



N-Channel Logic Level Enhancement Mode Field Effect Transistor

PRODUCT SUMMARY		
VDSS	ID	RDS(ON) (mΩ) Max
60V	10A	12.5 @ VGS=10V
		16 @ VGS=4.5V

FEATURES

- Super high dense cell design for low RDS(ON).
- Rugged and reliable.
- Surface Mount Package.



ABSOLUTE MAXIMUM RATINGS (TA=25°C unless otherwise noted)

Symbol	Parameter	Limit	Units
V _{DS}	Drain-Source Voltage	60	V
V _{GS}	Gate-Source Voltage	±20	V
I _D	Drain Current-Continuous ^c	T _C =25°C	10
		T _C =70°C	8
I _{DM}	-Pulsed ^{a,c}	50	A
E _{AS}	Single Pulse Avalanche Energy ^d	121	mJ
P _D	Maximum Power Dissipation	T _C =25°C	2.5
		T _C =70°C	1.6
T _J , T _{STG}	Operating Junction and Storage Temperature Range	-55 to 150	°C

THERMAL CHARACTERISTICS

R _{θJA}	Thermal Resistance, Junction-to-Ambient	50	°C/W
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STM6716

Ver 1.0

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

Symbol	Parameter	Conditions	Min	Typ	Max	Units
OFF CHARACTERISTICS						
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	60			V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=48V, V_{GS}=0V$			1	μA
I_{GSS}	Gate-Body Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$			± 100	nA
ON CHARACTERISTICS						
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	1	1.6	3	V
$R_{DS(ON)}$	Drain-Source On-State Resistance	$V_{GS}=10V, I_D=5A$		10	12.5	m ohm
		$V_{GS}=4.5V, I_D=4.5A$		12	16	m ohm
g_{FS}	Forward Transconductance	$V_{DS}=5V, I_D=5A$		26		S
DYNAMIC CHARACTERISTICS ^b						
C_{ISS}	Input Capacitance	$V_{DS}=25V, V_{GS}=0V$ $f=1.0\text{MHz}$		2578		pF
C_{OSS}	Output Capacitance			163		pF
C_{RSS}	Reverse Transfer Capacitance			128		pF
SWITCHING CHARACTERISTICS ^b						
$t_{D(ON)}$	Turn-On Delay Time	$V_{DD}=30V$ $I_D=1A$ $V_{GS}=10V$ $R_{GEN}=6\text{ ohm}$		39		ns
t_r	Rise Time			30		ns
$t_{D(OFF)}$	Turn-Off Delay Time			77		ns
t_f	Fall Time			32		ns
Q_g	Total Gate Charge	$V_{DS}=30V, I_D=5A, V_{GS}=10V$		31.6		nC
		$V_{DS}=30V, I_D=5A, V_{GS}=4.5V$		15		nC
Q_{gs}	Gate-Source Charge	$V_{DS}=30V, I_D=5A,$		3.4		nC
Q_{gd}	Gate-Drain Charge	$V_{GS}=10V$		7.4		nC
DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS						
V_{SD}	Diode Forward Voltage	$V_{GS}=0V, I_S=5A$		0.77	1.3	V

Notes

- Pulse Test: Pulse Width $\leq 10\mu s$, Duty Cycle $\leq 1\%$.
- Guaranteed by design, not subject to production testing.
- Drain current limited by maximum junction temperature.
- Starting $T_J=25^\circ\text{C}, L=0.5\text{mH}, V_{DD}=30V$. (See Figure 13)
- Mounted on FR4 Board of $1\text{ inch}^2, 2\text{oz}$.

