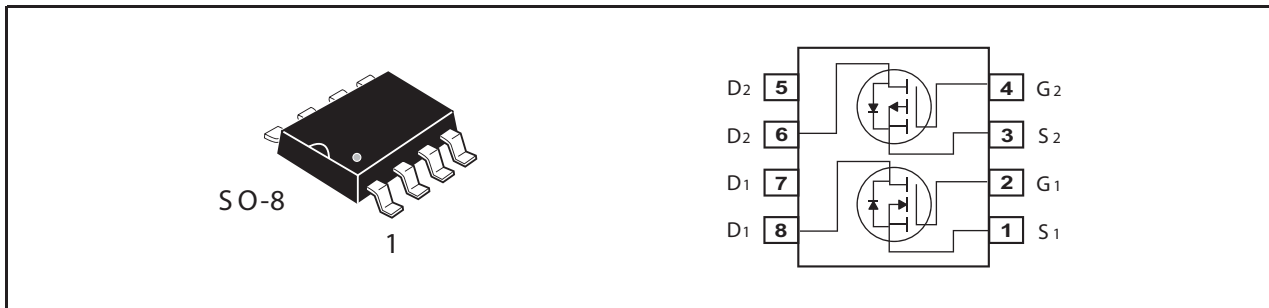




## Dual Enhancement Mode Field Effect Transistor (N and P Channel)

PRODUCT SUMMARY (N-Channel)		
VDSS	ID	RDS(ON) (mΩ) Max
40V	6.6A	29 @ VGS=10V
		45 @ VGS=4.5V

PRODUCT SUMMARY (P-Channel)		
VDSS	ID	RDS(ON) (mΩ) Max
-40V	-5.8A	38 @ VGS=-10V
		60 @ VGS=-4.5V



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

Symbol	Parameter	N-Channel	P-Channel	Units	
V <sub>DS</sub>	Drain-Source Voltage	40	-40	V	
V <sub>GS</sub>	Gate-Source Voltage	±20	±20	V	
I <sub>D</sub>	Drain Current-Continuous <sup>a</sup>	T <sub>C</sub> =25°C	6.6	-5.8	A
		T <sub>C</sub> =70°C	5.3	-4.6	A
I <sub>DM</sub>	-Pulsed <sup>b</sup>	24	-21	A	
E <sub>AS</sub>	Single Pulse Avalanche Energy <sup>d</sup>	36	30	mJ	
P <sub>D</sub>	Maximum Power Dissipation <sup>a</sup>	T <sub>C</sub> =25°C	2	W	
		T <sub>C</sub> =70°C	1.28	W	
T <sub>J</sub> , T <sub>STG</sub>	Operating Junction and Storage Temperature Range	-55 to 150		°C	

### THERMAL CHARACTERISTICS

R <sub>θJA</sub>	Thermal Resistance, Junction-to-Ambient <sup>a</sup>	62.5	°C/W
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# STM8362

Ver 1.1

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

Symbol	Parameter	Conditions	Min	Typ	Max	Units
<b>OFF CHARACTERISTICS</b>						
BV <sub>DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V , I <sub>D</sub> =250uA	40			V
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> =32V , V <sub>GS</sub> =0V			1	uA
I <sub>GSS</sub>	Gate-Body Leakage Current	V <sub>GS</sub> = ±20V , V <sub>DS</sub> =0V			±100	nA
<b>ON CHARACTERISTICS</b>						
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250uA	1.4	1.8	3	V
R <sub>DS(ON)</sub>	Drain-Source On-State Resistance	V <sub>GS</sub> =10V , I <sub>D</sub> =6.6A		23	29	m ohm
		V <sub>GS</sub> =4.5V , I <sub>D</sub> =5.3A		33	45	m ohm
g <sub>FS</sub>	Forward Transconductance	V <sub>DS</sub> =5V , I <sub>D</sub> =6.6A		18		S
<b>DYNAMIC CHARACTERISTICS <sup>c</sup></b>						
C <sub>ISS</sub>	Input Capacitance	V <sub>DS</sub> =20V, V <sub>GS</sub> =0V f=1.0MHz		755		pF
C <sub>OSS</sub>	Output Capacitance			81		pF
C <sub>RSS</sub>	Reverse Transfer Capacitance			67		pF
<b>SWITCHING CHARACTERISTICS <sup>c</sup></b>						
t <sub>D(ON)</sub>	Turn-On Delay Time	V <sub>DD</sub> =20V I <sub>D</sub> =1A V <sub>GS</sub> =10V R <sub>GEN</sub> = 6 ohm		12		ns
t <sub>r</sub>	Rise Time			14		ns
t <sub>D(OFF)</sub>	Turn-Off Delay Time			18		ns
t <sub>f</sub>	Fall Time			20		ns
Q <sub>g</sub>	Total Gate Charge	V <sub>DS</sub> =20V, I <sub>D</sub> =6.6A, V <sub>GS</sub> =10V		15		nC
		V <sub>DS</sub> =20V, I <sub>D</sub> =6.6A, V <sub>GS</sub> =4.5V		7.4		nC
Q <sub>gs</sub>	Gate-Source Charge	V <sub>DS</sub> =20V, I <sub>D</sub> =6.6A,		1.9		nC
Q <sub>gd</sub>	Gate-Drain Charge	V <sub>GS</sub> =10V		4.1		nC
<b>DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS</b>						
I <sub>S</sub>	Maximum Continuous Drain-Source Diode Forward Current				2.0	A
V <sub>SD</sub>	Diode Forward Voltage <sup>b</sup>	V <sub>GS</sub> =0V, I <sub>S</sub> =2.0A		0.82	1.3	V

