

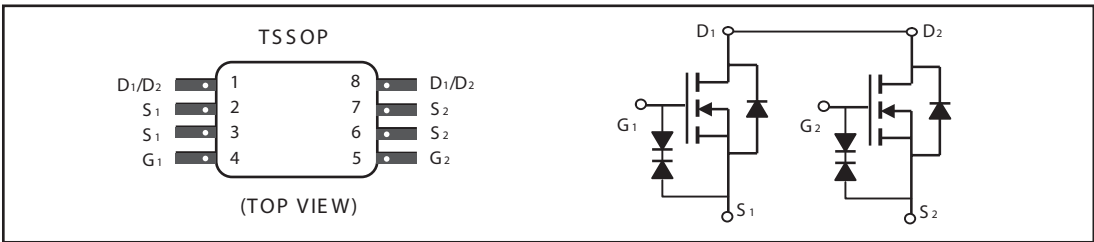


Dual N-Channel Enhancement Mode Field Effect Transistor

PRODUCT SUMMARY		
V _{DSS}	I _D	R _{DS(ON)} (mΩ) Max
20V	10A	13.5 @ V _{GS} = 4.0V 18 @ V _{GS} = 2.5V

FEATURES

- Super high dense cell design for low R_{DS(ON)}.
- Rugged and reliable.
- Surface Mount Package.
- ESD Protected.



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

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V _{DS}	20	V
Gate-Source Voltage	V _{GS}	±12	V
Drain Current-Continuous ^a @ T _J =25°C -Pulsed ^b	I _D	10	A
	I _{DM}	40	A
Drain-Source Diode Forward Current ^a	I _S	1.7	A
Maximum Power Dissipation ^a	P _D	1.5	W
Operating Junction and Storage Temperature Range	T _J , T _{STG}	-55 to 150	°C

THERMAL CHARACTERISTICS

Thermal Resistance, Junction-to-Ambient ^a	R _{θJA}	85	°C/W
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STG8211

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ ^c	Max	Unit
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} = 0V, I _D = 250uA	20			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 16V, V _{GS} = 0V			1	uA
Gate-Body Leakage	I _{GSS}	V _{GS} = ±12V, V _{DS} = 0V			±10	uA
ON CHARACTERISTICS ^b						
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250uA	0.5	0.8	1.5	V
Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} = 4V, I _D = 5A		11	13.5	m ohm
		V _{GS} = 2.5V, I _D = 3A		13.5	18	m ohm
Forward Transconductance	g _{FS}	V _{DS} = 5V, I _D = 5A		22		S
DYNAMIC CHARACTERISTICS ^c						
Input Capacitance	C _{ISS}	V _{DS} = 8V, V _{GS} = 0V f = 1.0MHz		1815		pF
Output Capacitance	C _{OSS}			406		pF
Reverse Transfer Capacitance	C _{RSS}			255		pF
SWITCHING CHARACTERISTICS ^c						
Turn-On Delay Time	t _{D(ON)}	V _{DD} = 10V, I _D = 1A, V _{GEN} = 4V, R _L = 10 ohm R _{GEN} = 10 ohm		31		ns
Rise Time	t _r			62		ns
Turn-Off Delay Time	t _{D(OFF)}			96		ns
Fall Time	t _f			40		ns
Total Gate Charge	Q _g	V _{DS} = 10V, I _D = 5A, V _{GS} = 4V		19		nC
Gate-Source Charge	Q _{gs}			3.5		nC
Gate-Drain Charge	Q _{gd}			6.7		nC

STG8211

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

Parameter	Symbol	Condition	Min	Typ ^c	Max	Unit
DRAIN-SOURCE DIODE CHARACTERISTICS^b						
Diode Forward Voltage	V_{SD}	$V_{GS} = 0V, I_s = 1.7A$		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.

