



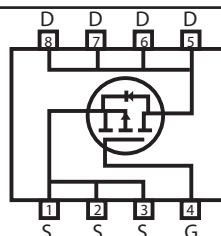
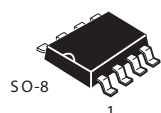
## P-Channel Enhancement Mode Field Effect Transistor

### PRODUCT SUMMARY

V <sub>DS</sub>	I <sub>D</sub>	R <sub>DS(ON)</sub> ( mΩ ) Max
-30V	-9A	20 @ V <sub>GS</sub> = -10V
		33 @ V <sub>GS</sub> = -4.5V

### FEATURES

- Super high dense cell design for low R<sub>DS(ON)</sub>.
- Rugged and reliable.
- Surface Mount Package.



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

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V <sub>DS</sub>	- 30	V
Gate-Source Voltage	V <sub>GS</sub>	± 25	V
Drain Current-Continuous <sup>a</sup> @ T <sub>j</sub> =25°C -Pulsed <sup>b</sup>	I <sub>D</sub>	- 9	A
	I <sub>DM</sub>	- 40	A
Drain-Source Diode Forward Current <sup>a</sup>	I <sub>S</sub>	- 1.7	A
Maximum Power Dissipation <sup>a</sup>	P <sub>D</sub>	2.5	W
Operating Junction and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 to 150	°C

### THERMAL CHARACTERISTICS

Thermal Resistance, Junction-to-Ambient <sup>a</sup>	R <sub>θJA</sub>	50	°C/W
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# STM4435

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

Parameter	Symbol	Condition	Min	Typ <sup>c</sup>	Max	Unit
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	V <sub>GS</sub> =0V, I <sub>D</sub> =-250uA	-30			V
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =-24V, 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
ON CHARACTERISTICS <sup>b</sup>						
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	V
Drain-Source On-State Resistance	R <sub>DS(ON)</sub>	V <sub>GS</sub> = -10V, I <sub>D</sub> = -9.0A		16.5	20	m-ohm
		V <sub>GS</sub> = -4.5V, I <sub>D</sub> = -7.0A		26	33	m-ohm
On-S tate Drain Current	I <sub>D(ON)</sub>	V <sub>DS</sub> = -5V, V <sub>GS</sub> = -10V	-20			A
Forward Transconductance	g <sub>FS</sub>	V <sub>DS</sub> = -15V, I <sub>D</sub> = - 9.0A		18		S
DYNAMIC CHARACTERISTICS <sup>c</sup>						
Input Capacitance	C <sub>ISS</sub>	V <sub>DS</sub> =-15V, V <sub>GS</sub> = 0V f =1.0MHz		1470		pF
Output Capacitance	C <sub>OSS</sub>			375		pF
Reverse Transfer Capacitance	C <sub>RSS</sub>			250		pF
SWITCHING CHARACTERISTICS <sup>c</sup>						
Turn-On Delay Time	t <sub>D(ON)</sub>	V <sub>D</sub> = -15V, I <sub>D</sub> = -1A, V <sub>GEN</sub> = - 10V, R <sub>GEN</sub> = 6 -ohm		22		ns
Rise Time	t <sub>r</sub>			40		ns
Turn-Off Delay Time	t <sub>D(OFF)</sub>			100		ns
Fall Time	t <sub>f</sub>			50		ns
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> =-15V, I <sub>D</sub> =-9A, V <sub>GS</sub> =-10V		30		nC
		V <sub>DS</sub> =-15V, I <sub>D</sub> =-9A, V <sub>GS</sub> =-4.5V		15		nC
Gate-Source Charge	Q <sub>gs</sub>	V <sub>DS</sub> =-15V, I <sub>D</sub> = -9A, V <sub>GS</sub> =-10V		3.4		nC
Gate-Drain Charge	Q <sub>gd</sub>			9.2		nC

# STM4435

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

Parameter	Symbol	Condition	Min	Typ <sup>c</sup>	Max	Unit
DRAIN-SOURCE DIODE CHARACTERISTICS <sup>b</sup>						
Diode Forward Voltage	$V_{SD}$	$V_{GS} = 0\text{V}, I_S = -1.7\text{A}$		-0.75	-1.2	V

### Notes

a.Surface Mounted on FR4 Board,  $t \leq 10\text{sec}$ .

b.Pulse Test:Pulse Width $\leq 300\mu\text{s}$ , Duty Cycle $\leq 2\%$ .

c.Guaranteed by design, not subject to production testing.