Nov,12,2009

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

Symbol	Parameter	Conditions	Min	Typ	Max	Units
<b>OFF CHARACTERISTICS</b>						
BV <sub>DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V , I <sub>D</sub> =-250uA	-40			V
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> =-32V , V <sub>GS</sub> =0V			-1	uA
I <sub>GSS</sub>	Gate-Body Leakage Current	V <sub>GS</sub> = ±20V , V <sub>DS</sub> =0V			±100	nA
<b>ON CHARACTERISTICS</b>						
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =-250uA	-1.4	-2.0	-3	V
R <sub>DS(ON)</sub>	Drain-Source On-State Resistance	V <sub>GS</sub> =-10V , I <sub>D</sub> =-5.8A		30	38	m ohm
		V <sub>GS</sub> =-4.5V , I <sub>D</sub> =-4.6A		45	60	m ohm
g <sub>FS</sub>	Forward Transconductance	V <sub>DS</sub> =-5V , I <sub>D</sub> =-5.8A		18		S
<b>DYNAMIC CHARACTERISTICS <sup>c</sup></b>						
C <sub>ISS</sub>	Input Capacitance	V <sub>DS</sub> =-20V, V <sub>GS</sub> =0V f=1.0MHz		1000		pF
C <sub>OSS</sub>	Output Capacitance			123		pF
C <sub>RSS</sub>	Reverse Transfer Capacitance			107		pF
<b>SWITCHING CHARACTERISTICS <sup>c</sup></b>						
t <sub>D(ON)</sub>	Turn-On Delay Time	V <sub>DD</sub> =-20V I <sub>D</sub> =-1A V <sub>GS</sub> =-10V R <sub>GEN</sub> = 6 ohm		18		ns
t <sub>r</sub>	Rise Time			22		ns
t <sub>D(OFF)</sub>	Turn-Off Delay Time			65		ns
t <sub>f</sub>	Fall Time			20		ns
Q <sub>g</sub>	Total Gate Charge	V <sub>DS</sub> =-20V, I <sub>D</sub> =-5.5A, V <sub>GS</sub> =-10V		22		nC
		V <sub>DS</sub> =-20V, I <sub>D</sub> =-5.5A, V <sub>GS</sub> =-4.5V		10.7		nC
Q <sub>gs</sub>	Gate-Source Charge	V <sub>DS</sub> =-20V, I <sub>D</sub> =-5.5A, V <sub>GS</sub> =-10V		2.1		nC
Q <sub>gd</sub>	Gate-Drain Charge			6		nC
<b>DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS</b>						
I <sub>S</sub>	Maximum Continuous Drain-Source Diode Forward Current				-2.0	A
V <sub>SD</sub>	Diode Forward Voltage <sup>b</sup>	V <sub>GS</sub> =0V, I <sub>S</sub> =-2.0A		-0.81	-1.3	V

### Notes

- Surface Mounted on FR4 Board, t ≤ 10sec.
- Pulse Test: Pulse Width ≤ 300us, Duty Cycle ≤ 2%.
- Guaranteed by design, not subject to production testing.
- Starting T<sub>J</sub>=25°C, L=0.5mH, V<sub>DD</sub> = 20V, V<sub>GS</sub>=10V. (See Figure13)

