



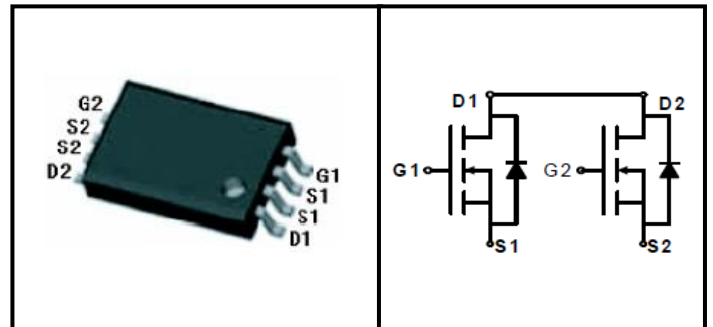
20V N-Channel Trench MOSFET

FEATURES

- Trench Power MOSFET Technology
- Low $R_{DS(ON)}$
- Low Gate Charge
- Optimized For Fast-switching Applications

APPLICATIONS

- Synchronous Rectification in DC/DC and AC/DC Converters
- Isolated DC/DC Converters in Telecom and Industrial



Device Marking and Package Information		
Device	Package	Marking
TTK8205	TSSOP-8	8205

Absolute Maximum Ratings $T_C = 25^\circ\text{C}$, unless otherwise noted			
Parameter	Symbol	Value	Unit
		TSSOP-8	
Drain-Source Voltage ($V_{GS} = 0\text{V}$)	V_{DSS}	20	V
Continuous Drain Current	I_D	6	A
Pulsed Drain Current (note1)	I_{DM}	24	A
Gate-Source Voltage	V_{GSS}	± 10	V
Single Pulse Avalanche Energy (note2)	E_{AS}	7.4	mJ
Avalanche Current	I_{AS}	7	A
Power Dissipation ($T_C = 25^\circ\text{C}$)	P_D	1.5	W
Operating Junction and Storage Temperature Range	T_J, T_{stg}	-55~+150	$^\circ\text{C}$

Thermal Resistance			
Parameter	Symbol	Value	Unit
		TSSOP-8	
Thermal Resistance, Junction-to-Case	R_{thJC}	14.4	K/W
Thermal Resistance, Junction-to-Ambient	R_{thJA}	83	



Specifications $T_J = 25^{\circ}\text{C}$, unless otherwise noted						
Parameter	Symbol	Test Conditions	Value			Unit
			Min.	Typ.	Max.	
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 250\mu\text{A}$	20	--	--	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 20V, V_{GS} = 0V, T_J = 25^{\circ}\text{C}$	--	--	1	μA
		$V_{DS} = 20V, V_{GS} = 0V, T_J = 150^{\circ}\text{C}$	--	--	100	
Gate-Source Leakage	I_{GSS}	$V_{GS} = \pm 10V$	--	--	± 100	nA
Gate-Source Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu\text{A}$	0.5	0.7	1.2	V
Drain-Source On-Resistance (Note3)	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 3A$	--	16	20.5	$\text{m}\Omega$
		$V_{GS} = 4.5V, I_D = 3A$	--	19	25	$\text{m}\Omega$
		$V_{GS} = 2.5V, I_D = 3A$	--	24	31.5	$\text{m}\Omega$
Forward Transconductance (Note3)	g_{fs}	$V_{DS} = 5V, I_D = 3A$	--	8	--	S
Dynamic						
Input Capacitance	C_{iss}	$V_{GS} = 0V,$ $V_{DS} = 10V,$ $f = 1.0\text{MHz}$	--	408	--	pF
Output Capacitance	C_{oss}		--	67	--	
Reverse Transfer Capacitance	C_{rss}		--	24	--	
Total Gate Charge	$Q_g (10V)$	$V_{DD} = 10V, I_D = 6A,$ $V_{GS} = 10V$	--	12	--	nC
	$Q_g (4.5V)$		--	5.8	--	
Gate-Source Charge	Q_{gs}		--	0.7	--	
Gate-Drain Charge	Q_{gd}		--	1.8	--	
Turn-on Delay Time	$t_{d(on)}$		$V_{DD} = 10V, I_D = 6A,$ $R_G = 2.5\Omega$	--	15	
Turn-on Rise Time	t_r	--		17	--	
Turn-off Delay Time	$t_{d(off)}$	--		42	--	
Turn-off Fall Time	t_f	--		40	--	
Drain-Source Body Diode Characteristics						
Continuous Body Diode Current	I_S	$T_C = 25^{\circ}\text{C}$	--	--	6	A
Pulsed Diode Forward Current	I_{SM}		--	--	24	
Body Diode Voltage	V_{SD}	$T_J = 25^{\circ}\text{C}, I_{SD} = 6A, V_{GS} = 0V$	--	--	1.2	V