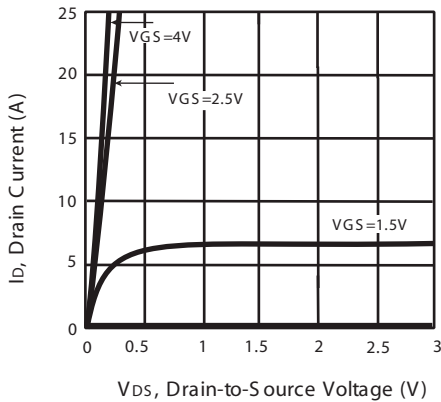


Figure 1. Output Characteristics

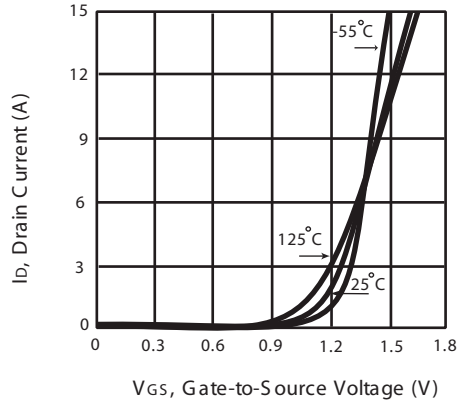


Figure 2. Transfer Characteristics

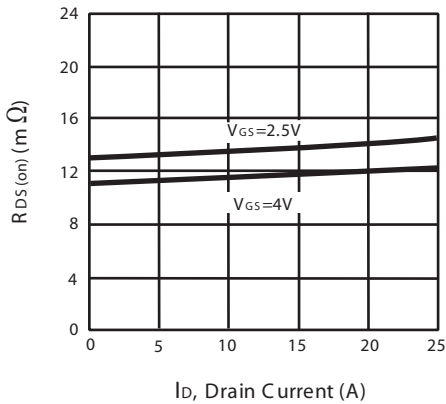


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

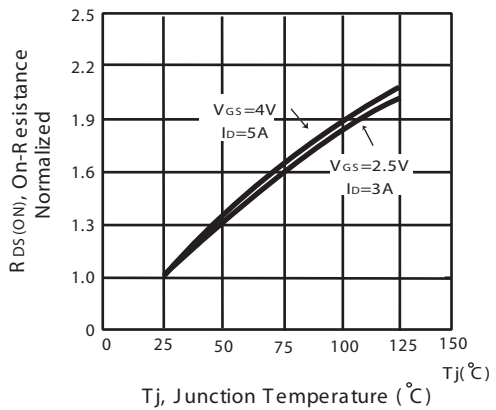


Figure 4. On-Resistance Variation with Drain Current and Temperature

STG8211

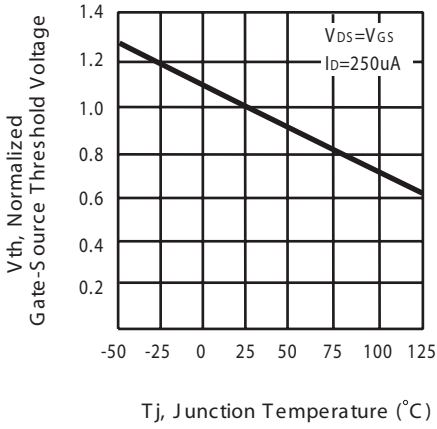


Figure 5. Gate Threshold Variation with Temperature

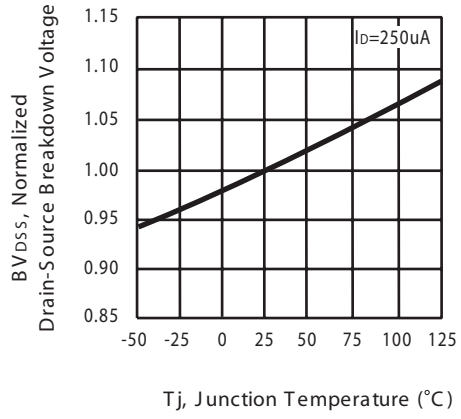


Figure 6. Breakdown Voltage Variation with Temperature