## N-Channel

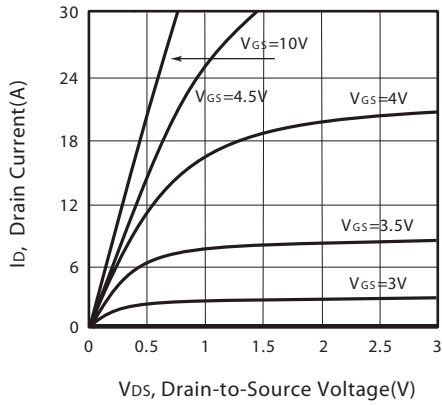


Figure 1. Output Characteristics

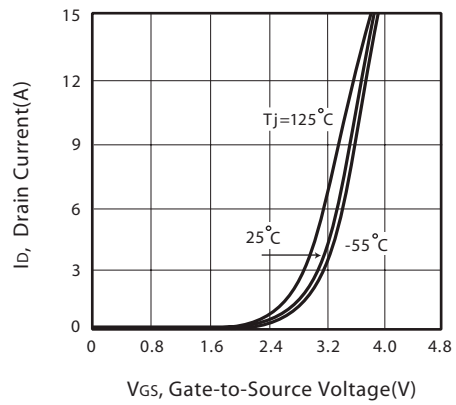


Figure 2. Transfer Characteristics

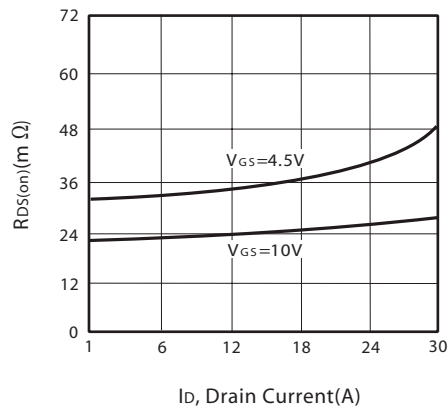


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

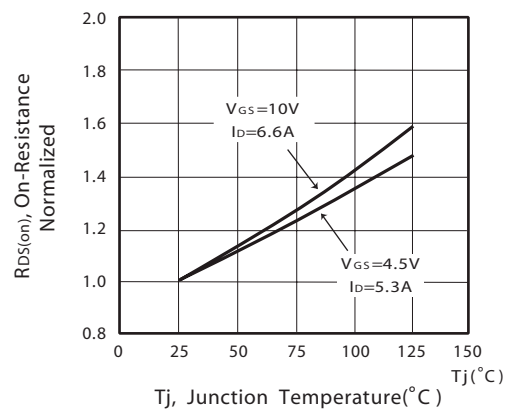


Figure 4. On-Resistance Variation with Drain Current and Temperature

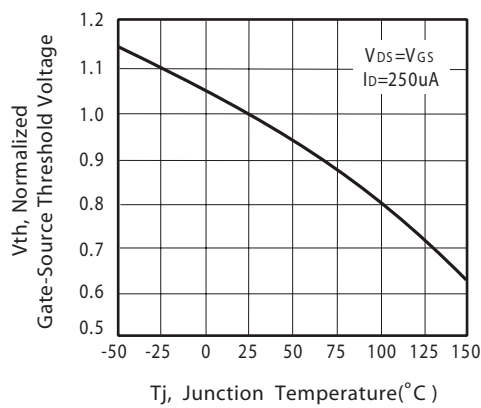


Figure 5. Gate Threshold Variation with Temperature

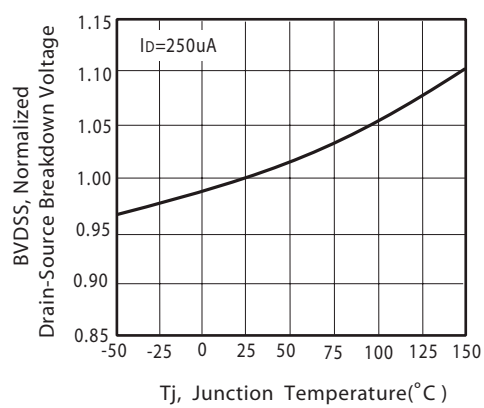


Figure 6. Breakdown Voltage Variation with Temperature