Notes

1. Repetitive Rating: Pulse Width limited by maximum junction temperature
2. $V_{DD} = 20V, R_G = 25\Omega$, Starting $T_J = 25^{\circ}\text{C}$
3. Pulse Test: Pulse Width $\leq 300\mu\text{s}$, Duty Cycle $\leq 1\%$



Typical Characteristics $T_J = 25^\circ\text{C}$, unless otherwise noted

Figure 1. Output Characteristics

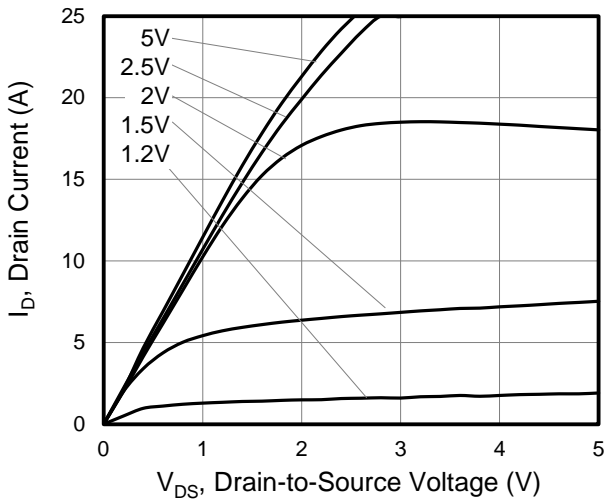


