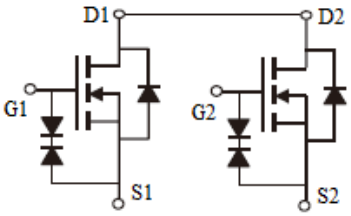
Dual N-Channel High Density Trench MOSFET (20V, 7A)

PRODUCT SUMMARY		
V_{DSS}	I_D	$R_{DS(on)}$ (mΩ) Max
20V	7A	20 @ V_{GS} = 4.5V, I_D=7A
		21 @ V_{GS} = 4.0V, I_D=7A
		28 @ V_{GS} = 2.5V, I_D=5.5A

Features

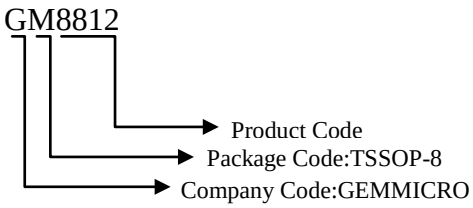
- Super high dense cell trench design for low $R_{DS(on)}$
- Rugged and reliable
- Battery Switch ESD Protected HBM Class-2
- Surface Mount package
- Ordering information:GM8812E (Lead(Pb)-free and halogen-free)

RoHS+HF



Packages:TSSOP-8

Pin 1/ 8: Drain
Pin 2/ 3: Source 1
Pin 4: Gate 1
Pin 5: Gate 2
Pin 6/ 7: Source 2



XXXXXX−Lot Code

Absolute Maximum Ratings (T_A=25℃, unless otherwise noted)

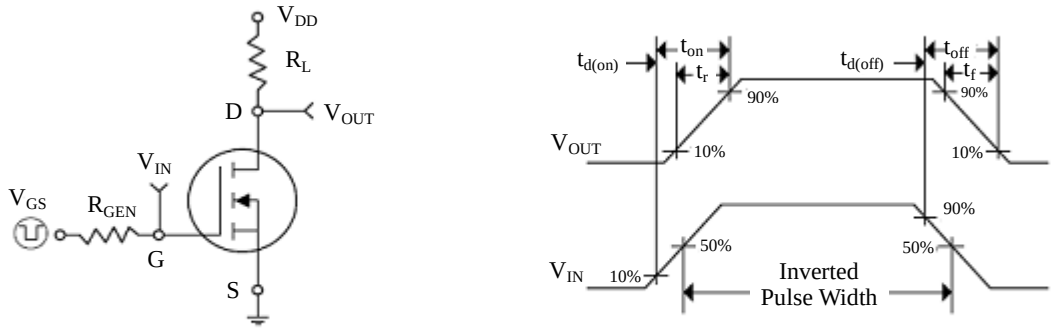
Symbol	Parameter	Ratings	Units
V_{DS}	Drain-Source Voltage	20	V
V_{GS}	Gate-Source Voltage	±12	V
I_D	Drain Current (Continuous)	7	A
I_{DM}	Drain Current (Pulsed) [a]	30	A
P_D	Total Power Dissipation @T_A=25℃	1.5	W
	Total Power Dissipation @T_A=75℃	1.08	
I_S	Maximum Diode Forward Current	1.5	A
T_{stg}	Storage Temperature Range	-55 to +150	℃
T_j	Junction Temperature	150	℃
$R_{\theta JA}$	Thermal Resistance Junction to Ambient (PCB mounted) [b]	83	℃/W

Note: a: Repetitive Rating: Pulse width limited by the maximum junction temperature
b: 1-in^2 2oz Cu PCB board

Electrical Characteristics (T_A=25℃, unless otherwise noted)