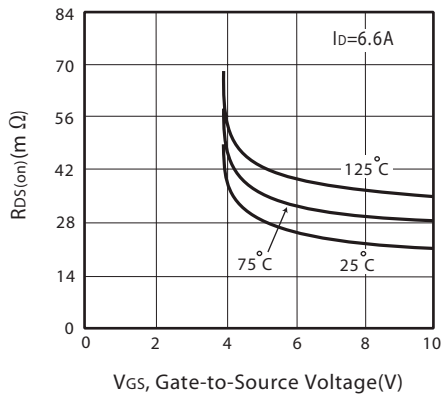


Figure 7. On-Resistance vs. Gate-Source Voltage

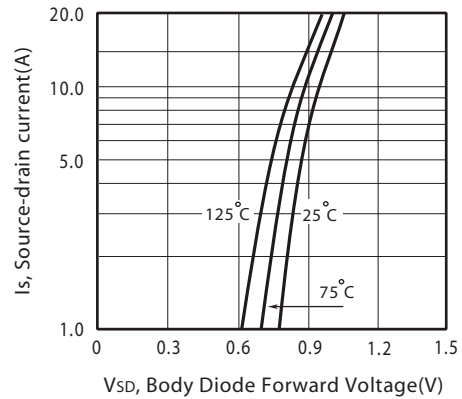


Figure 8. Body Diode Forward Voltage Variation with Source Current

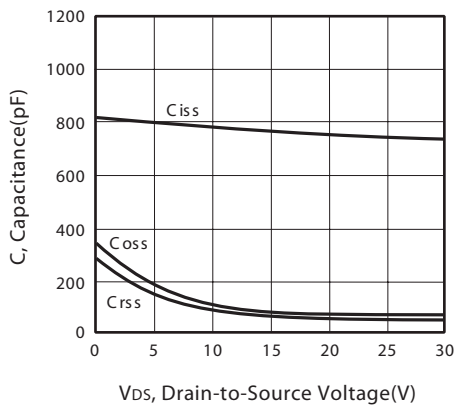


Figure 9. Capacitance

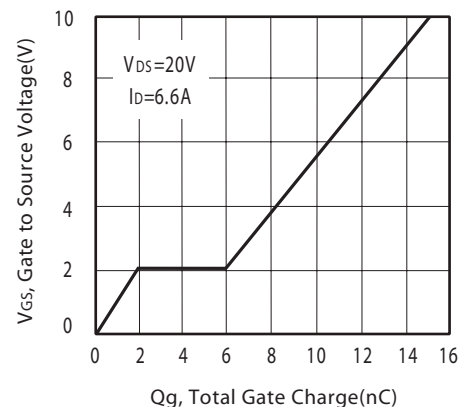


Figure 10. Gate Charge

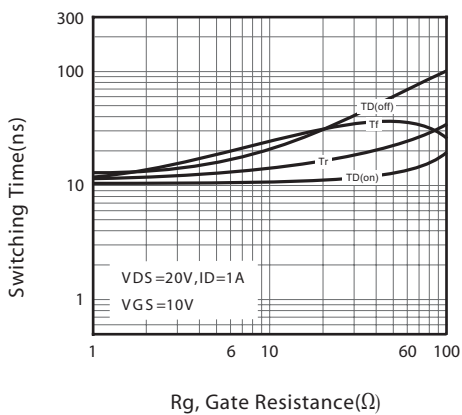


Figure 11. switching characteristics

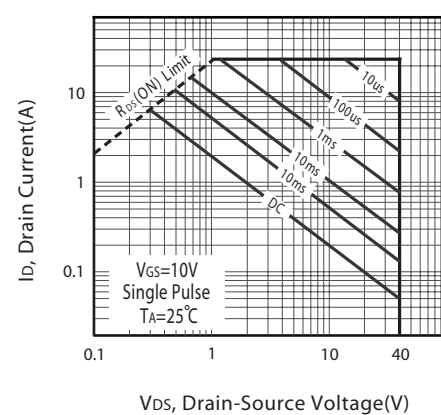
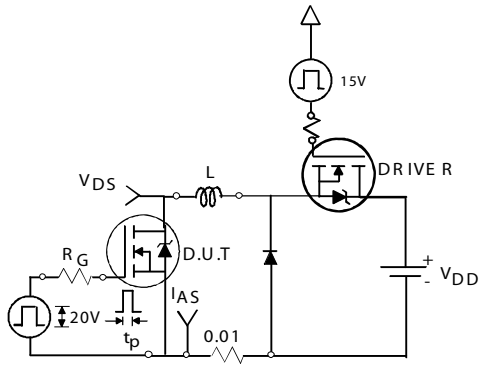
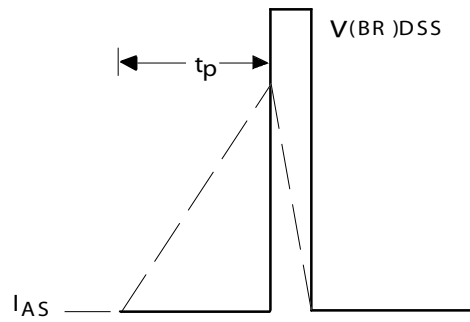