Figure 2. Transfer Characteristics

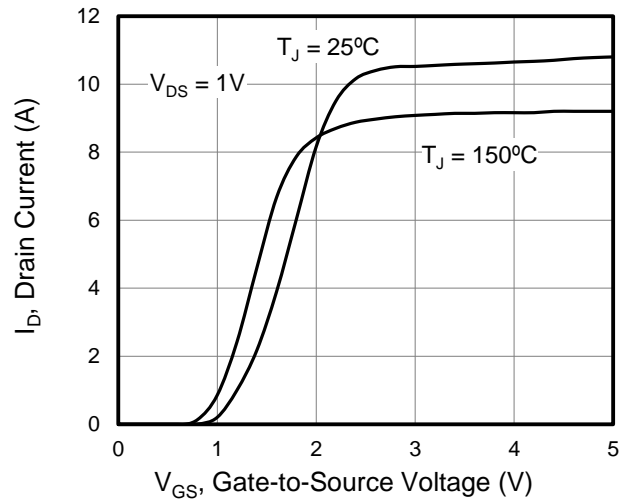


Figure 3. On-Resistance vs. Drain Current

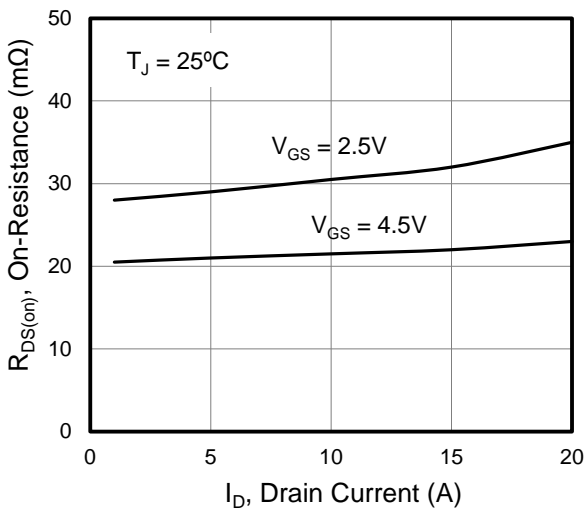


Figure 4. Capacitance

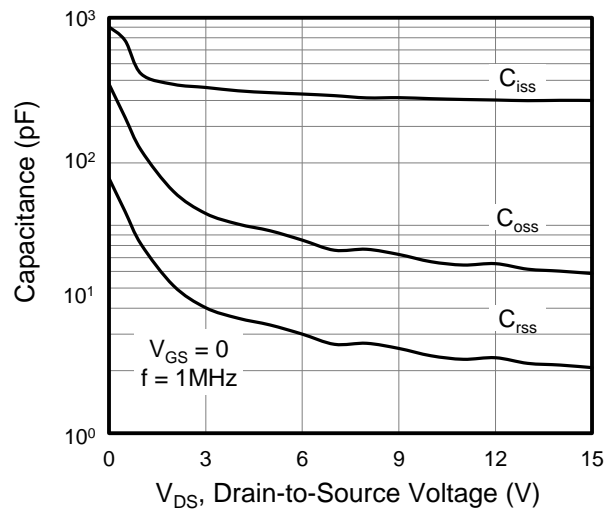


Figure 5. Gate Charge

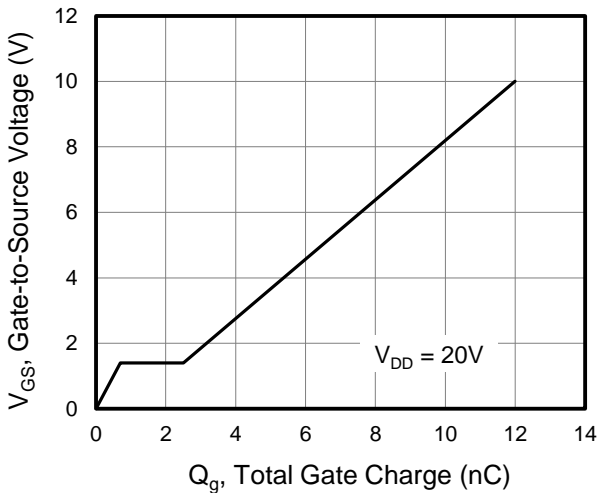
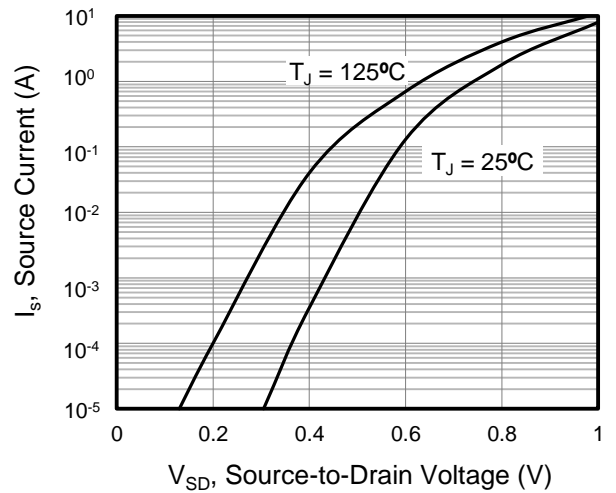


