



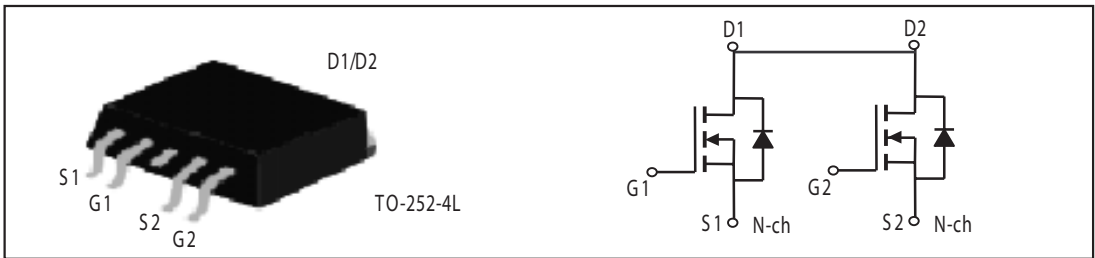
## Dual N-Channel Enhancement Mode Field Effect Transistor

### PRODUCT SUMMARY

V <sub>DSS</sub>	I <sub>D</sub>	R <sub>DS(ON)</sub> (mΩ) Max
40V	16A	30 @ V <sub>GS</sub> = 10V
		40 @ V <sub>GS</sub> = 4.5V

### FEATURES

- Super high dense cell design for low R<sub>DS(ON)</sub>.
- Rugged and reliable.
- TO252-4L package.



### ABSOLUTE MAXIMUM RATINGS (T<sub>A</sub>=25°C unless otherwise noted)

Parameter	Symbol	Limit	Unit	
Drain-Source Voltage	V <sub>DS</sub>	40	V	
Gate-Source Voltage	V <sub>GS</sub>	±20	V	
Drain Current-Continuous @ T <sub>a</sub>	I <sub>D</sub>	25°C	16	A
		70°C	13.8	A
-Pulsed <sup>a</sup>	I <sub>DM</sub>	50	A	
Drain-Source Diode Forward Current	I <sub>S</sub>	8	A	
Maximum Power Dissipation	P <sub>D</sub>	T <sub>a</sub> =25°C	11	W
		T <sub>a</sub> =70°C	7.7	
Operating Junction and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 to 175	°C	

### THERMAL CHARACTERISTICS

Thermal Resistance, Junction-to-Case	R <sub>θJC</sub>	13.6	°C/W
Thermal Resistance, Junction-to-Ambient	R <sub>θJA</sub>	120	°C/W

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ELECTRICAL CHARACTERISTICS (T<sub>A</sub> = 25°C unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ <sup>c</sup>	Max	Unit
<b>OFF CHARACTERISTICS</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	V <sub>GS</sub> = 0V, I <sub>D</sub> = 250uA	40			V
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> = 32V, V <sub>GS</sub> = 0V			1	uA
Gate-Body Leakage	I <sub>GSS</sub>	V <sub>GS</sub> = ± 20V, V <sub>DS</sub> = 0V			±100	nA
<b>ON CHARACTERISTICS<sup>b</sup></b>						
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250uA	1	1.8	3.0	V
Drain-Source On-State Resistance	R <sub>DS(ON)</sub>	V <sub>GS</sub> = 10V, I <sub>D</sub> = 8A		23	30	m-ohm
		V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 6A		32	40	m-ohm
On-State Drain Current	I <sub>D(ON)</sub>	V <sub>DS</sub> = 5V, V <sub>GS</sub> = 4.5V	10			A
Forward Transconductance	g <sub>FS</sub>	V <sub>DS</sub> = 5V, I <sub>D</sub> = 8A		12		S
<b>DYNAMIC CHARACTERISTICS<sup>c</sup></b>						
Input Capacitance	C <sub>ISS</sub>	V <sub>DS</sub> = 25V, V <sub>GS</sub> = 0V f = 1.0MHz		770		pF
Output Capacitance	C <sub>OSS</sub>			103		pF
Reverse Transfer Capacitance	C <sub>RSS</sub>			65		pF
<b>SWITCHING CHARACTERISTICS<sup>c</sup></b>						
Turn-On Delay Time	t <sub>D(ON)</sub>	V <sub>DD</sub> = 20V, I <sub>D</sub> = 1A, V <sub>GS</sub> = 10V, R <sub>L</sub> = 20 ohm R <sub>GEN</sub> = 6 ohm		13		ns
Rise Time	t <sub>r</sub>			10		ns
Turn-Off Delay Time	t <sub>D(OFF)</sub>			27		ns
Fall Time	t <sub>f</sub>			6		ns
Total Gate Charge (10V)	Q <sub>g</sub>	V <sub>DS</sub> = 28V, I <sub>D</sub> = 8A, V <sub>GS</sub> = 10V		17		nC
Total Gate Charge (4.5V)	Q <sub>g</sub>			8.7		nC
Gate-Source Charge	Q <sub>gs</sub>			1.9		nC
Gate-Drain Charge	Q <sub>gd</sub>			4.5		nC