Figure 12. Maximum Safe Operating Area



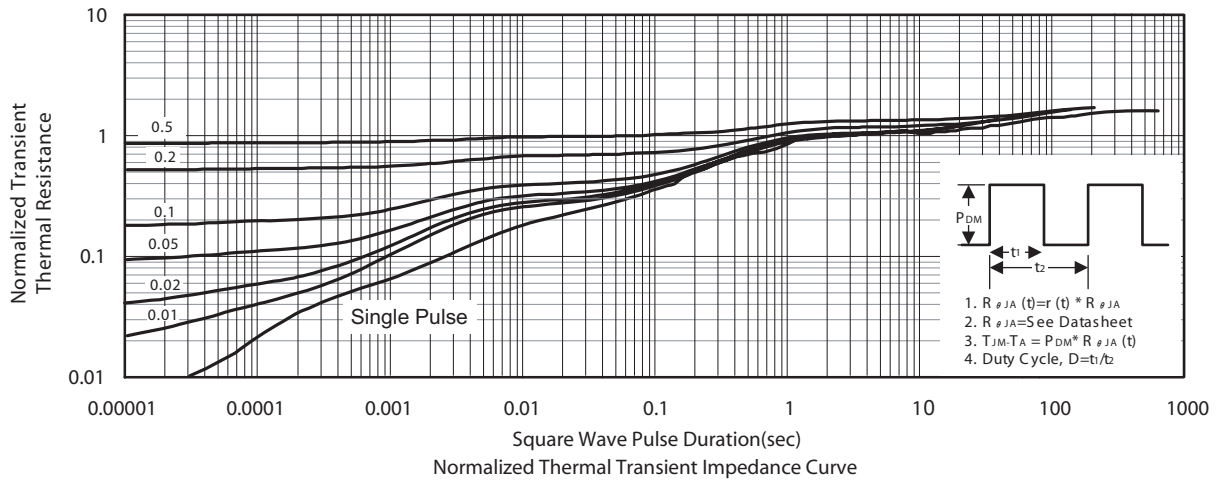
Unclamped Inductive Test Circuit

Figure 13a.



Unclamped Inductive Waveforms

Figure 13b.