Dec, 19, 2014

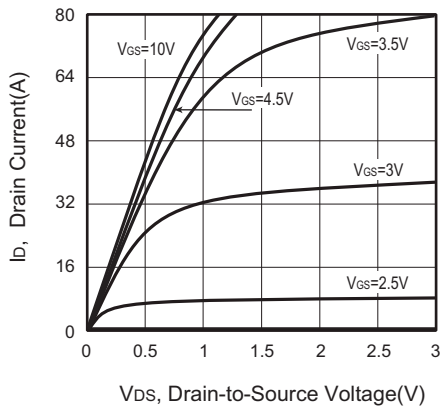


Figure 1. Output Characteristics

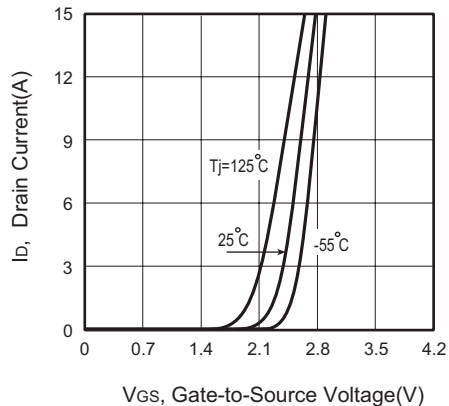


Figure 2. Transfer Characteristics

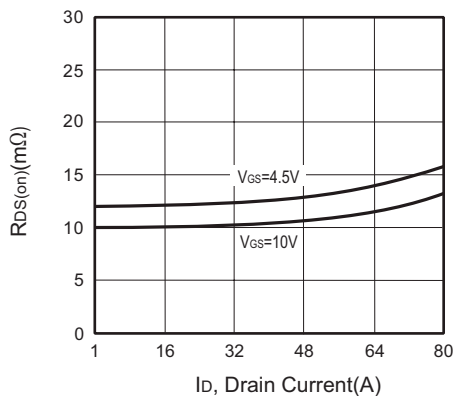


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

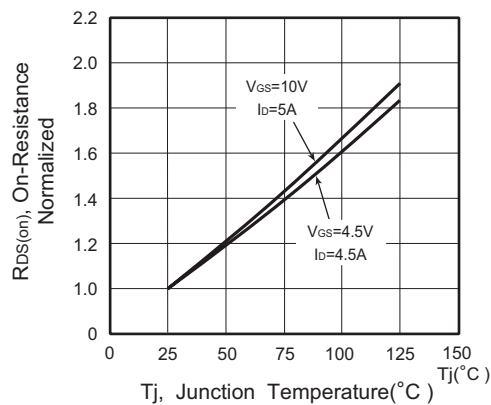


Figure 4. On-Resistance Variation with Drain Current and Temperature

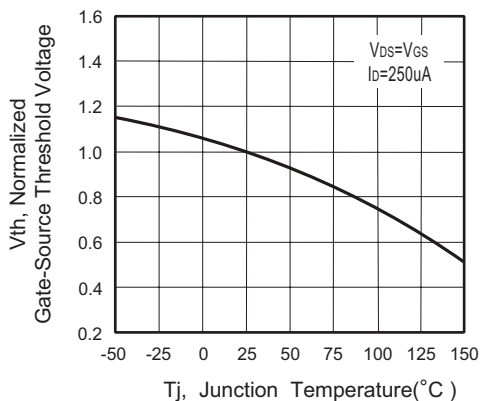


Figure 5. Gate Threshold Variation with Temperature

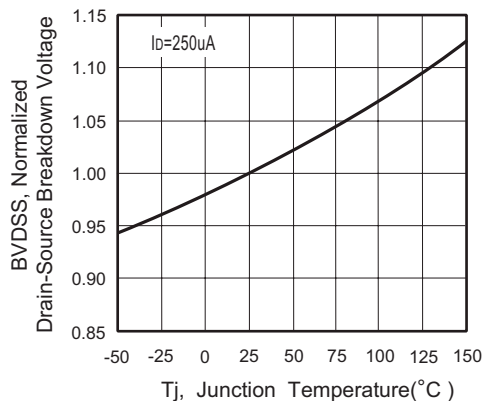


Figure 6. Breakdown Voltage Variation with Temperature