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## ELECTRICAL CHARACTERISTICS ( $T_c=25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
<b>DRAIN-SOURCE DIODE CHARACTERISTICS <sup>a</sup></b>						
Diode Forward Voltage	$V_{SD}$	$V_{GS} = 0V, I_s = 8A$		0.96	1.3	V

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### Notes

- a. Pulse Test: Pulse Width  $\leq 300\mu s$ , Duty Cycle  $\leq 2\%$ .
- b. Guaranteed by design, not subject to production testing.

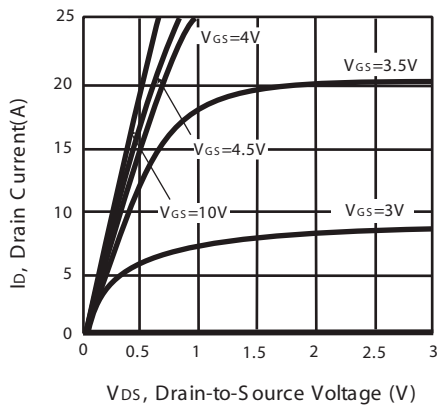


Figure 1. Output Characteristics

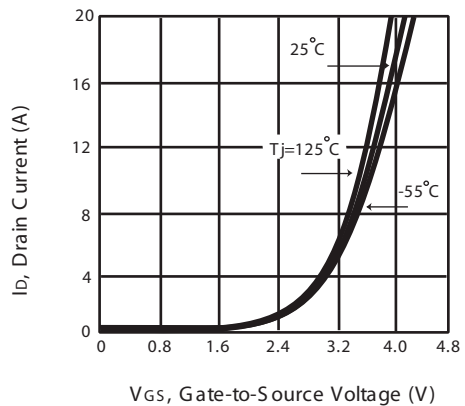


Figure 2. Transfer Characteristics

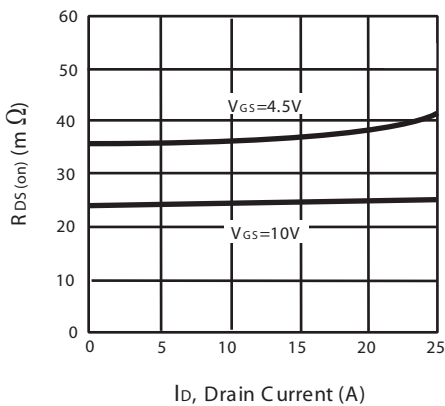


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

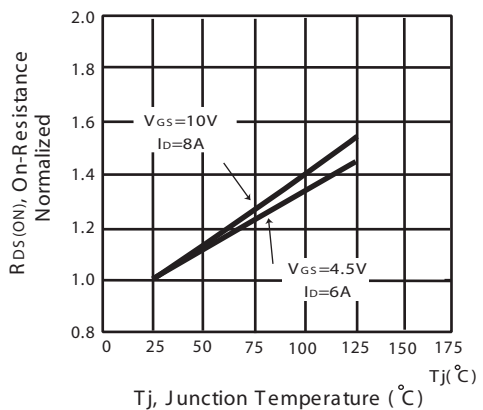


Figure 4. On-Resistance Variation with Drain Current and Temperature

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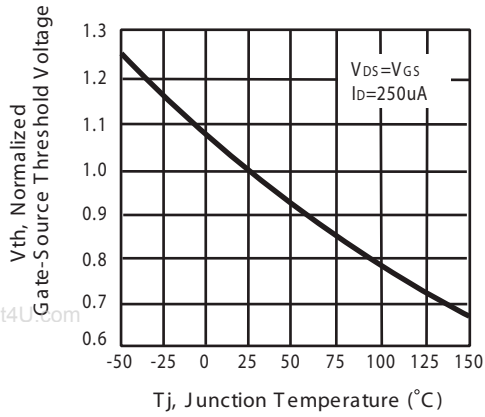