## P-Channel

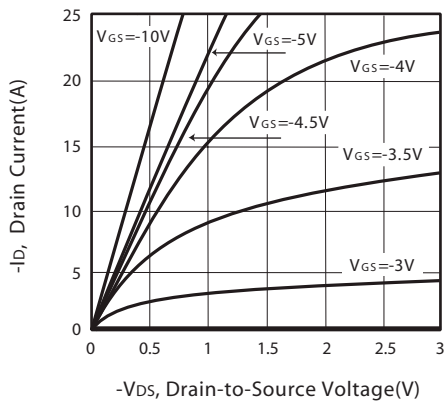


Figure 1. Output Characteristics

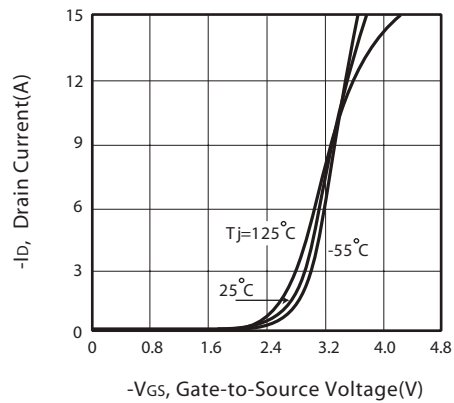


Figure 2. Transfer Characteristics

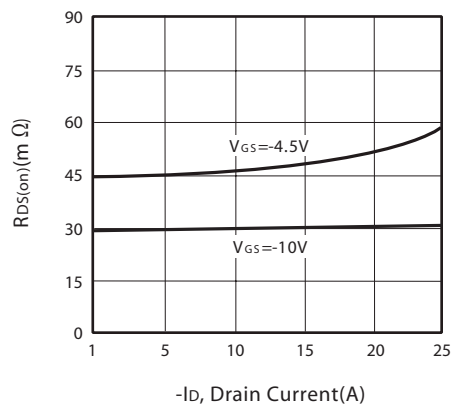


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

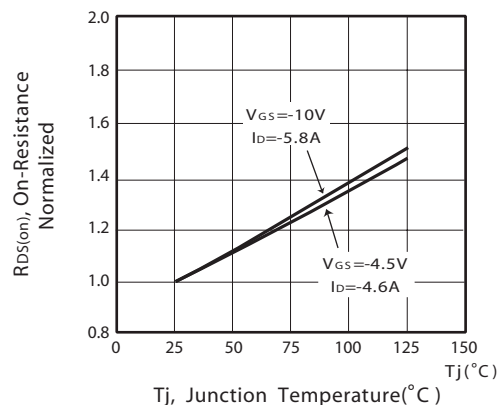


Figure 4. On-Resistance Variation with Drain Current and Temperature

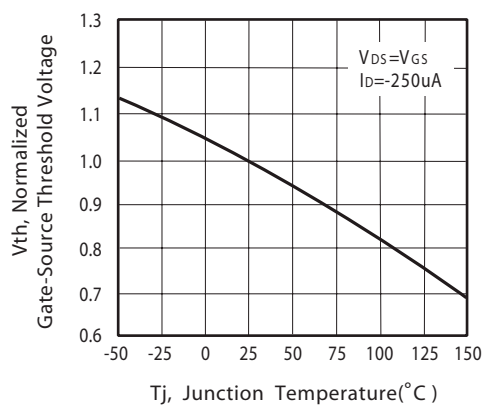


Figure 5. Gate Threshold Variation with Temperature

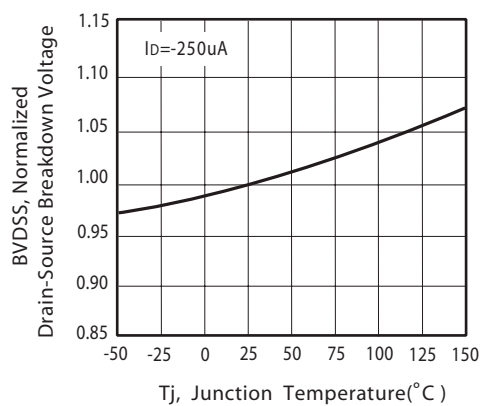


Figure 6. Breakdown Voltage Variation with Temperature

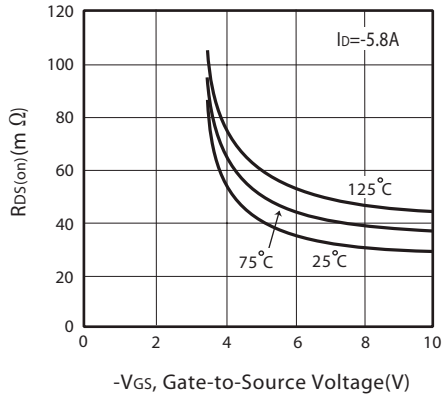