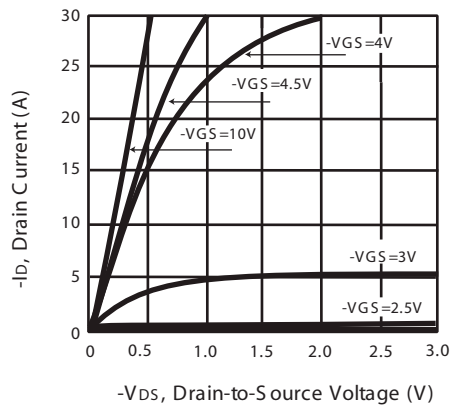


Figure 1. Output Characteristics

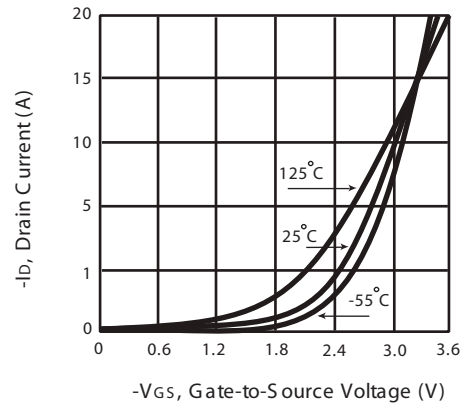


Figure 2. Transfer Characteristics

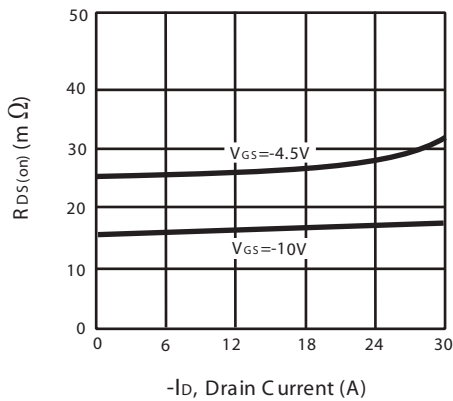


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

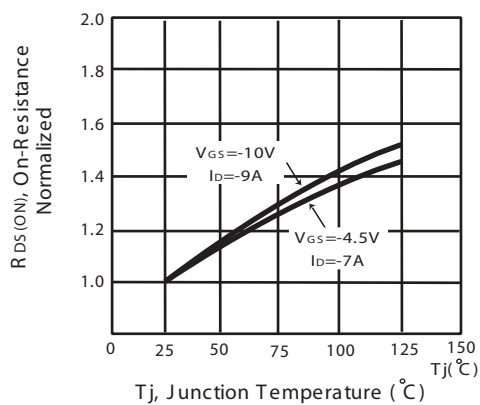
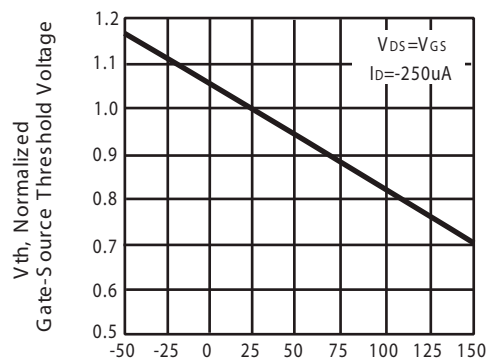


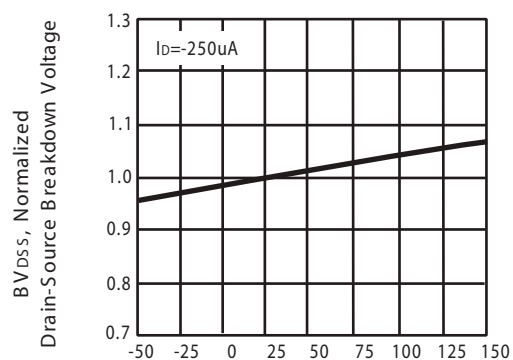
Figure 4. On-Resistance Variation with Drain Current and Temperature