Symbol	Characteristic	Test Conditions	Min.	Typ.	Max.	Unit
• Off Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=250μA	20	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=16V, V_{GS}=0V	-	-	1	μA
I_{GSS}	Gate-Body Leakage Current	V_{GS}=±10V, V_{DS}=0V	-	-	±10	μA
• On Characteristics[c]						
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=250μA	0.5	0.7	0.9	V
$R_{DS(on)}$	Drain-Source On-State Resistance	V_{GS}=4.5V, I_D=7A	12	16	20	mΩ
		V_{GS}=4.0V, I_D=7A	13	17	21	
		V_{GS}=2.5V, I_D=5.5A	15	20	28	
G_{FS}	Forward Transconductance		-	20	-	S
• Dynamic Characteristics[d]						
C_{iss}	Input Capacitance	V_{DS} = 10V, V_{GS} = 0V,f = 1.0 MHz	-	860	-	pF
C_{oss}	Output Capacitance		-	135	-	
C_{rss}	Reverse Transfer Capacitance		-	95	-	
• Switching Characteristics[d]						
Q_g	Total Gate Charge	V_{DS} = 10V, I_D = 8A,V_{GS} = 4.5V	-	14	-	nC
Q_{gs}	Gate-Source Charge		-	3.2	-	
Q_{gd}	Gate-Drain Charge		-	3.0	-	
$t_{d(on)}$	Turn-on Delay Time	V_{DD} = 10V, R_L = 1.2Ω,I_D = 1A, V_{GS} = 10V,R_{GEN} = 3W	-	5	-	nS
t_r	Turn-on Rise Time		-	12	-	
$t_{d(off)}$	Turn-off Delay Time		-	50	-	
t_f	Turn-off Fall Time		-	16	-	
R_g	Gate Resistance	V_{GS}=0V,V_{DS}=0V,Frequency = 1MHz	-	1.5	-	KΩ
• Drain-Source Diode Characteristics						
V_{SD}	Drain-Source Diode Forward Voltage	V_{GS}=0V, I_S=1.5A	-	-	1.2	V

Note: c : Pulse Test : Pulse Width < 300μs, Duty Cycle < 2%
d: Guaranteed by design, not subject to production testing.