Figure 7. On-Resistance vs. Gate-Source Voltage

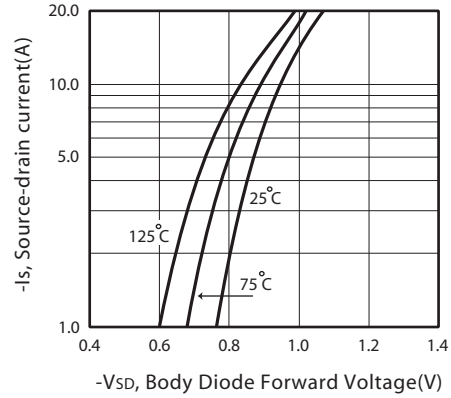


Figure 8. Body Diode Forward Voltage Variation with Source Current

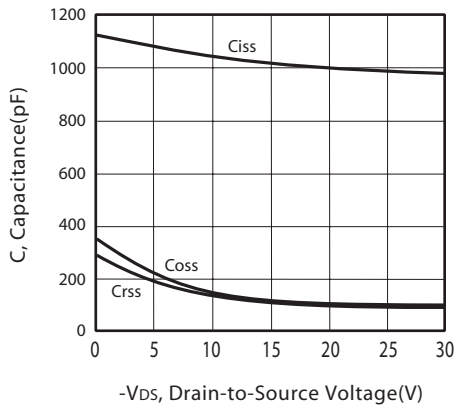


Figure 9. Capacitance

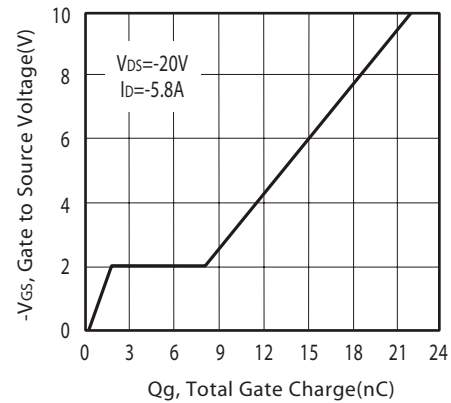


Figure 10. Gate Charge

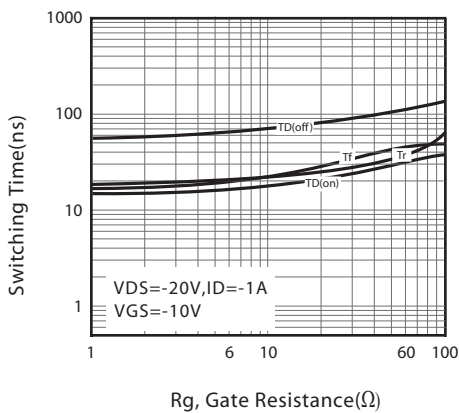


Figure 11. switching characteristics

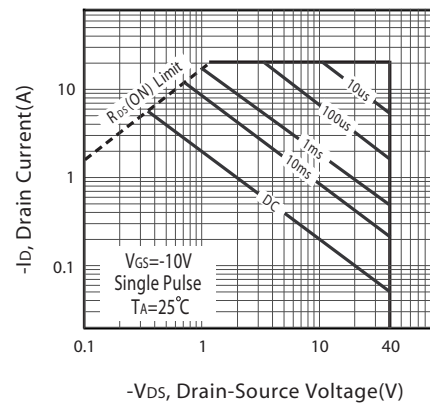
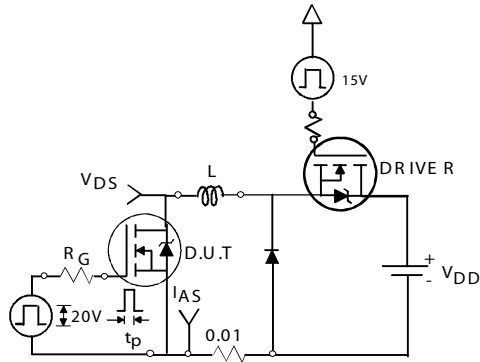


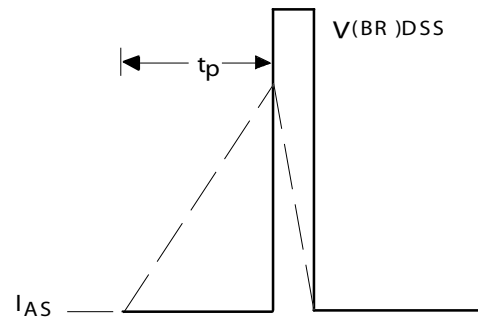
Figure 12. Maximum Safe Operating Area





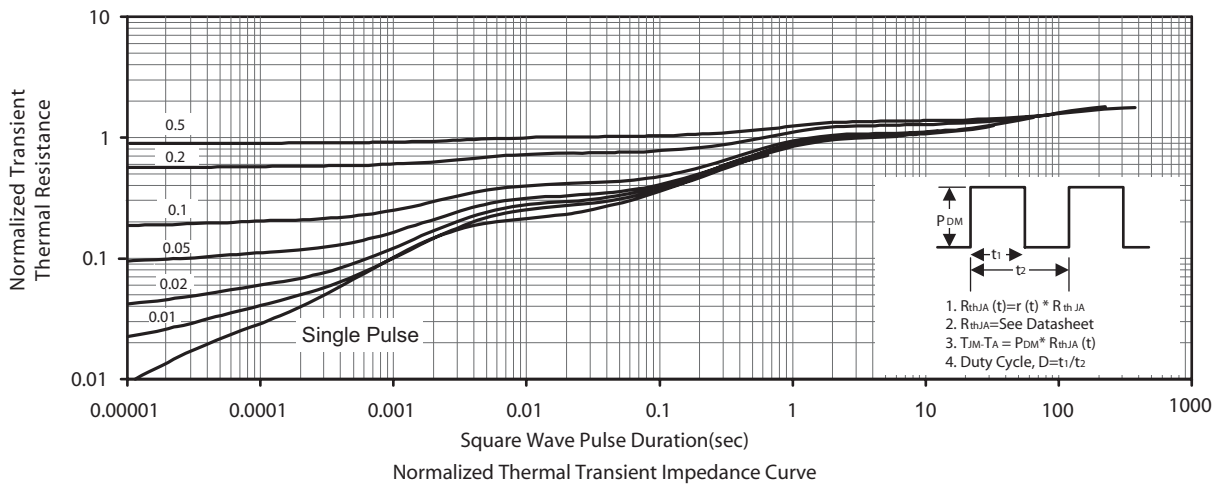
Unclamped Inductive Test Circuit

Figure 13a.



