MSN01140A

V1.11 Datasheet

N-Channel 40V MOSFET

FEATURES

- Advance Trench Process Technology
- High Density Cell Design for Ultra Low On-resistance

PRODUCTY SUMMARY			
V_{DS} (V)	I_D (A)	$R_{DS(on)}$ m(Ω) Max	
40	600	1.1	@V_{GS}=10V
		1.5	@V_{GS}=4.5V

Application

- DC/DC converters
- Battery Protection
- Consumer Electronics

Mechanical

- Case:TOLL Package

TOLL

Packing Information

Package	Packing
TOLL	2000EA/13" Reel

Maximum Ratings (T_A=25°C unless otherwise specified)			
Parameter	**Symbol**	**Limit**	**Unit**
Drain-Source Voltage	V_{DS}	40	V
Gate-Source Voltage	V_{GS}	±20	V
Drain Current, V_{GS} @10V (Silicon Limited) [1)3)]	I_D	600	A
Drain Current, V_{GS}@10V (Wire Bond Limited) [1)3)]	I_D	400	A
Peak Drain Current, Pulsed [1)2)3)]	I_{DM}	640	A
Maximum Power Dissipation [1)]	P_{tot}	500	W
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 to 175	°C

Typical Thermal Resistance			
Parameter	**Symbol**	**Limit**	**Unit**
Junction-to-Ambient Thermal Resistance [1)]	$R_{\theta JA}$	42	°C/W
Junction-to-Ambient Thermal Resistance [1)]	$R_{\theta JC}$	0.25	°C/W

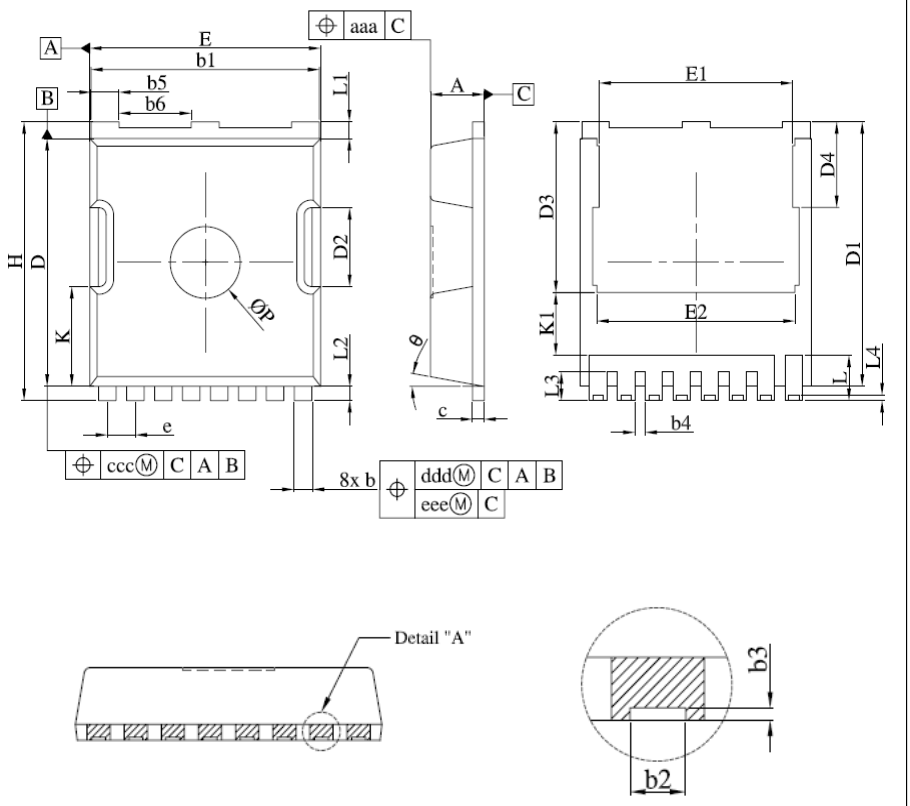
Note:
1. Surface Mounted on a 1 in2 pad area, t≦10sec
2. Pulse width≦300us, Duty cycle≦2%.
3. Limited by bonding wire
4. Essentially independent of operating temperature typical characteristics.
5. Repetitive rating, pulse width limited by junction temperature $T_{J(MAX)}$=150°C. Ratings are based on low frequency and duty cycles to keep initial T_J =25°C.
6. The maximum current rating is package limited.
7. Guaranteed by design, not subject to production testing.