# STM4435



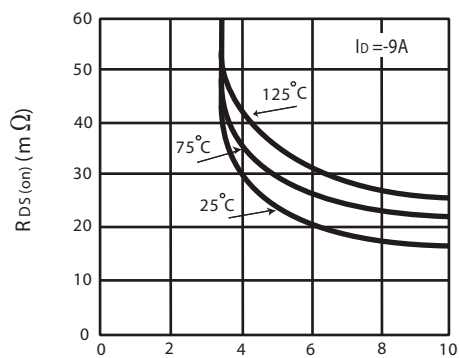
Tj, Junction Temperature (°C)

Figure 5. Gate Threshold Variation with Temperature



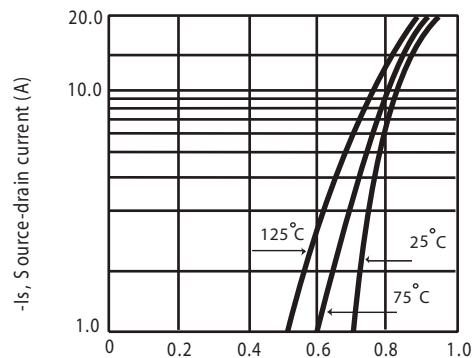
Tj, Junction Temperature (°C)

Figure 6. Breakdown Voltage Variation with Temperature



-VGS, Gate-Source Voltage (V)

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



-VSD, Body Diode Forward Voltage (V)