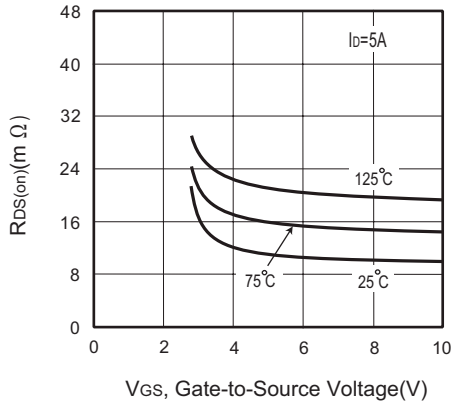


Figure 7. On-Resistance vs. Gate-Source Voltage

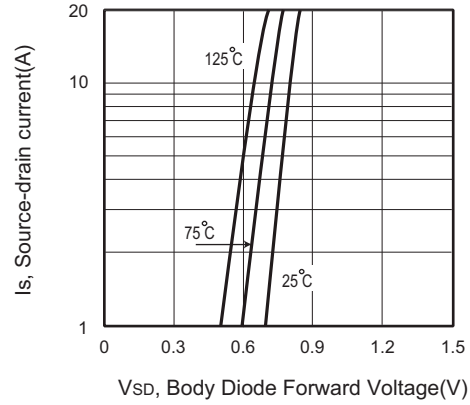


Figure 8. Body Diode Forward Voltage Variation with Source Current

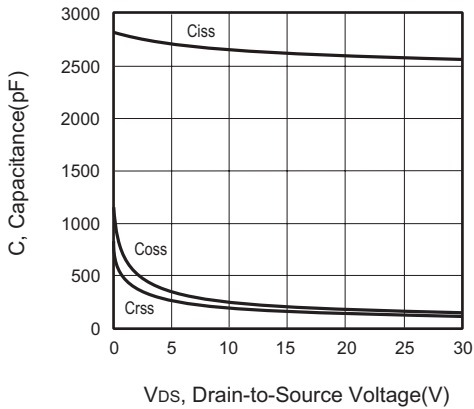


Figure 9. Capacitance

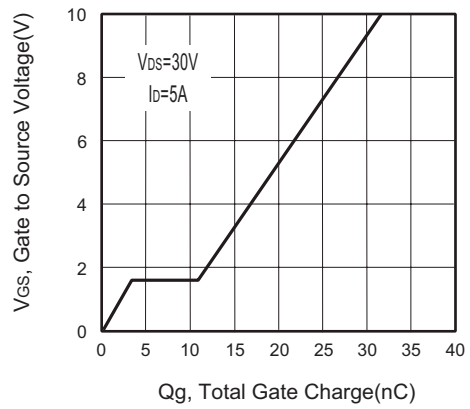


Figure 10. Gate Charge

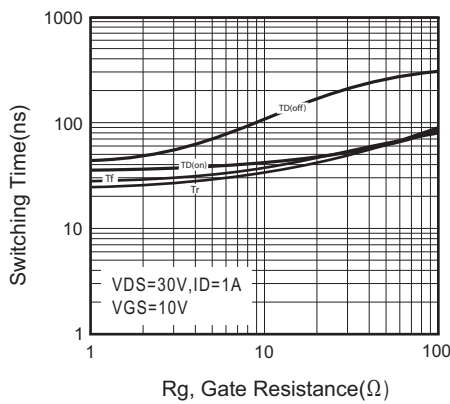


Figure 11. switching characteristics

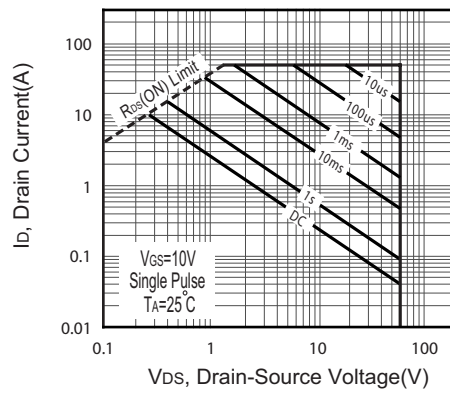
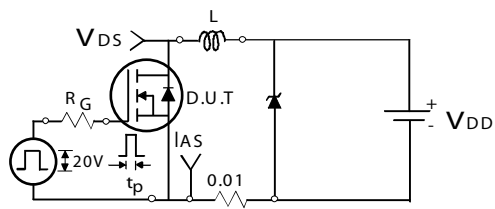
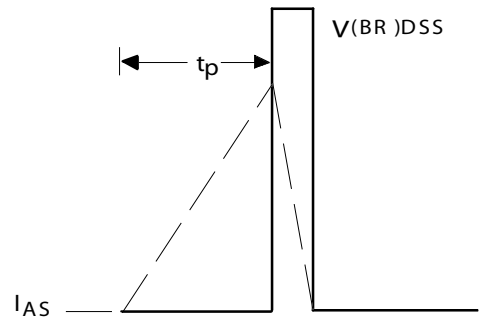


