

HAT1044M-EL-E-VB Datasheet P-Channel 30-V (D-S) MOSFET

PRODUCT SUMMARY						
V _{DS} (V)	$R_{DS(on)}\left(\Omega\right)$	I _D (A) ^a	Q _g (Typ.)			
- 30	$0.049 \text{ at V}_{GS} = -10 \text{ V}$	- 4.8	5.1 nC			
	0.054 at V _{GS} = - 4.5 V	- 4.1	5.1110			

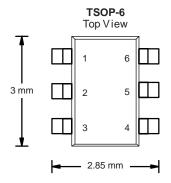
FEATURES

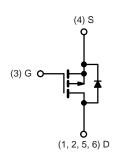
- Halogen-free According to IEC 61249-2-21 **Available**
- Trench Power MOSFET

COMPLIANT HALOGEN FREE

APPLICATIONS

· Load Switch





P-Channel MOSFET

ABSOLUTE MAXIMUM RATIN	GS $T_A = 25 ^{\circ}C$,	unless othe	rwise noted	
Parameter	Symbol	Limit	Unit	
Drain-Source Voltage	V_{DS}	- 30	V	
Gate-Source Voltage	V_{GS}	± 20	v	
	T _C = 25 °C		- 4.8	
Continuous Drain Current (T _{.1} = 150 °C)	T _C = 70 °C	1_	- 4.1	
Continuous Diam Current (1) = 130 C)	T _A = 25 °C	I _D	- 4.0 ^{b, c}	
	T _A = 70 °C		- 3.5 ^{b, c}	A
Pulsed Drain Current	Pulsed Drain Current		- 20	
	T _C = 25 °C		- 2.5	
Continuous Source-Drain Diode Current	T _A = 25 °C	I _S	- 1.67 ^{b, c}	
	T _C = 25 °C		3.0	
Maximum Power Dissipation	T _C = 70 °C	P _D	2.0	W
Maximum Power Dissipation	T _A = 25 °C	1 ^{FD}	2.0 ^{b, c}	VV
	T _A = 70 °C		1.3 ^{b, c}	
Operating Junction and Storage Temperature	T _J , T _{stg}	- 55 to 150	°C	

THERMAL RESISTANCE RATINGS							
Parameter	Symbol	Typical	Maximum	Unit			
Maximum Junction-to-Ambient ^{b, d}	t ≤ 5 s	R_{thJA}	55	62.5	°C/W		
Maximum Junction-to-Foot (Drain)	Steady State	R_{thJF}	34	41	J/VV		

Notes:

- a. Based on T_C = 25 °C.
 b. Surface Mounted on 1" x 1" FR4 board.
- c. t = 5 s.
- d. Maximum under Steady State conditions is 110 °C/W.