Figure 8. Body Diode Forward Voltage Variation with Source Current

# STM4435

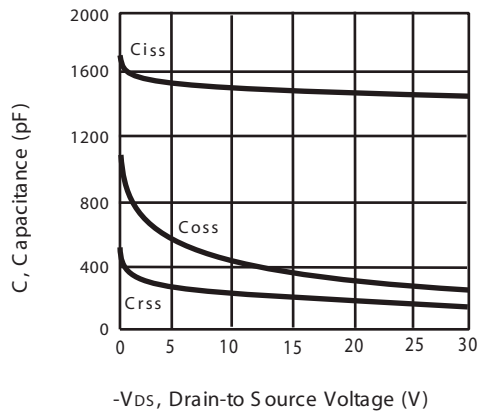


Figure 9. Capacitance

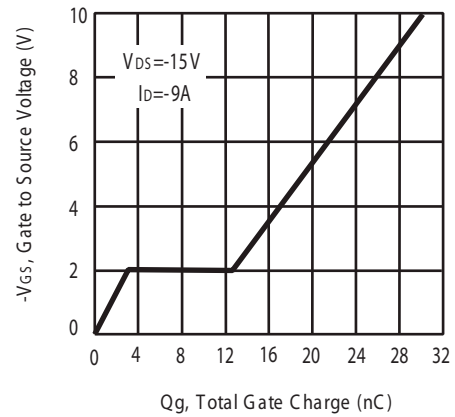


Figure 10. Gate Charge

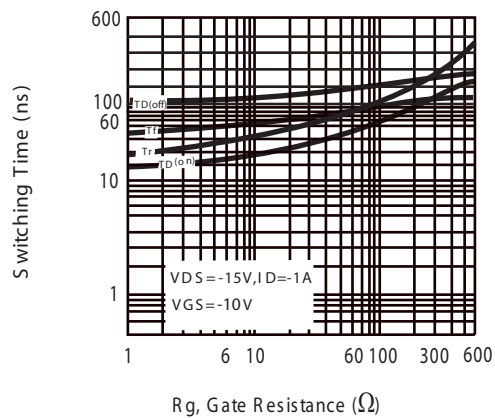


Figure 11. switching characteristics

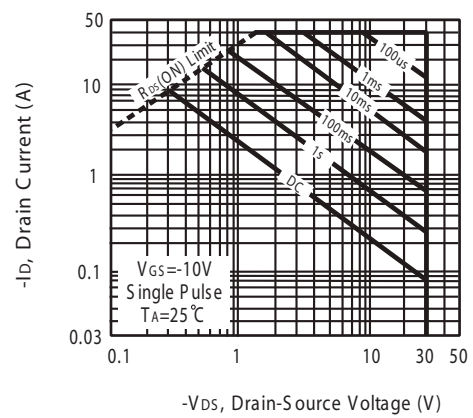


Figure 12. Maximum Safe Operating Area

# STM4435

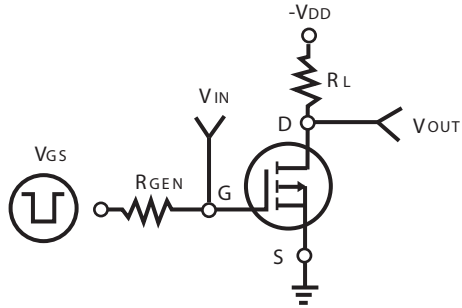


Figure 13. Switching Test Circuit

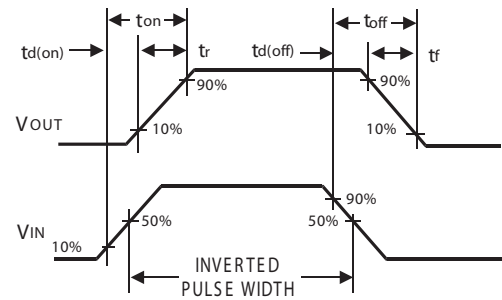


Figure 14. Switching Waveforms

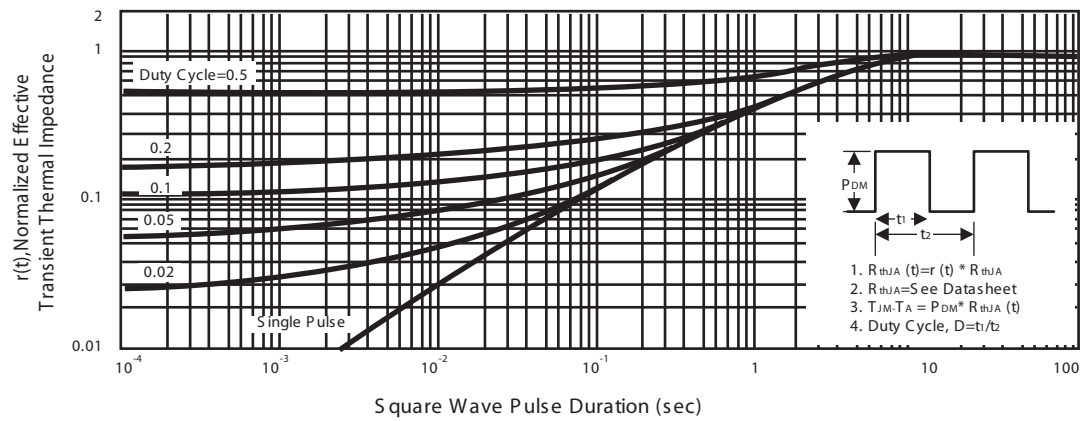
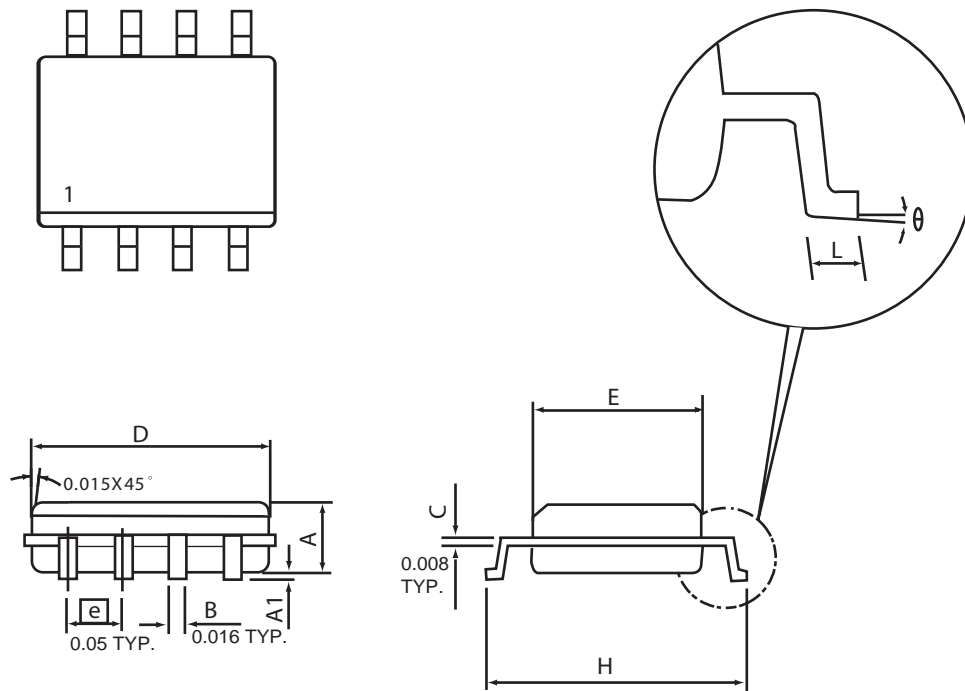


