

#### N-Channel 30-V (D-S) MOSFET

#### FEATURES

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

#### Application

- Portable Devices
- Consumer Electronics

#### Mechanical

- Case: TO-252 Package

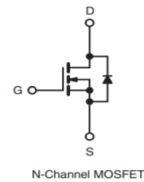
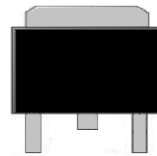
#### Packing Information

Package	Packing
TO-252	2.5K/13" Reel

#### PRODUCTY SUMMARY

$V_{DS}$	$R_{DS(on)}$ m( $\Omega$ )		$I_D$ (A)
30	6.0	$R_{dson}$ @10V	20
	7.6	$R_{dson}$ @4.5V	19

#### TO-252



#### Maximum Ratings ( $T_A=25^\circ\text{C}$ unless otherwise specified)

Parameter		Symbol	Limit	Unit
Drain-Source Voltage		$V_{DS}$	30	V
Gate-Source Voltage		$V_{GS}$	$\pm 20$	V
Continuous Drain Current (Note 4)	$T_C=25^\circ\text{C}$	$I_D$	20	A
Pulsed Drain Current (Note 1)	$T_C=25^\circ\text{C}$	$I_{DM}$	80	A
Power Dissipation	$T_C=25^\circ\text{C}$	$P_D$	3.2	W

#### Typical Thermal Resistance

Parameter		Symbol	Limit	Unit
Junction-to-Ambient Thermal Resistance	Junction to Case	$R_{\theta JC}$	1.39	$^\circ\text{C/W}$
Junction-to-Ambient Thermal Resistance	Junction to Ambient	$R_{\theta JA}$	100	$^\circ\text{C/W}$

#### NOTES :

1. Pulse width<300us, Duty cycle<2%.
2. Essentially independent of operating temperature typical characteristics.
3. Repetitive rating, pulse width limited by junction temperature  $T_J(\text{MAX})=150^\circ\text{C}$ . Ratings are based on low frequency and duty cycles to keep initial  $T_J=25^\circ\text{C}$ .
4. The maximum current rating is package limited.
5.  $R_{\theta JA}$  is the sum of the junction-to-case and case-to-ambient thermal resistance where the case thermal reference is defined as the solder mounting surface of the drain pins. Mounted on a 1 inch<sup>2</sup> with 2oz.square pad of copper.
6. The test condition is  $L=0.1\text{mH}$ ,  $I_{AS}=40\text{A}$ ,  $V_{DD}=25\text{V}$ ,  $V_{GS}=10\text{V}$ .
7. Guaranteed by design, not subject to production testing.