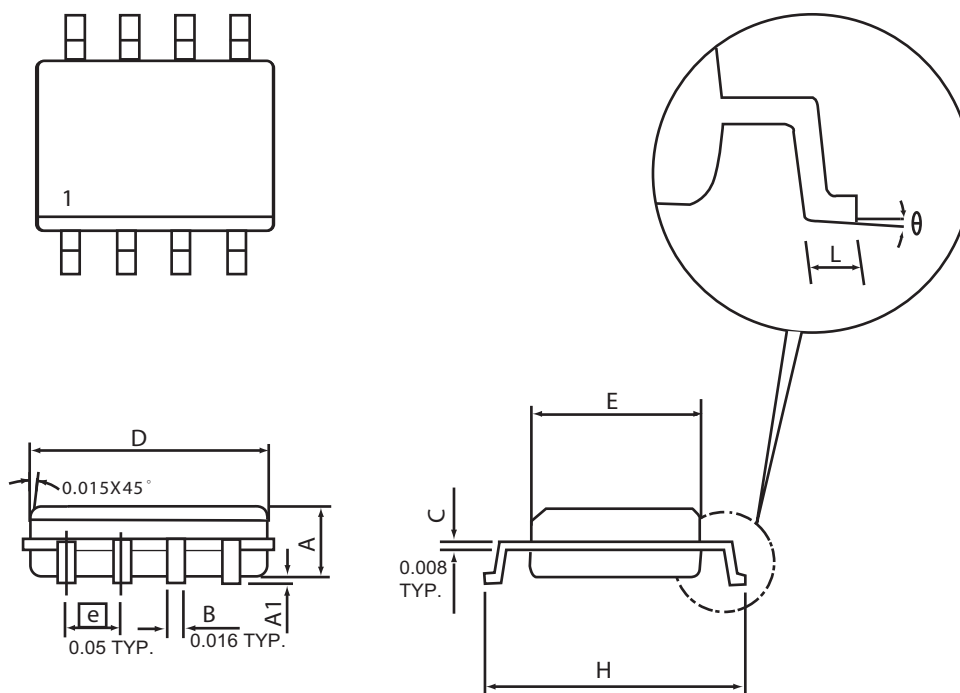
Unclamped Inductive Waveforms

Figure 13b.



## PACKAGE OUTLINE DIMENSIONS

### SO-8

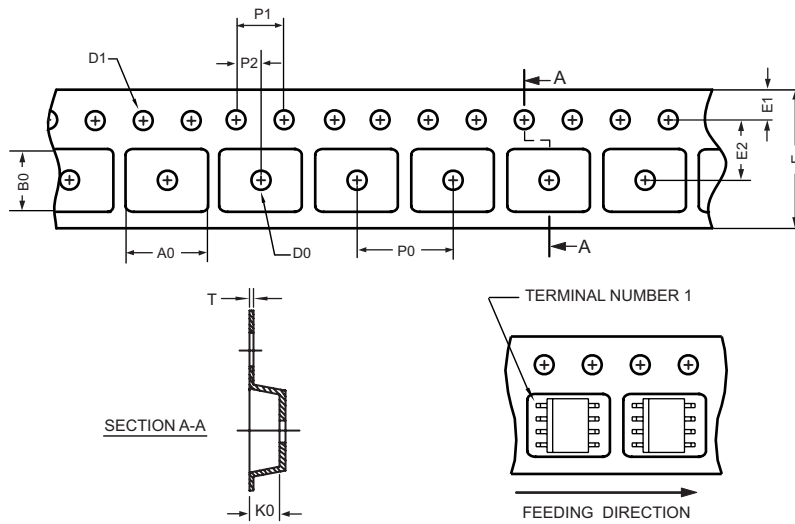


SYMBOLS	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	1.35	1.75	0.053	0.069
A1	0.10	0.25	0.004	0.010
D	4.80	4.98	0.189	0.196
E	3.81	3.99	0.150	0.157
H	5.79	6.20	0.228	0.244
L	0.41	1.27	0.016	0.050
θ	0°	8°	0°	8°

Notes : SO-8 package weight : 0.083g

## SO-8 Tape and Reel Data

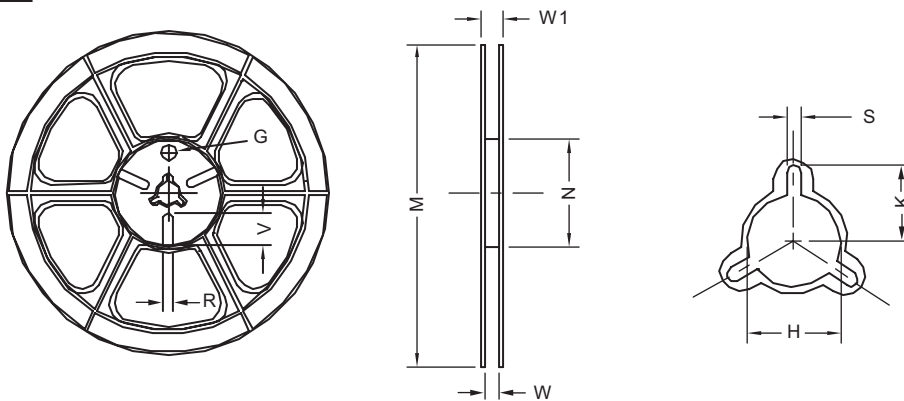
### SO-8 Carrier Tape



unit: mm

PACKAGE	A0	B0	K0	D0	D1	E	E1	E2	P0	P1	P2	T
SOP 8N 150mil	6.50 ±0.15	5.25 ±0.10	2.10 ±0.10	φ 1.5 (MIN)	φ 1.55 ±0.10	12.0 +0.3 - 0.1	1.75 ±0.10	5.5 ±0.10	8.0 ±0.10	4.0 ±0.10	2.0 ±0.10	0.30 ±0.013

### SO-8 Reel



UNIT: mm

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