Figure 5. Gate Threshold Variation with Temperature

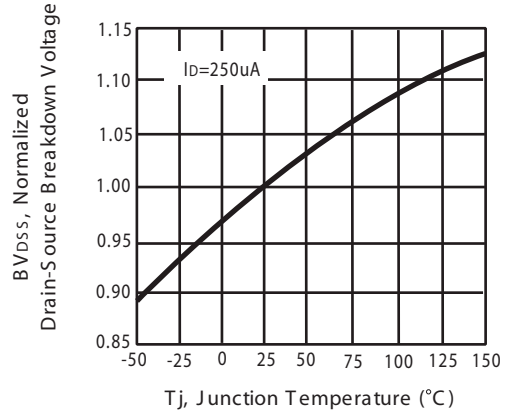


Figure 6. Breakdown Voltage Variation with Temperature

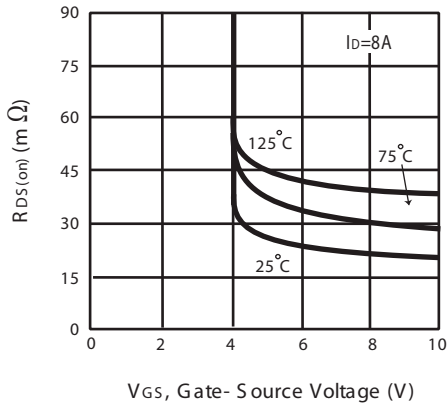


Figure 7. On-Resistance vs. Gate-Source Voltage

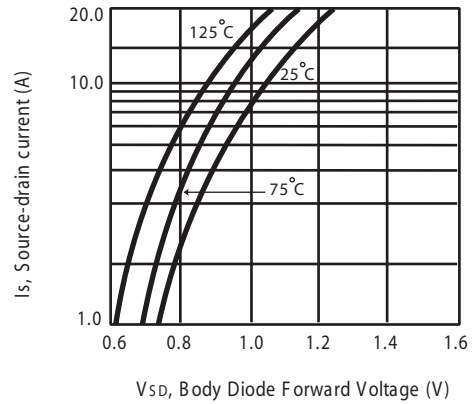


Figure 8. Body Diode Forward Voltage Variation with Source Current

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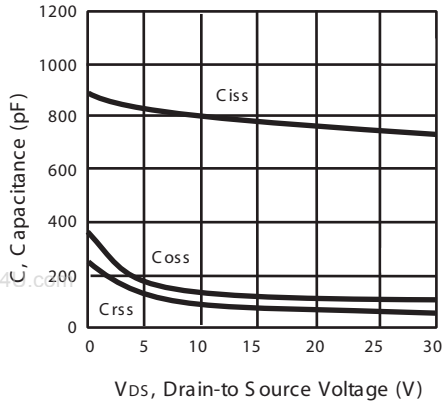


