			95		
Gate Resistance	R _g	V _{GS} = 15mV, V _{DS} = 0V, f = 1MHz		1.0		Ω
Total Gate Charge ^{1,2}	Q _g (V _{GS} =10V)	V _{DS} = 15V, V _{GS} = 10V, I _D = 25A		17		nC
	Q _g (V _{GS} =4.5V)			8.6		
Gate-Source Charge ^{1,2}	Q _{gs}			2.7		
Gate-Drain Charge ^{1,2}	Q _{gd}			3.9		
Turn-On Delay Time ^{1,2}	t _{d(on)}	V _{DS} = 15V, I _D = 5A, V _{GS} = 10V, R _G = 3Ω		6		nS
Rise Time ^{1,2}	t _r			7.5		
Turn-Off Delay Time ^{1,2}	t _{d(off)}			16.6		
Fall Time ^{1,2}	t _f			5		
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (T _c = 25 °C)						
Continuous Current	I _S				50	A
Pulsed Current ³	I _{SM}				100	
Forward Voltage ¹	V _{SD}	I _F = I _S , V _{GS} = 0V			1.3	V
Reverse Recovery Time	t _{rr}	IF = 25A, dIF/dt = 100A / us		20		nS
Peak Reverse Recovery Current	I _{RM(REC)}			180		A
Reverse Recovery Charge	Q _{rr}			11		nC