Switching Test Circuit and Switching Waveforms

Characteristics Curve

Figure.1 Output Characteristics

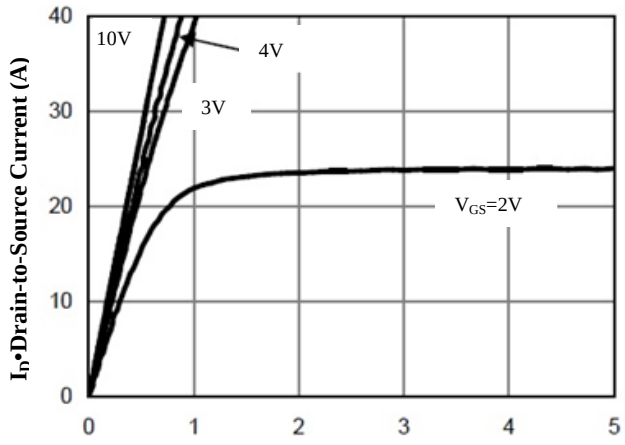


Figure.2 Transfer Characteristics

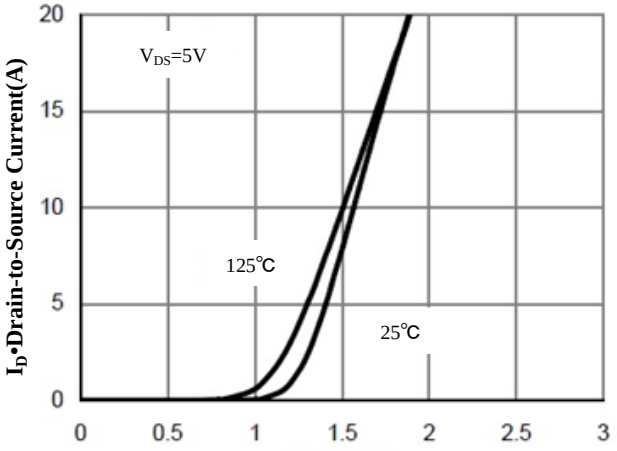


Figure.3 On-Resistance vs Drain Voltage

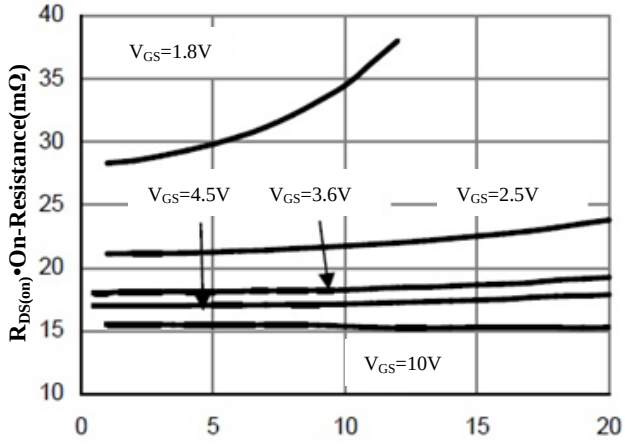


Figure.4 On-Resistance vs. Junction Temperature

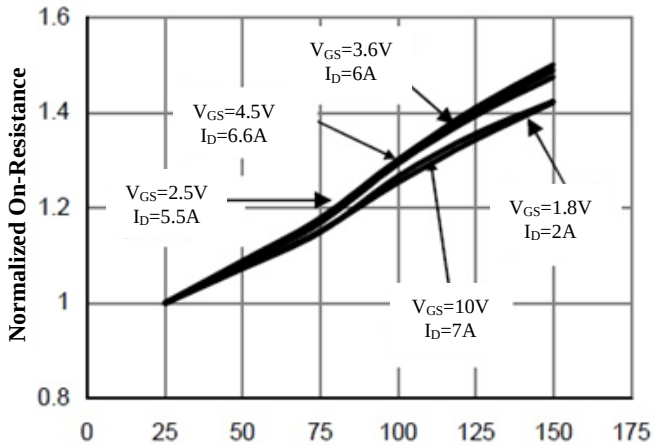


Figure.5 On-Resistance vs.Drain Current and Gate Voltage

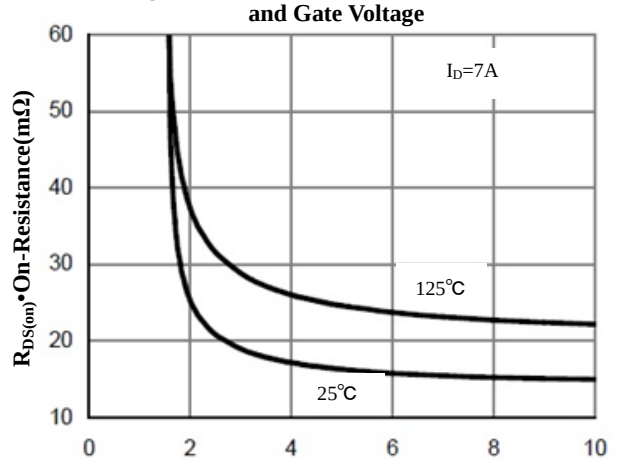
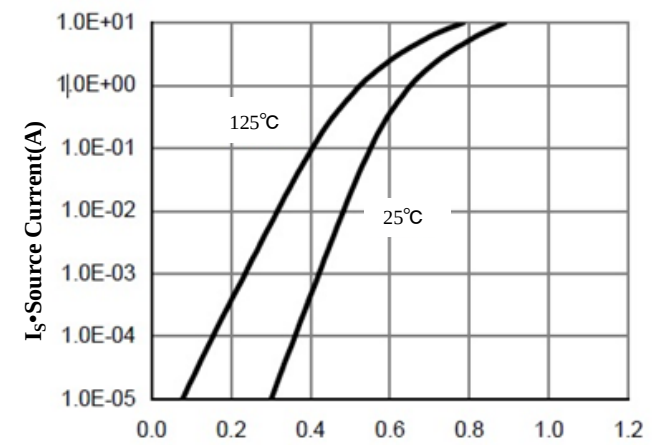