Figure 9. Capacitance

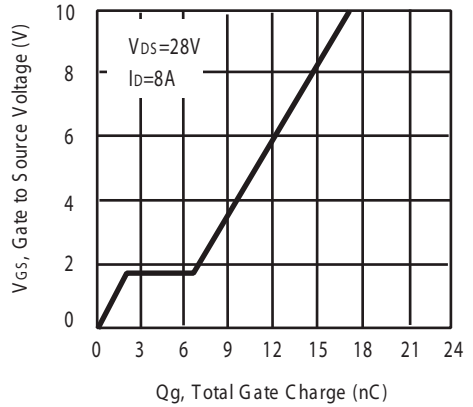


Figure 10. Maximum Safe Operating Area

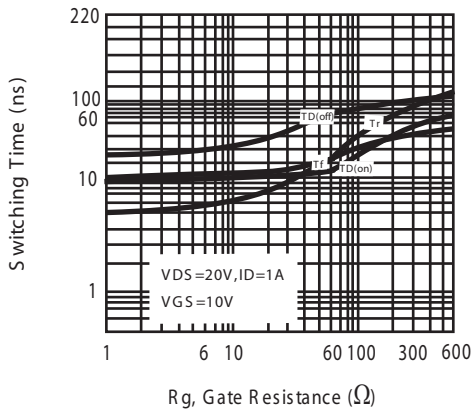


Figure 11. switching characteristics

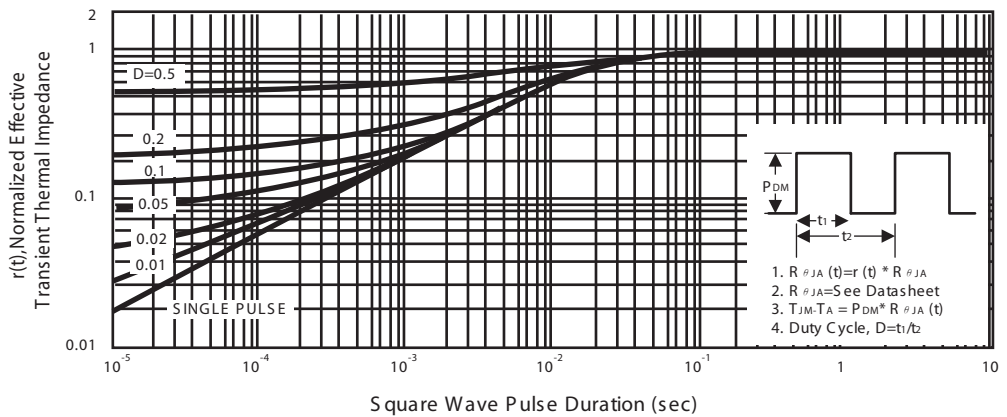
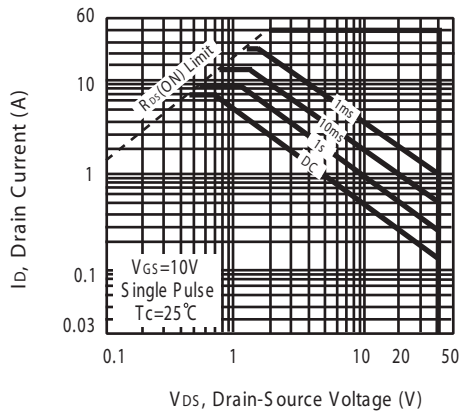
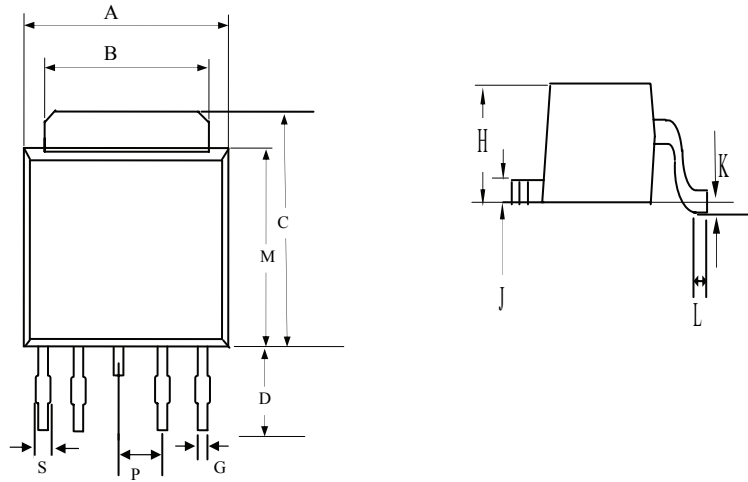


Figure 13. Normalized Thermal Transient Impedance [www.DataSheet4U.com](http://www.DataSheet4U.com)

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## PACKAGE OUTLINE DIMENSIONS