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Excelliance MOS Corporation

EMB07N03HQ

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

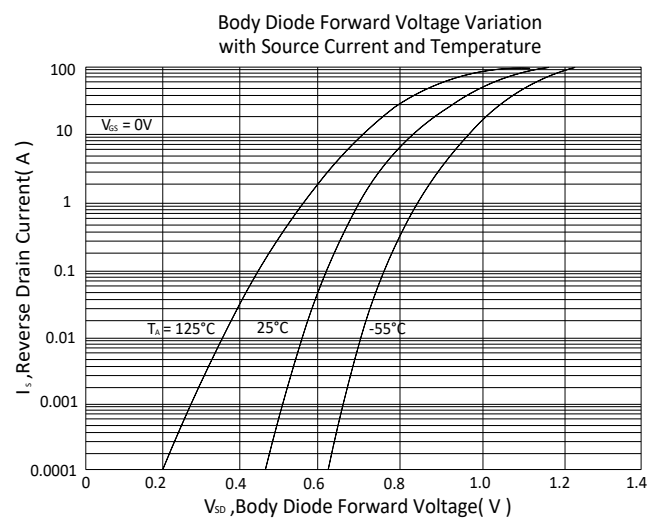
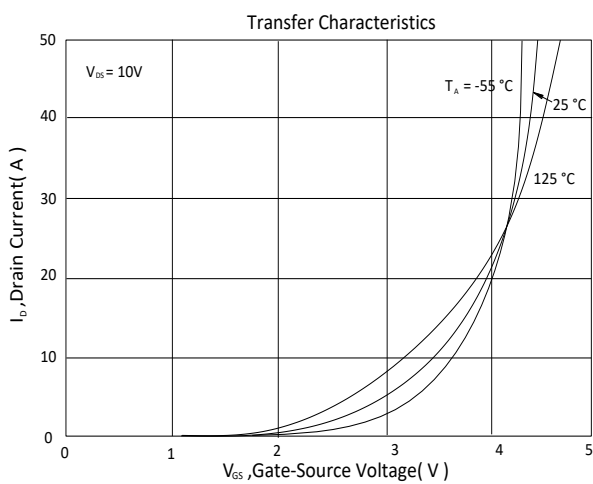
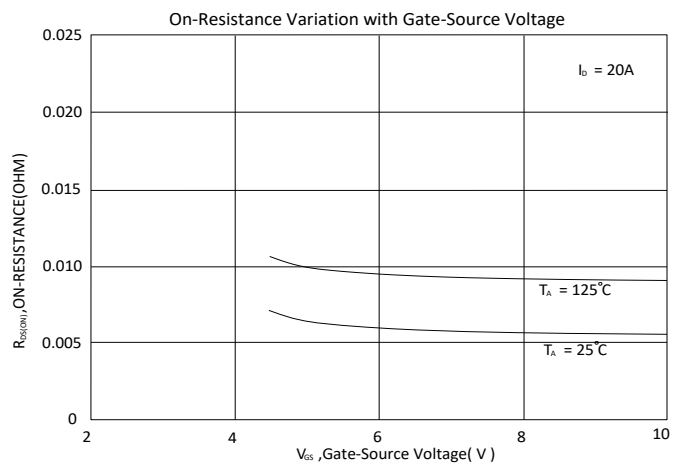
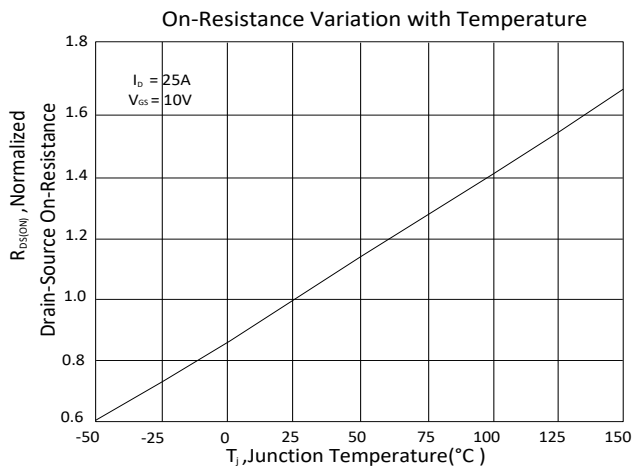
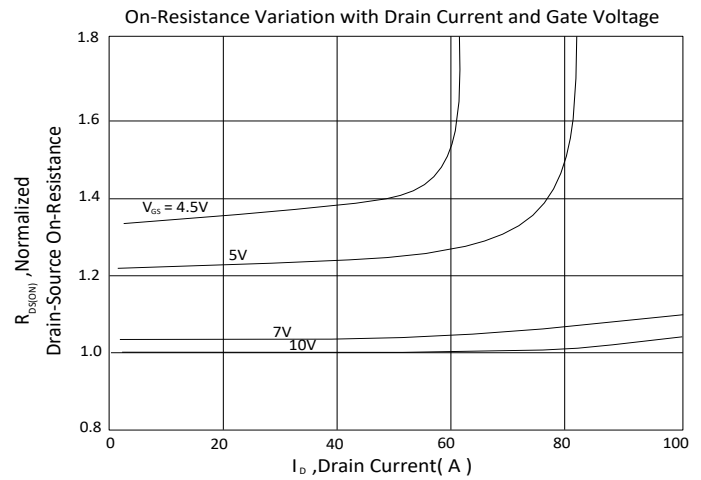
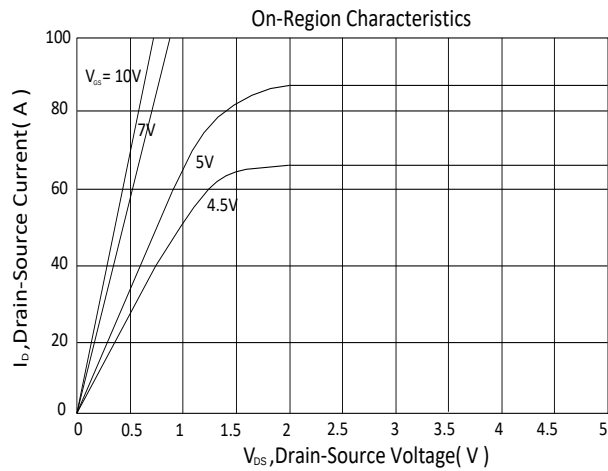
²Independent of operating temperature.

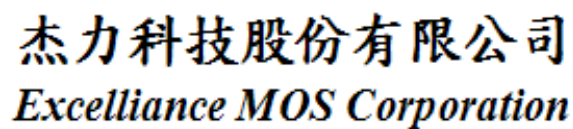
³Pulse width limited by maximum junction temperature.