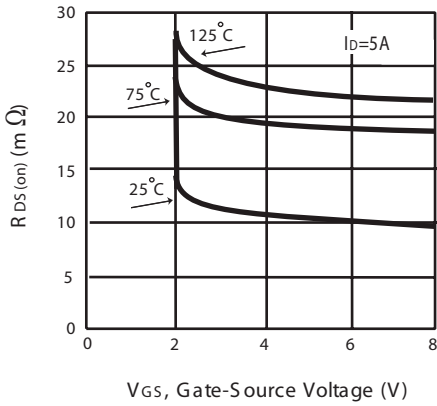


Figure 7. On-Resistance vs. Gate-Source Voltage

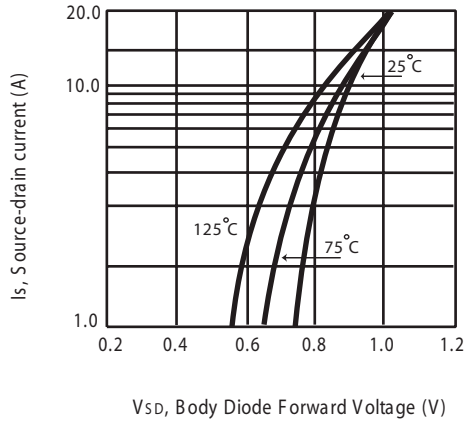


Figure 8. Body Diode Forward Voltage Variation with Source Current

STG8211

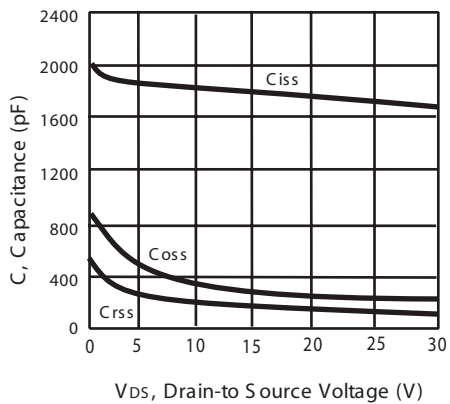


Figure 9. Capacitance

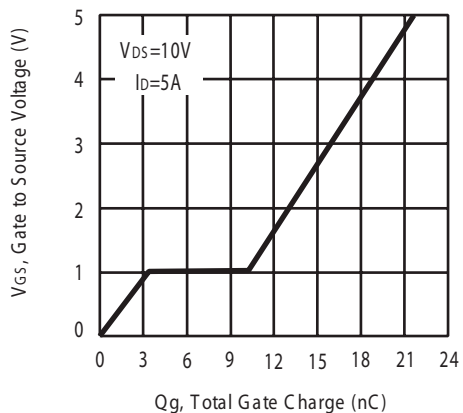


Figure 10. Gate Charge

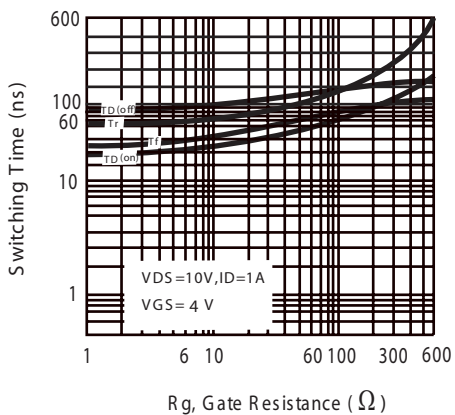


Figure 11. switching characteristics

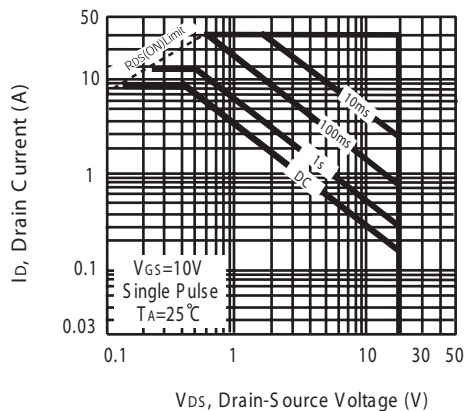


Figure 12. Maximum Safe Operating Area

STG8211

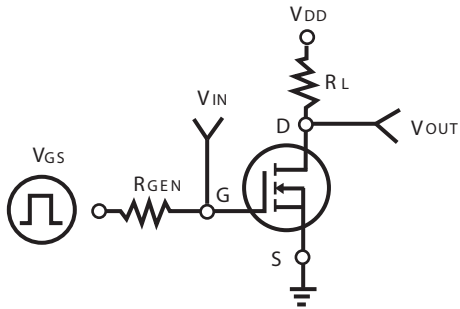


Figure 13. Switching Test Circuit