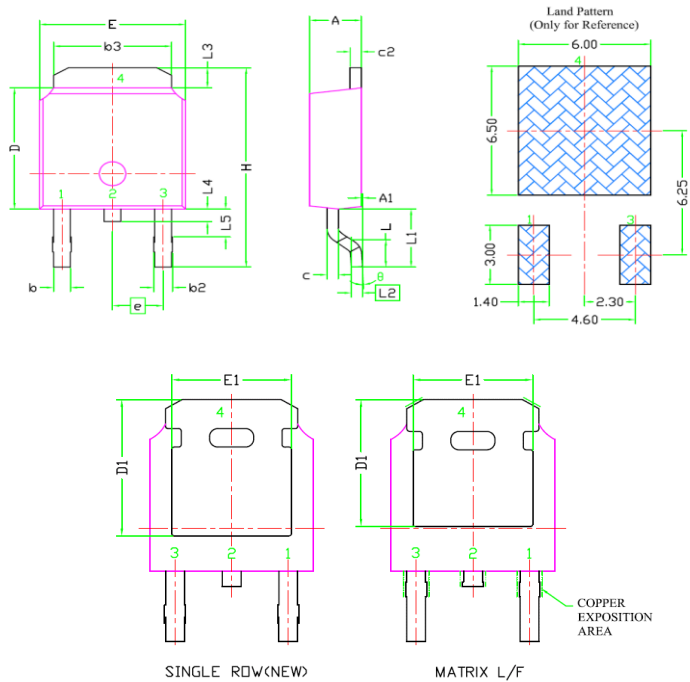
Electrical Characteristics (T <sub>A</sub> = 25°C UNLESS OTHERWISE NOTED)						
Characteristics	Symbol	Test Condition	Limits			Unit
			Min	Typ	Max	
Static						
Drain-Source Breakdown Voltage	B <sub>VDS</sub>	VGS = 0V, ID =250uA	30	-	-	V
Gate Threshold Voltage	VGS(th)	VDS=VGS, ID=250uA	1	1.55	2.5	V
Drain-Source On-State Resistance	RDS(on)	VGS=10.0V, ID=20.0A	-	4.0	6.0	mΩ
Drain-Source On-State Resistance	RDS(on)	VGS=4.5V, ID=19.0A	-	5.0	7.6	mΩ
Zero Gate Voltage Drain Current	IDSS	VDS=30V, VGS=0V	-	-	1.0	uA
Gate-Source Leakage Current	IGSS	VGS=±20V, VDS=0V	-	-	±100	nA
Dynamic <sup>3)</sup>						
Total Gate Charge	Qg	VDS=15V, ID=20A, VGS=4.5 (Note 2,3)	-	12	-	nC
Gate-Source Charge	Qgs		-	3.8	-	nC
Gate-Drain Charge	Qgd		-	4.3	-	nC
Input Capacitance	Ciss	VDS=25V, VGS=0V, f=1.0MHZ	-	1323	-	pF
Output Capacitance	Coss		-	219	-	pF
Reverse Transfer Capacitance	Crss		-	136	-	pF
Switching						
Turn-On Delay Time	td(on)	VDS=15V, RL=1Ω, VGS=10V, RG=3.3Ω (Note 2,3)	-	5	-	ns
Turn-On Rise Time	tr		-	42	-	ns
Turn-Off Delay Time	td(off)		-	36	-	ns
Turn-Off Fall Time	tf		-	5.5	-	ns
Drain-Source Diode						
Maximum Continuous Body Diode Forward Current	IS	-	-	-	1.2	A
Diode Forward Voltage	VSD	IS=1.0A, VGS=0V	-	-	1.5	V

Note:

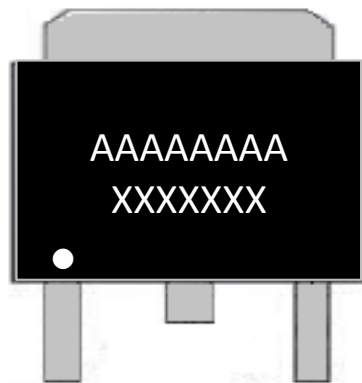
1. Pulse width<300us, Duty cycle<2%
2. Fused current that based on wire numbers and diameter
3. Guaranteed by design, not subject to production testing.

### Package Outline Dimensions ( inches and millimeters)

TO-252				
SYMBOL	Dimensions			
	Millimeters		Inches	
	Min	Max	Min	Max
E	6.40	6.73	0.252	0.265
L	1.40	1.77	0.055	0.070
L1	2.743 REF			
L2	0.508BSC			
L3	0.89	1.27	0.035	0.050
L4	0.64	1.01	0.025	0.040
L5	-	-	-	-
D	6.00	6.22	0.236	0.245
H	9.40	10.40	0.370	0.409
b	0.64	0.88	0.025	0.035
b2	0.77	1.14	0.030	0.045
b3	5.21	5.46	0.205	0.215
e	2.286BSC			
A	2.20	2.38	0.087	0.094
A1	0.00	0.13	0.000	0.005
c	0.46	0.60	0.018	0.024
c2	0.46	0.58	0.018	0.023
D1	5.21	-	0.205	-
E1	4.40	-	0.173	-
Θ	0°	10°	0°	10°



### Marking Information



First line:

AAAAA = Product number

XXXXXX = Tracking number

Third line: Gate Pin Point

Motive reserves the right to make changes without further notice to any products herein. Motive makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does Motive assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. "Typical" parameters which may be provided in Motive data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. Motive does not convey any license under its patent rights nor the rights of others. Motive products are not designed, intended, or authorized for use as components in systems intended for surgical implant into the body, or other applications intended to support or sustain life, or for any other application in which the failure of the Motive product could create a situation where personal injury or death may occur. Should Buyer purchase or use Motive products for any such unintended or unauthorized application, Buyer shall indemnify and hold Motive and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that Motive was negligent regarding the design or manufacture of the part.