Figure 12. Maximum Safe Operating Area



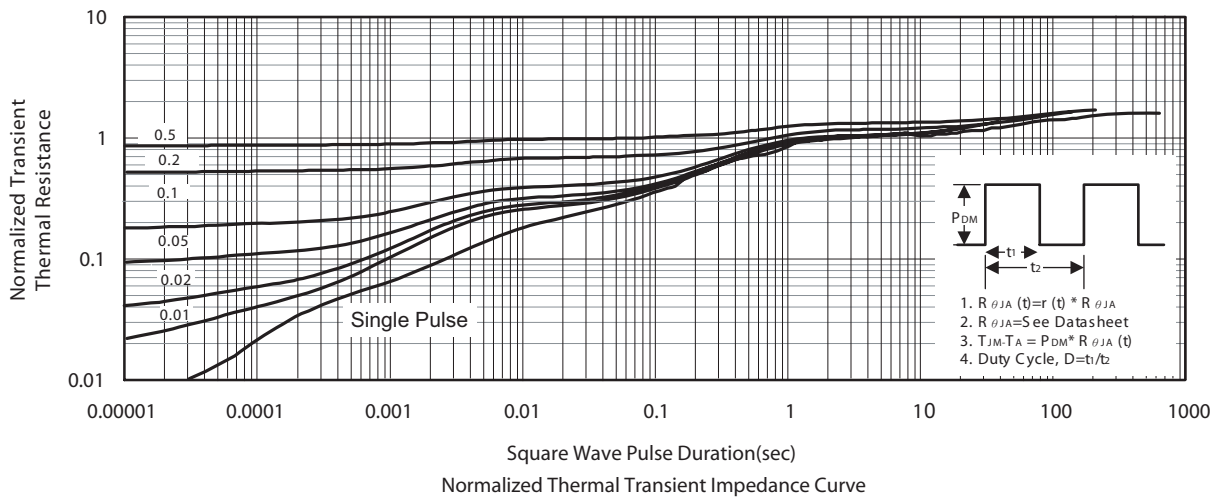
Unclamped Inductive Test Circuit

Figure 13a.



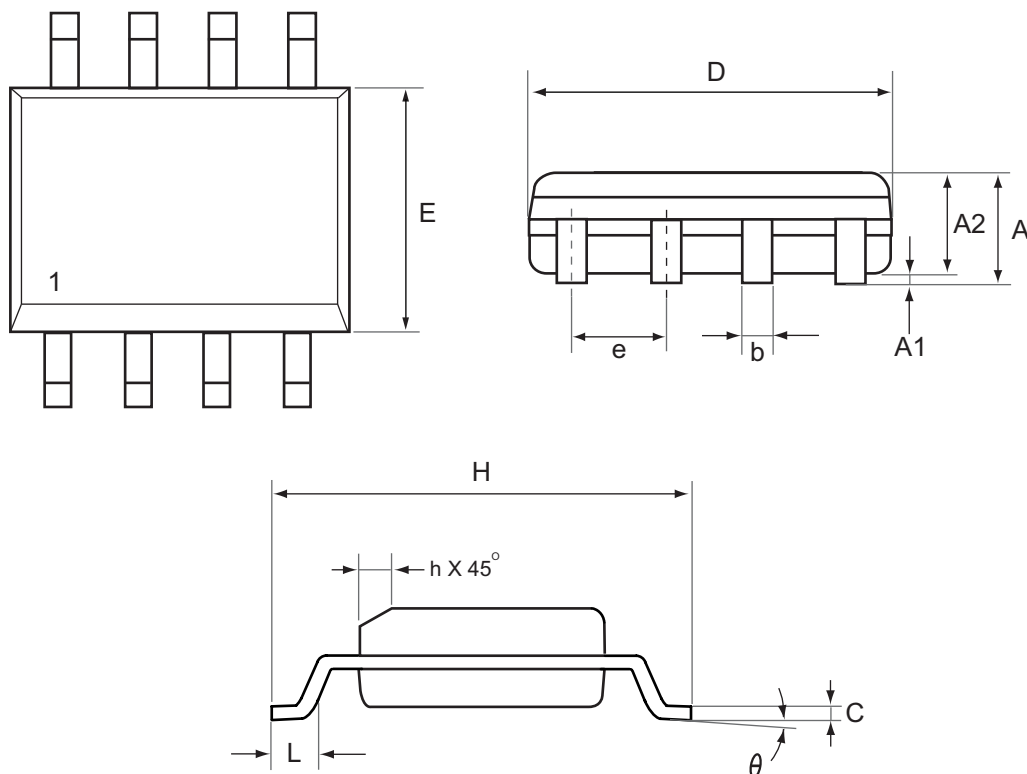
Unclamped Inductive Waveforms

Figure 13b.