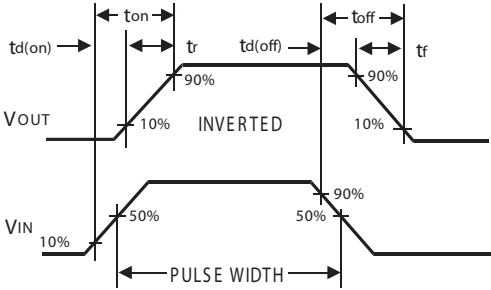


Figure 14. Switching Waveforms

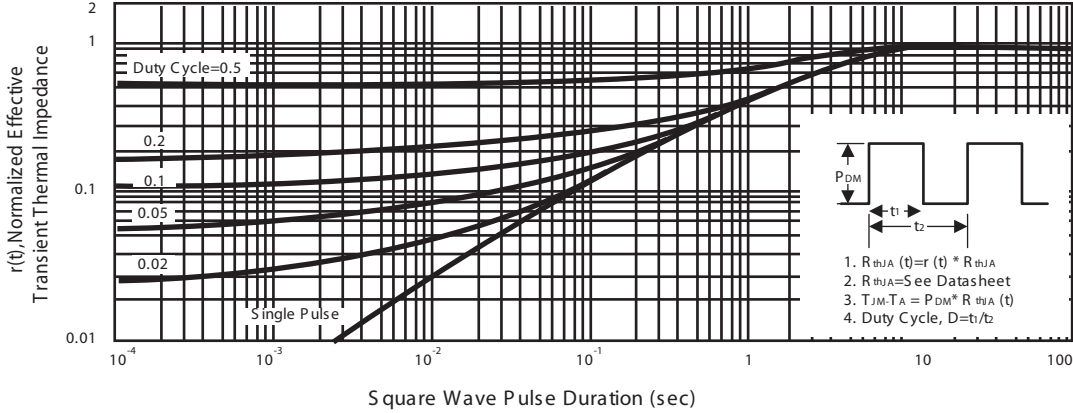
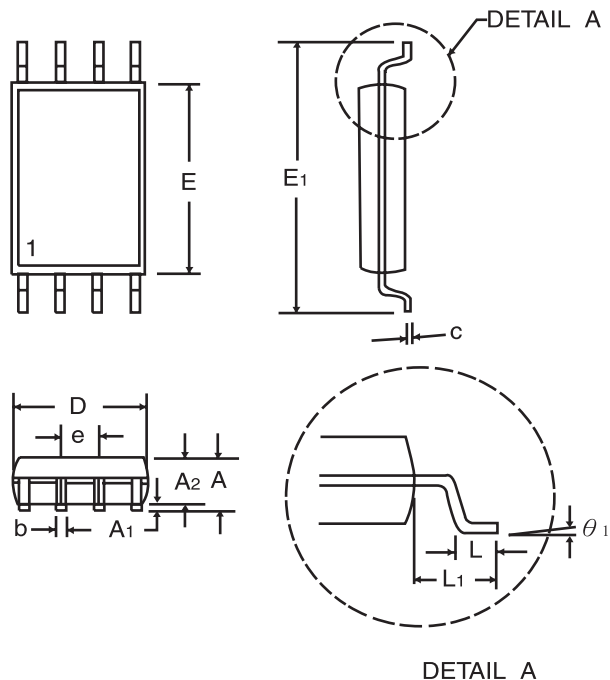


Figure 15. Normalized Thermal Transient Impedance Curve

STG8211

PACKAGE OUTLINE DIMENSIONS

TSSOP-8



SYMBOLS	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	0.85	1.20	0.033	0.047
A1	0.05	0.15	0.002	0.006
A2	0.80	1.05	0.031	0.041
b	0.19	0.30	0.007	0.012
c	0.127		0.005	
D	2.90	3.10 ^②	0.114	0.122 ^②
E	4.30	4.50 ^③	0.169	0.177 ^③
E1	6.20	6.60	0.244	0.260
e	0.65BSC		0.025BSC	
L	0.50	0.70	0.020	0.028
L1	1.00		0.039	
θ_1	0°	8°	0°	8°