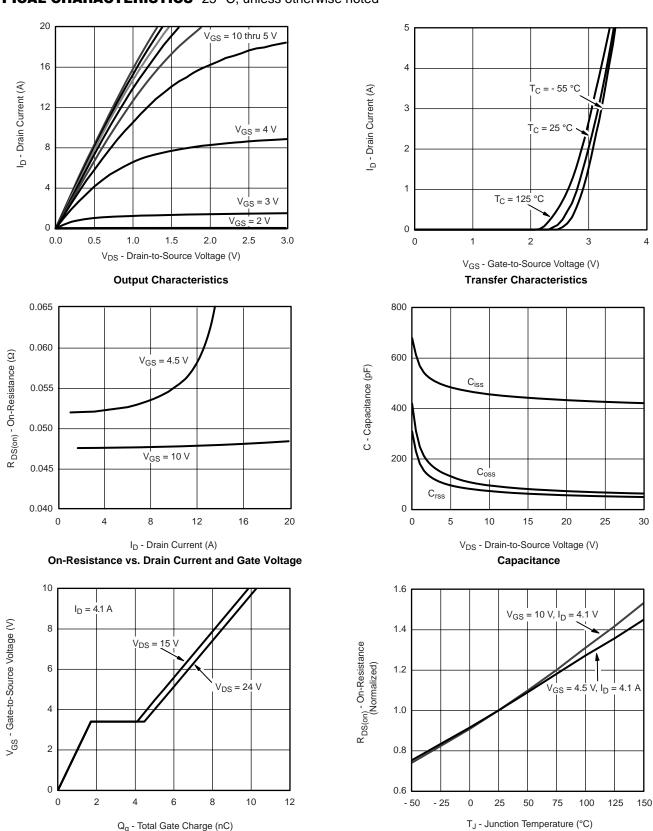


Parameter	Symbol	Test Conditions	Min.	Тур.	Max.	Unit
Static					l	
Drain-Source Breakdown Voltage	V _{DS}	$V_{GS} = 0 \text{ V}, I_D = -250 \mu\text{A}$	- 30			V
V _{DS} Temperature Coefficient	$\Delta V_{DS}/T_{J}$	J 250A		- 31		mV/°C
V _{GS(th)} Temperature Coefficient	$\Delta V_{GS(th)}/T_J$	I _D = - 250 μA		4.5		
Gate-Source Threshold Voltage	V _{GS(th)}	$V_{DS} = V_{GS}, I_{D} = -250 \mu A$	- 0.5		- 2.0	V
Gate-Source Leakage	I _{GSS}	$V_{DS} = 0 \text{ V}, V_{GS} = \pm 20 \text{ V}$			± 100	nA
- 0.111 1.0		V _{DS} = - 30 V, V _{GS} = 0 V			- 1	μΑ
Zero Gate Voltage Drain Current	IDSS	V _{DS} = - 30 V, V _{GS} = 0 V, T _J = 55 °C			- 10	
On-State Drain Current ^a	I _{D(on)}	$V_{DS} \le -5 \text{ V}, V_{GS} = -10 \text{ V}$	- 20			Α
_		V _{GS} = - 10 V, I _D = - 4.1 A		0.049		Ω
Drain-Source On-State Resistance ^a	R _{DS(on)}	V _{GS} = - 4.5 V, I _D = - 1.0 A		0.054		
Forward Transconductance ^a	9 _{fs}	V _{DS} = - 15 V, I _D = - 4.1 A		8		S
Dynamic ^b				<u> </u>		
Input Capacitance	C _{iss}			450		pF
Output Capacitance	C _{oss}	$V_{DS} = -15 \text{ V}, V_{GS} = 0 \text{ V}, f = 1 \text{ MHz}$		80		
Reverse Transfer Capacitance	C _{rss}			63		
Total Cata Charge	Qg	V _{DS} = - 15 V, V _{GS} = - 10 V, I _D = - 4.1 A		10	15	nC
Total Gate Charge				5.1	8	
Gate-Source Charge	Q_{gs}	$V_{DS} = -15 \text{ V}, V_{GS} = -4.5 \text{ V}, I_{D} = -4.1 \text{ A}$		1.8		
Gate-Drain Charge	Q_{gd}			2.5		
Gate Resistance	R_{g}	f = 1 MHz		7		Ω
Turn-On Delay Time	t _{d(on)}			40	60	
Rise Time	t _r	$V_{DD} = -15 \text{ V}, R_{L} = 4.6 \Omega$		80	120	1
Turn-Off Delay Time	t _{d(off)}	$I_D\cong$ - 3.3 A, V_{GEN} = - 4.5 V, R_g = 1 Ω		20	30	ns
Fall Time	t _f			12	20	
Turn-On Delay Time	t _{d(on)}			5	10	
Rise Time	t _r	V_{DD} = - 15 V, R_L = 4.6 Ω		13	20	
Turn-Off Delay Time	t _{d(off)}	$I_D\cong$ - 3.3 A, V_{GEN} = - 10 V, R_g = 1 Ω		20	30	
Fall Time	t _f			10	15	
Drain-Source Body Diode Characteristi	cs					
Continuous Source-Drain Diode Current	Is	T _C = 25 °C			- 2.5	^
Pulse Diode Forward Current ^a	I _{SM}				- 20] A
Body Diode Voltage	V _{SD}	I _S = - 3.3 A		- 0.8	- 1.2	V
Body Diode Reverse Recovery Time	t _{rr}			20	30	ns
Body Diode Reverse Recovery Charge	Q _{rr}	1 22 A di/d+ 400 A/ T 05 00		20	30	nC
Reverse Recovery Fall Time	t _a	$I_F = -3.3 \text{ A}, \text{ di/dt} = 100 \text{ A/}\mu\text{s}, T_J = 25 \text{ °C}$		14		
Reverse Recovery Rise Time		t _b		6		ns

- a. Pulse test; pulse width \leq 300 µs, duty cycle \leq 2 % b. Guaranteed by design, not subject to production testing.

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 is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.