Figure 15. Normalized Thermal Transient Impedance Curve

# STM4435

## PACKAGE OUTLINE DIMENSIONS

### SO-8

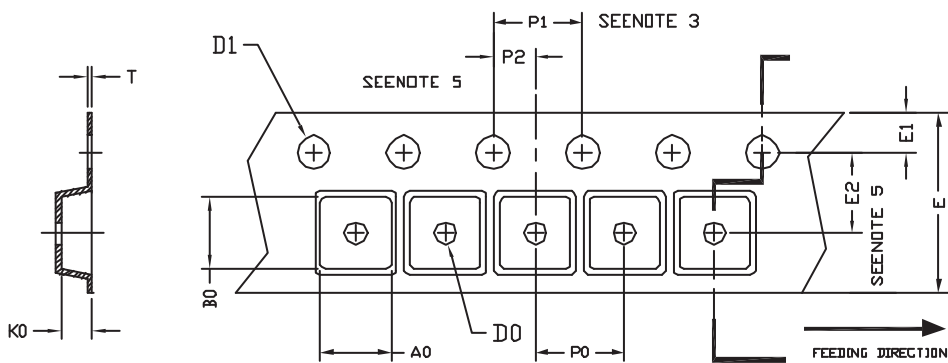


SYMBOLS	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	1.35	1.75	0.053	0.069
A1	0.10	0.25	0.004	0.010
D	4.80	4.98	0.189	0.196
E	3.81	3.99	0.150	0.157
H	5.79	6.20	0.228	0.244
L	0.41	1.27	0.016	0.050
$\theta$	0°	8°	0°	8°

# STM4435

## SO-8 Tape and Reel Data

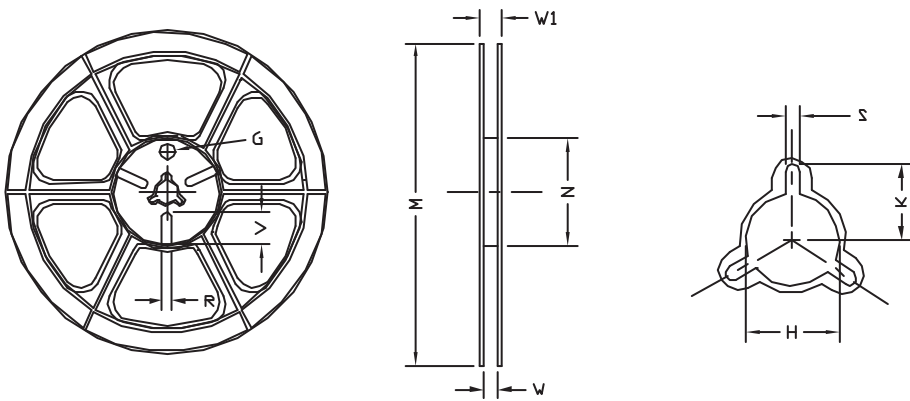
### SO-8 Carrier Tape



unit:mm

PACKAGE	A0	B0	K0	D0	D1	E	E1	E2	P0	P1	P2	T
SOP 8N 150mil	6.40	5.20	2.10	$\phi 1.5$ (MIN)	$\phi 1.5$ + 0.1 - 0.0	12.0 $\pm 0.3$	1.75	5.5 $\pm 0.05$	8.0	4.0	2.0 $\pm 0.05$	0.3 $\pm 0.05$

### SO-8 Reel



UNIT:mm

TAPE SIZE	REEL SIZE	M	N	W	W1	H	K	S	G	R	V
12 mm	$\phi 330$	330 $\pm 1$	62 $\pm 1.5$	12.4 + 0.2	16.8 - 0.4	$\phi 12.75$ + 0.15	---	2.0 $\pm 0.15$	---	---	---