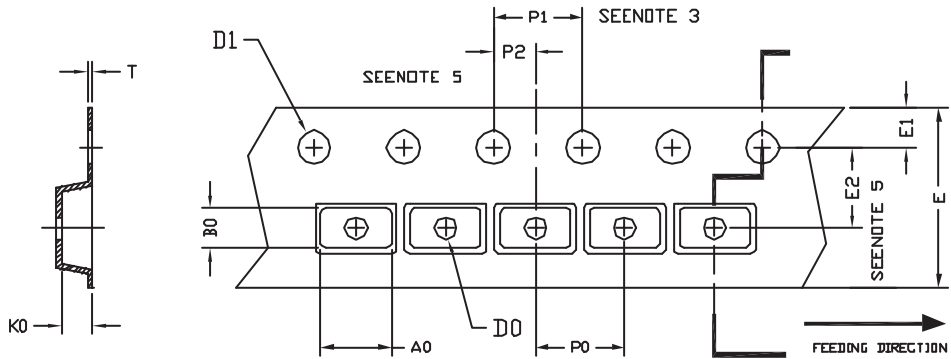
Notes:

1. This drawing is for general information only.
Refer to JEDEC Drawing MO-153, Variation AA, for proper dimensions, tolerances, datums, etc.
2. Dimension D does not include mold Flash, protrusions or gate burrs.
Mold Flash, protrusions and gate burrs shall not exceed 0.15 mm (0.006 in) per side.
3. Dimension E does not include inter-lead Flash or protrusions.
Inter-lead Flash and protrusions shall not exceed 0.25mm (0.010 in) per side.
4. Dimension b does not include Dambar protrusion. Allowable Dambar protrusion shall be 0.08 mm total in excess of the b dimension at maximum material condition. Dambar cannot be located on the lower radius of the foot. Minimum space between protrusion and adjacent lead is 0.07 mm.
5. Dimension D and E to be determined at Datum Plane H.

STG8211

TSSOP-8 Tape and Reel Data

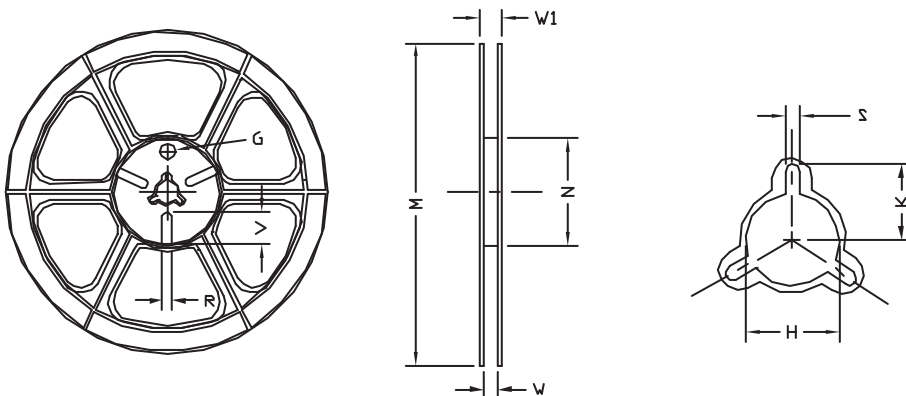
TSSOP-8 Carrier Tape



UNIT : mm

PACKAGE	A0	B0	K0	D0	D1	E	E1	E2	P0	P1	P2	T
TSSOP 8	6.08	4.40	1.60	$\phi 1.50$ + 0.1 - 0.0	$\phi 1.50$ + 0.1 - 0.0	12.00 ± 0.3	1.75	5.50 ± 0.05	8.00	4.00	2.00 ± 0.05	0.30 ± 0.05

TSSOP-8 Reel



UNIT : mm

TAPE SIZE	REEL SIZE	M	N	W	W1	H	K	S	G	R	V
12 mm	$\phi 330$	330	100	12.5	16.0	$\phi 13.0$ + 0.5 - 0.2	10.6	2.0 ± 0.5	---	---	---