PACKAGE OUTLINE DIMENSIONS

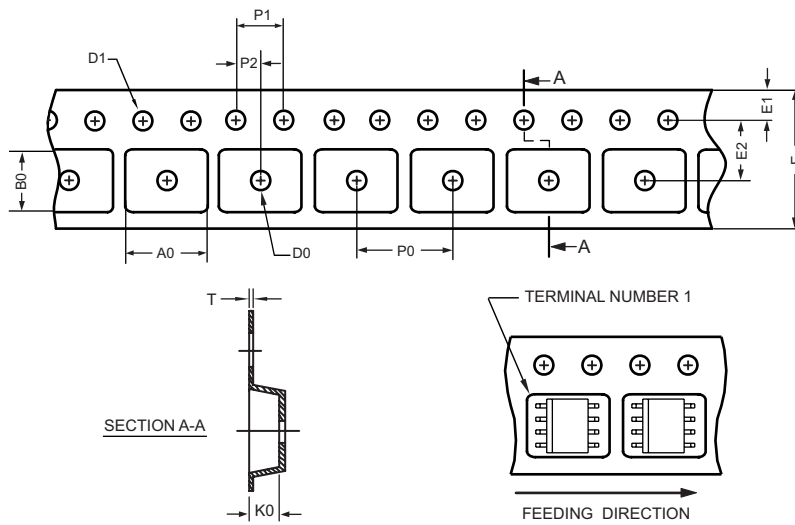
SO-8



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
A2	1.25	1.63	0.049	0.064
b	0.31	0.51	0.012	0.020
C	0.17	0.25	0.007	0.010
D	4.80	5.00	0.189	0.197
E	3.70	4.00	0.146	0.157
e	1.27 REF.		0.050 BSC	
H	5.80	6.20	0.228	0.244
L	0.40	1.27	0.016	0.050
θ	0°	8°	0°	8°
h	0.25	0.50	0.010	0.020

SO-8 Tape and Reel Data

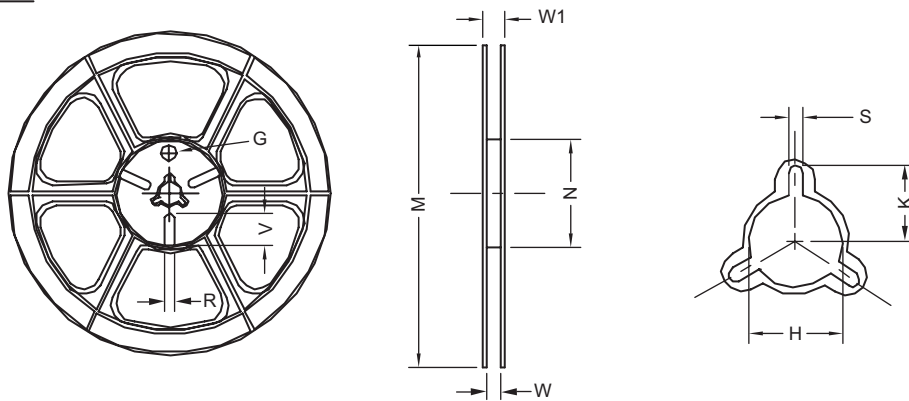
SO-8 Carrier Tape



unit: mm

PACKAGE	A0	B0	K0	D0	D1	E	E1	E2	P0	P1	P2	T
SOP 8N	6.50	5.25	2.10	φ.5	φ.55	12.0	1.75	5.5	8.0	4.0	2.0	0.30
150mil	±0.15	±0.10	±0.10	(MIN)	±0.10	+0.3 -0.1	±0.10	±0.10	±0.10	±0.10	±0.10	±0.013

SO-8 Reel



UNIT: mm

TAPE SIZE	REEL SIZE	M	N	W	W1	H	K	S	G	R	V
12 mm	φ30	330 ± 1	62 ±1.5	12.4 + 0.2	16.8 - 0.4	φ2.75 + 0.15	---	2.0 ±0.15	---	---	---

TOP MARKING DEFINITION