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



TYPICAL CHARACTERISTICS





Gate Charge Characteristics

$I_D = 25A$

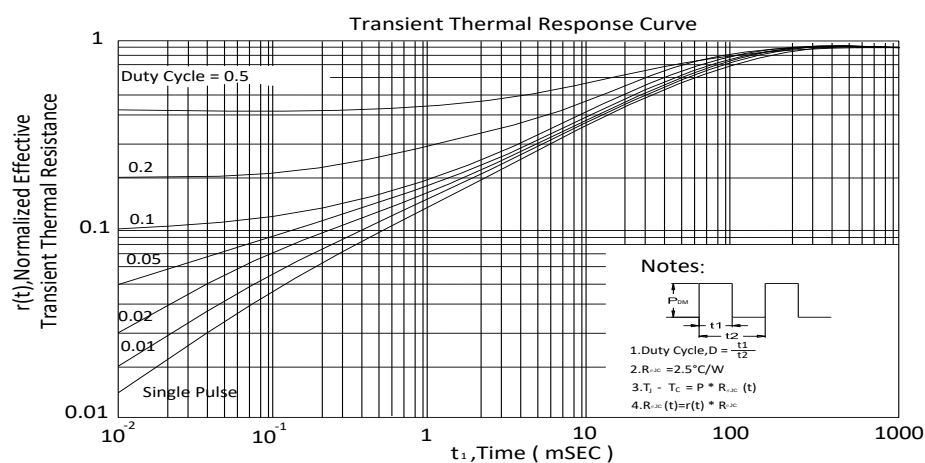
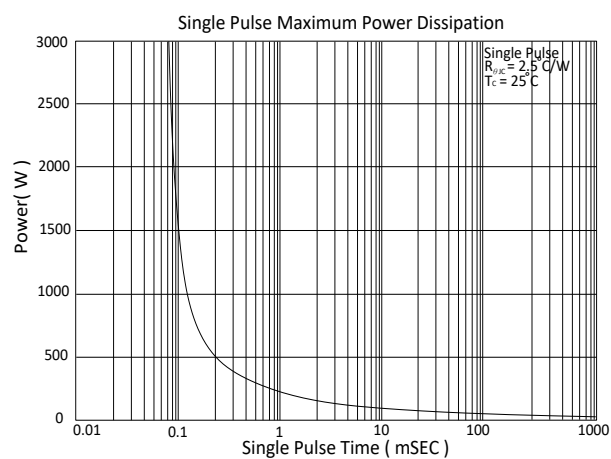
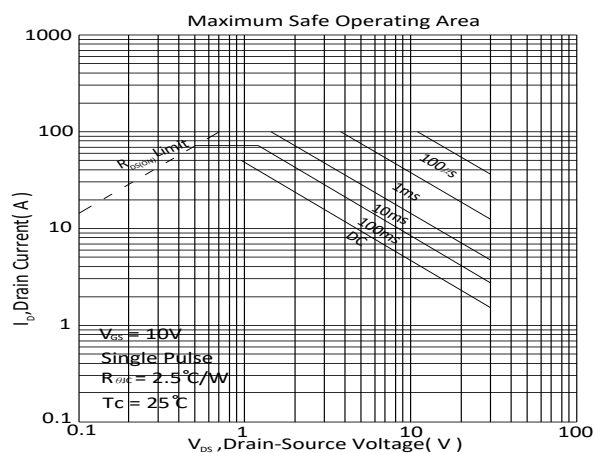
$V_{DS} = 5V$

$10V$

$15V$

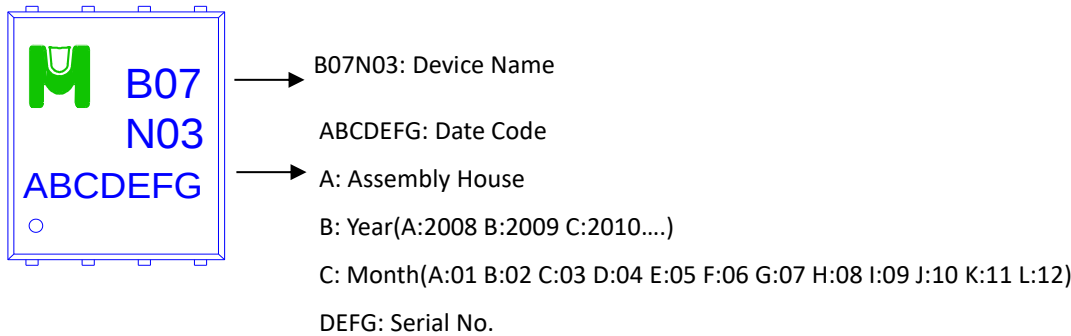
V_{GS} Gate-Source Voltage (V)