Electrical Characteristics (T_A = 25°C UNLESS OTHERWISE NOTED)						
Characteristics	Symbol	Test Condition	Limits			Unit
			Min	Typ	Max	
Static						
Drain-Source Breakdown Voltage	B_{VDSS}	V_{GS}=0V, I_D=250uA	40	-	-	V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250uA	1.00	1.50	2.50	V
Drain-Source On-State Resistance	$R_{DS(on)}$	V_{GS}=10.0V, I_D=95.0A	-	-	1.1	mΩ
		V_{GS}=4.5V, I_D=20.0A	-	-	1.5	mΩ
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=40V, V_{GS}=0V	-	-	1.0	uA
GateSource Leakage Current	I_{GSS}	V_{GS}=±20V, V_{DS}=0V	-	-	±100	nA
Dynamic [2]						
Total Gate Charge	Q_g	V_{DS}=20V, V_{GS}=10V, I_D=1.0A	-	352	-	nC
Total Gate Charge	Q_g	V_{DS}=20V, V_{GS}=4.5V, I_D=1.0A	-	171	-	nC
Gate-Source Charge	Q_{gs}		-	38	-	nC
Gate-Drain Charge	Q_{gd}		-	66	-	nC
Gate resistance	R_G	V_{DS}=20V, V_{GS}=0V, f=200KHz	-	0.82	–	Ω
Input Capacitance	C_{iss}		-	21865	-	pF
Output Capacitance	C_{oss}		-	1190	-	pF
Reverse Transfer Capacitance	C_{rss}		-	1155	-	pF
Switching						
Turn-On Delay Time	$t_{d(on)}$	V_{DS}=20V, R_L=10.0Ω, V_{GEN}=10V, R_G=3.0Ω	-	53	-	ns
Turn-On Rise Time	t_r		-	36	-	ns
Turn-Off Delay Time	$t_{d(off)}$		-	357	-	ns
Turn-Off Fall Time	t_f		-	100	-	ns
Drain-Source Diode						
Body-Diode Continuous Current	I_S	-	-	-	160	A
Diode Forward Voltage [1]	V_{SD}	I_{SD}=50A, V_{GS}=0V	-	-	1.3	V

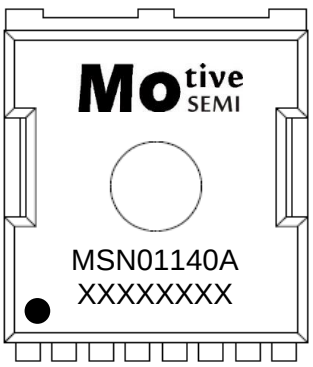
Note:
1. Pulse width<300us, Duty cycle<2%.
2. Guaranteed by design, not subject to production testing.

Package Outline Dimensions (inches and millimeters)

TOLL				
SYMBOL	Dimensions			
	Millimeters		Inches	
	Min	Max	Min	Max
A	2.20	2.40	0.087	0.094
b	0.70	0.90	0.028	0.035
b1	9.70	9.90	0.382	0.390
b2	0.36	0.55	0.014	0.022
b3	0.05	0.35	0.002	0.014
b4	0.30	0.50	0.012	0.020
b5	1.10	1.30	0.043	0.051
b6	3.00	3.20	0.118	0.126
c	0.40	0.60	0.016	0.024
D	10.28	10.55	0.405	0.415
D1	10.98	11.18	0.432	0.440
D2	3.20	3.40	0.126	0.134
D3	7.00	7.30	0.276	0.287
D4	3.44	3.74	0.135	0.147
e	1.10	1.30	0.043	0.051
E	9.80	10.00	0.386	0.394
E1	8.20	8.40	0.323	0.331
E2	8.35	8.65	0.329	0.341
H	11.50	11.85	0.453	0.467
K	4.08	4.28	0.161	0.169
K1	2.45	-	0.096	-
L	1.60	2.10	0.063	0.083
L1	0.50	0.90	0.020	0.035
L2	0.50	0.70	0.020	0.028
L3	1.00	1.30	0.039	0.051
L4	0.13	0.33	0.005	0.013
P	2.85	3.15	0.112	0.124
θ	10^{o} REF.			
aaa	0.20		0.008	
ccc	0.20		0.008	
ddd	0.25		0.010	
eee	0.20		0.008	



Marking Information



First line = Company name

MSN01140A = Product number

XXXXXXX = Tracking number

Fourth line = Gate pin point