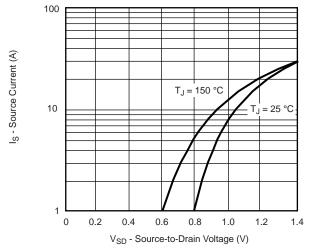


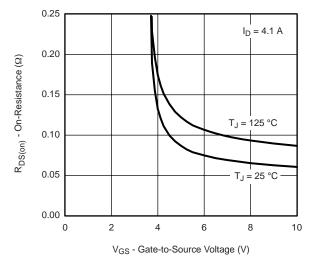
服务热线:400-655-8788

Gate Charge

On-Resistance vs. Junction Temperature

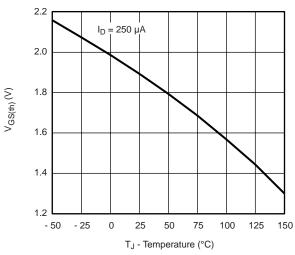


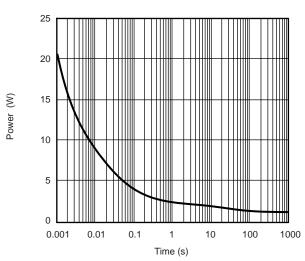




Source-Drain Diode Forward Voltage

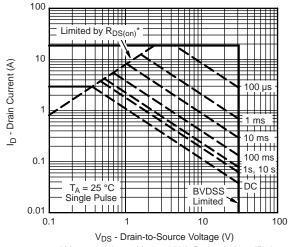






Threshold Voltage

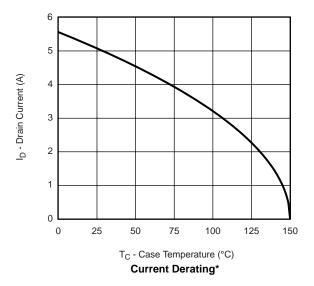
Single Pulse Power

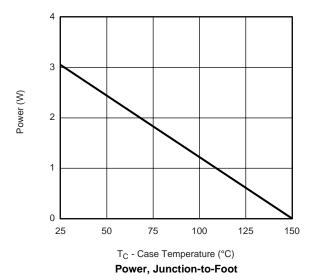


* V_{GS} > minimum V_{GS} at which $R_{DS(on)}$ is specified

Safe Operating Area

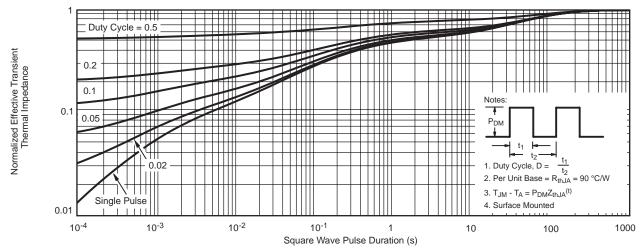




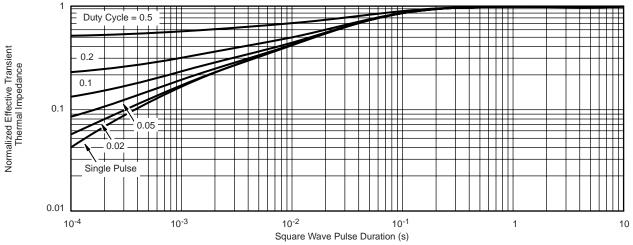


^{*} The power dissipation P_D is based on $T_{J(max)} = 150$ °C, using junction-to-case thermal resistance, and is more useful in settling the upper dissipation limit for cases where additional heatsinking is used. It is used to determine the current rating, when this rating falls below the package limit.





Normalized Thermal Transient Impedance, Junction-to-Ambient

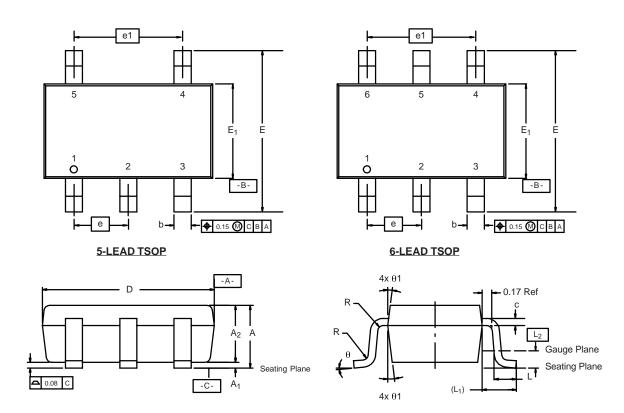


Normalized Thermal Transient Impedance, Junction-to-Foot



TSOP: 5/6-LEAD

JEDEC Part Number: MO-193C

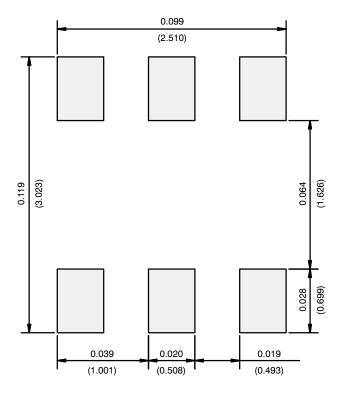


	MILLIMETERS			INCHES			
Dim	Min	Nom	Max	Min	Nom	Max	
Α	0.91	-	1.10	0.036	-	0.043	
A ₁	0.01	-	0.10	0.0004	-	0.004	
A ₂	0.90	-	1.00	0.035	0.038	0.039	
b	0.30	0.32	0.45	0.012	0.013	0.018	
С	0.10	0.15	0.20	0.004	0.006	0.008	
D	2.95	3.05	3.10	0.116	0.120	0.122	
Е	2.70	2.85	2.98	0.106	0.112	0.117	
E ₁	1.55	1.65	1.70	0.061	0.065	0.067	
е		0.95 BSC		0.0374 BSC			
e ₁	1.80	1.90	2.00	0.071	0.075	0.079	
L	0.32	-	0.50	0.012	-	0.020	
L ₁	0.60 Ref			0.024 Ref			
L ₂	0.25 BSC			0.010 BSC			
R	0.10	-	-	0.004	-	-	
θ	0°	4°	8°	0°	4°	8°	
θ_1	7° Nom			7° Nom			
ECN: C-06593-Rev. I, 18-Dec-06 DWG: 5540							

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RECOMMENDED MINIMUM PADS FOR TSOP-6



Recommended Minimum Pads Dimensions in Inches/(mm)



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