TO-252-4L

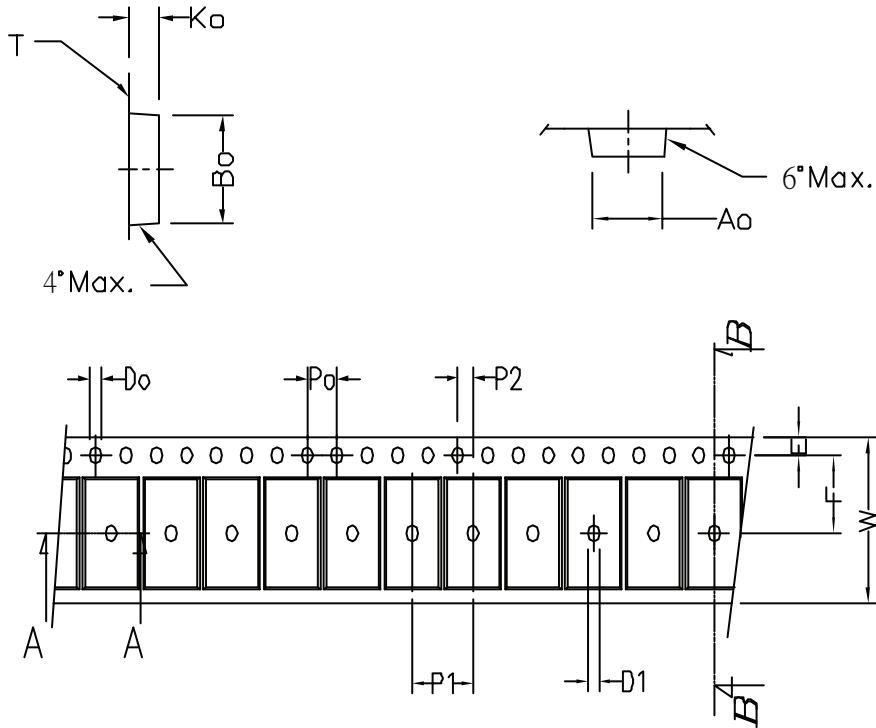


REF .	Millimeters	
	MIN	MAX
A	6.40	6.80
B	5.2	5.50
C	6.80	10.20
D	2.20	3.00
P	1.27 REF.	
S	0.50	0.80
G	0.40	0.60
H	2.20	2.40
J	0.45	0.60
K	0	0.15
L	0.90	1.50
M	5.40	5.80

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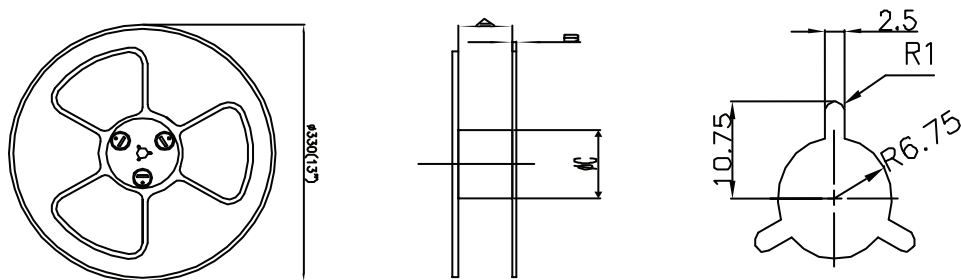
## TO-252-4L Tape and Reel Data

### TO-252-4L Carrier Tape



symbol	$A_0$	$B_0$	$K_0$	$P_0$	$P_1$	$P_2$	$T$
Spec	$6.96 \pm 0.1$	$10.49 \pm 0.1$	$2.79 \pm 0.1$	$4.0 \pm 0.1$	$8.0 \pm 0.10$	$2.0 \pm 0.05$	$0.33 \pm 0.013$
symbol	$E$	$F$	$D_0$	$D_1$	$W$	$10P_0$	
Spec	$1.75 \pm 0.1$	$7.5 \pm 0.05$	$1.55 \pm 0.05$	$1.5 \pm 0.25$	$16.0 \pm 0.3$	$40.0 \pm 0.2$	

### TO-252-4L Reel



UNIT:mm

Width of carrier tape	8	12	16	24	32	44	56
$A \pm 0.1$	9.4	13.4	17.4	25.4	33.4	45.4	57.4
$B$	2.3	2.3	2.3	2.3	2.3	2.3	2.3
$\phi C$	100	100	100	100	100	100	100