Figure.6 Body-Diode Characteristics



Characteristics Curve

Figure.7 Gate Charge Characteristics

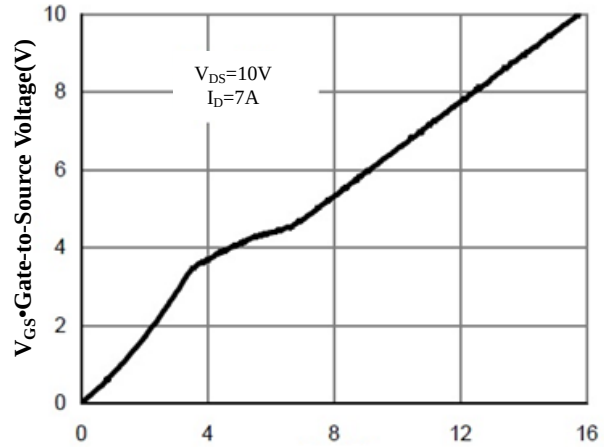


Figure.8 Capacitance Characteristics

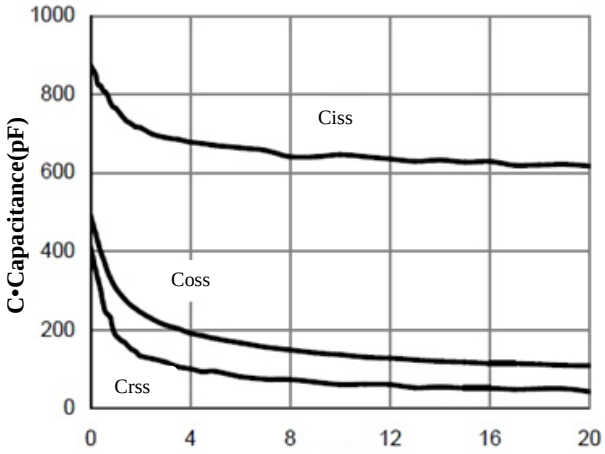


Figure.9 Maximum Forward Biased Safe Operating Area

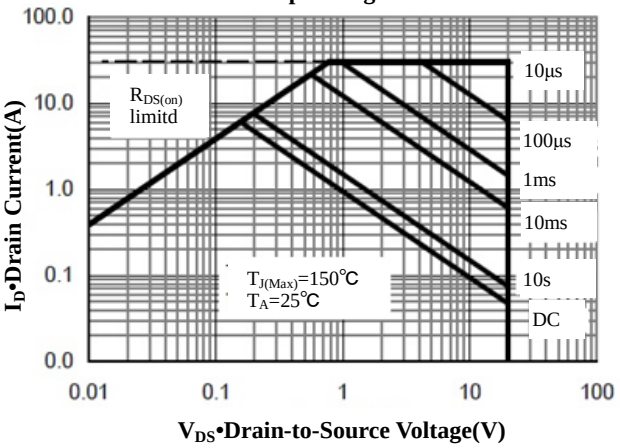


Figure.10 Sigle Pulse Power Rating Junction-to-Ambient

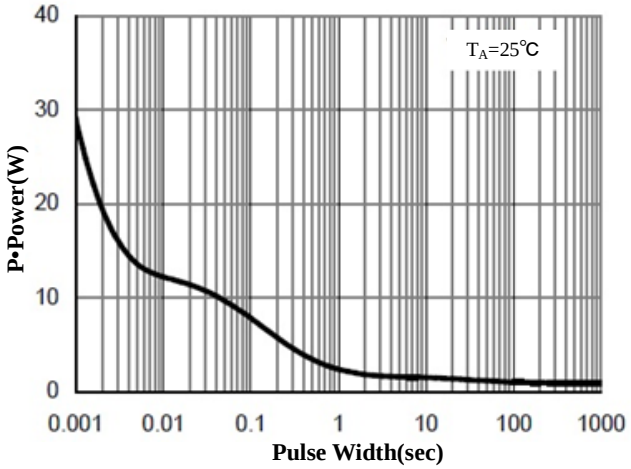
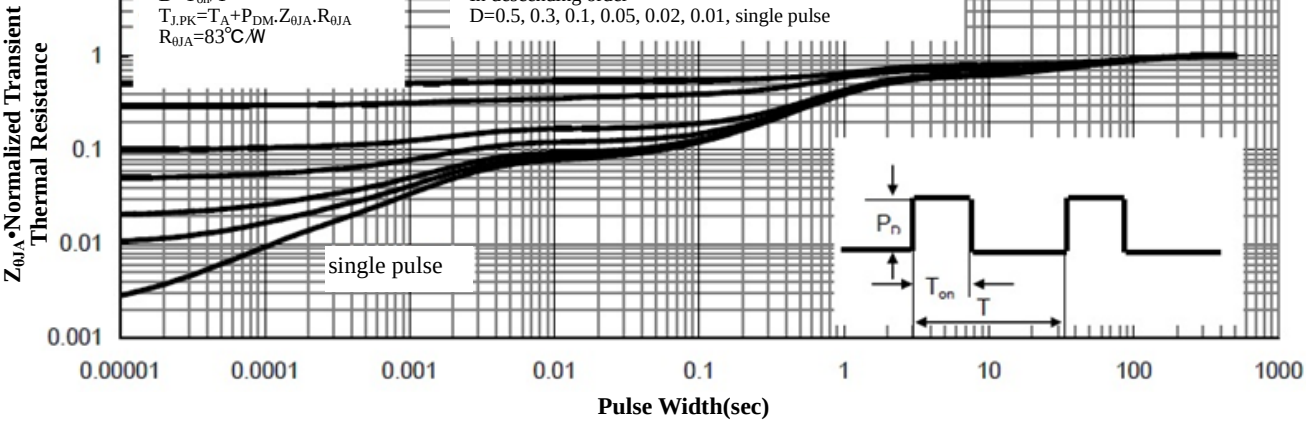
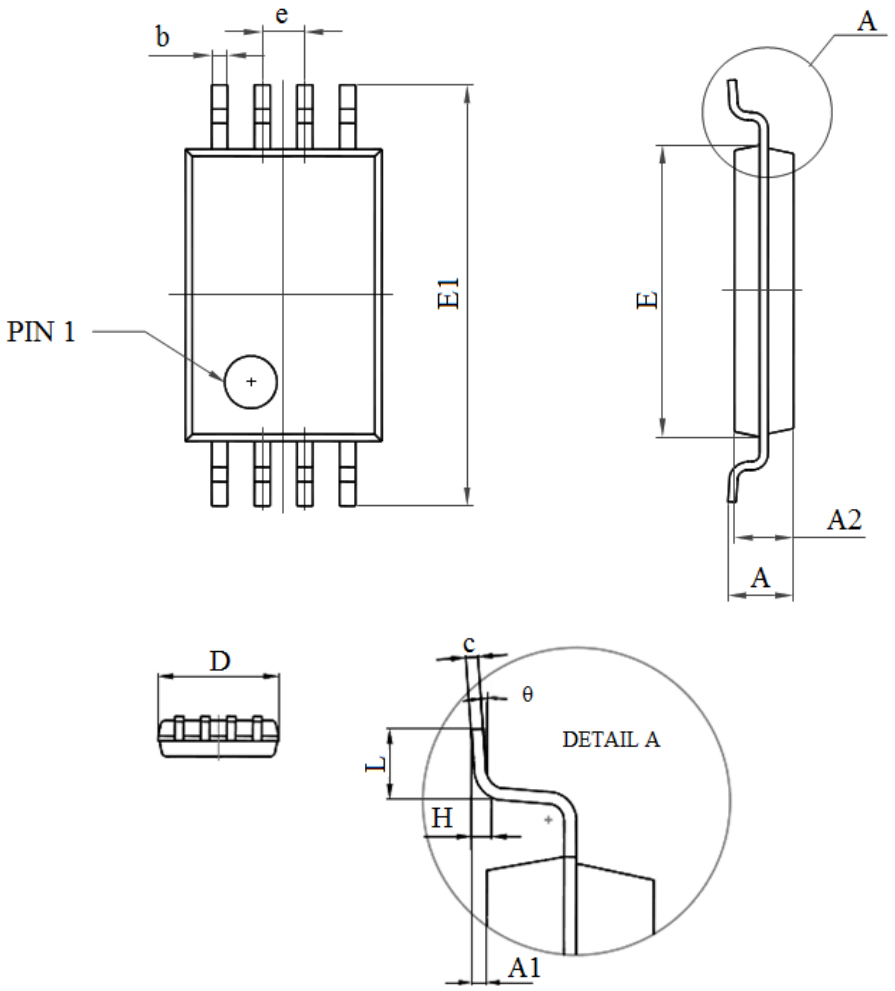


Figure.11 Normalized Thermal Transient Impedance



TSSOP-8 PACKAGE OUTLINE DIMENSIONS



Symbol	Dimensions In Millimeters(MM)		Dimensions In Inches(MIL)	
	Min	Max	Min	Max
D	2.900	3.160	0.114	0.124
E	4.300	4.500	0.169	0.177
b	0.190	0.300	0.007	0.012
c	0.090	0.200	0.004	0.008
E1	6.250	6.550	0.246	0.258
A		1.200		0.047
A2	0.800	1.000	0.031	0.039
A1	0.050	0.150	0.002	0.006
e	0.65(BSC)		0.026(BSC)	
L	0.500	0.700	0.020	0.028
H	0.25(TYP)		0.01(TYP)	
θ	1^o	7^o	1^o	7^o

Notice

1. Specification of the products displayed herein is subject to change without notice. Continuous development may necessitate changes in technical data without notice. GEMMICRO or anyone on its behalf assumes no responsibility or liability for any errors or inaccuracies.

2. Stresses beyond those listed under “Absolute Maximum Ratings” may cause permanent damage to the device. These are stress ratings only and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications are not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.