Q_g , Gate Charge (nC)

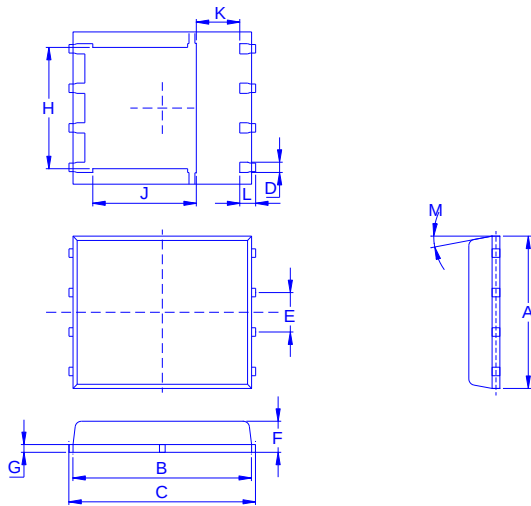


Ordering & Marking Information:

Device Name: EMB07N03HQ for EDFN5X6



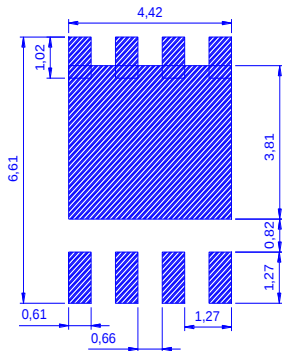
Outline Drawing



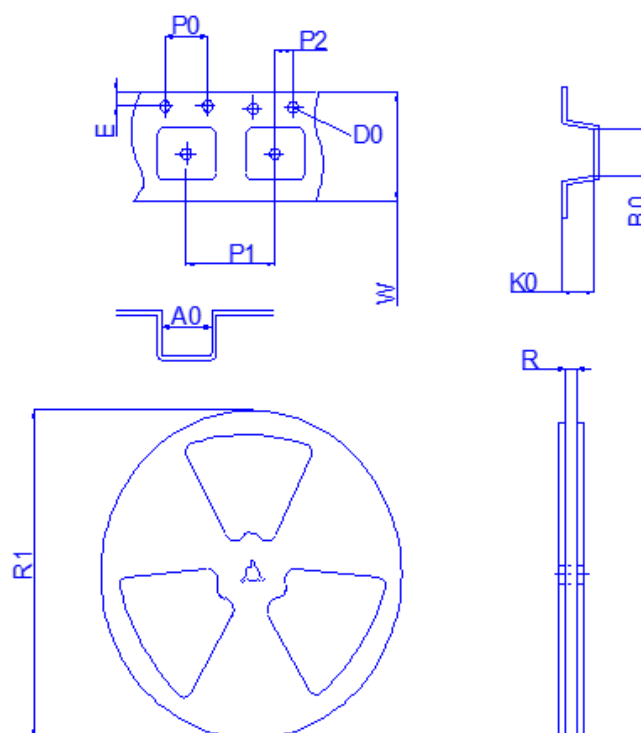
Dimension in mm

Dimension	A	B	C	D	E	F	G	H	J	K	L	M
Min	4.8	5.55	5.9	0.3	1.17	0.85	0.15	3.61	3.18	1	0.38	0°
Typ.	4.9	5.7	6	0.4	1.27	0.95	0.2	3.87	3.44	1.2	0.4	
Max	5.4	5.85	6.15	0.51	1.37	1.17	0.34	4.31	3.78	1.39	0.71	12°

Recommended minimum pads



◆ Tape&Reel Information:2500pcs/Reel(Dimension in millimeter)



Package	EDFN5X6
Reel	13"
Device orientation	FEED DIRECTION

Dimension in mm

Dimension	Carrier tape									Reel	
	A0	B0	D0	E	K0	P0	P1	P2	W	R	R1
Typ.	6.4	5.3	1.5	1.8	1.6	4	8	2	12	12.4	330
±	0.2	0.2	0.1	0.1	0.6	0.1	0.1	0.1	0.3	2	2