Figure 6. Body Diode Forward Voltage





Typical Characteristics $T_J = 25^\circ\text{C}$, unless otherwise noted

Figure 7. On-Resistance vs. Junction Temperature

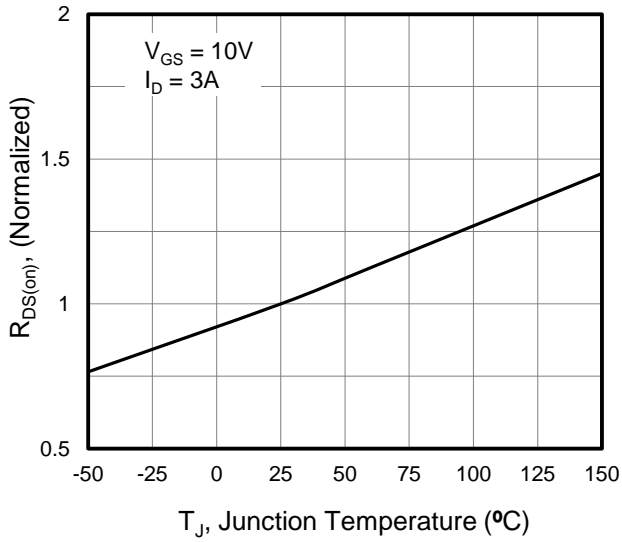


Figure 8. Threshold Voltage vs. Junction Temperature

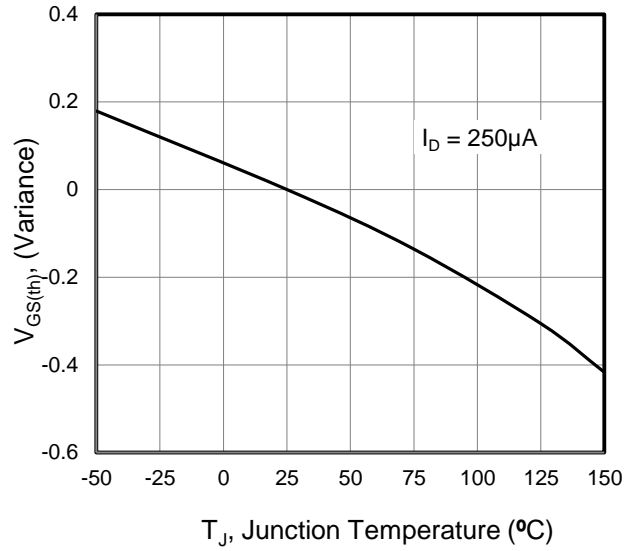


Figure 9. Transient Thermal Impedance

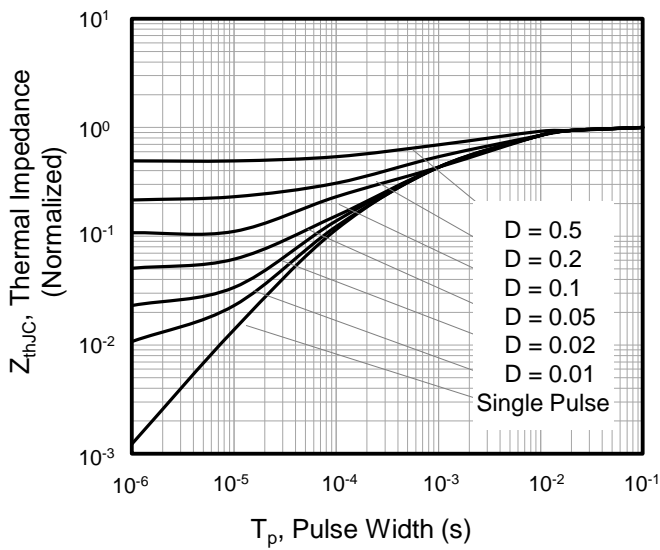




Figure A: Gate Charge Test Circuit and Waveform



Figure B: Resistive Switching Test Circuit and Waveform

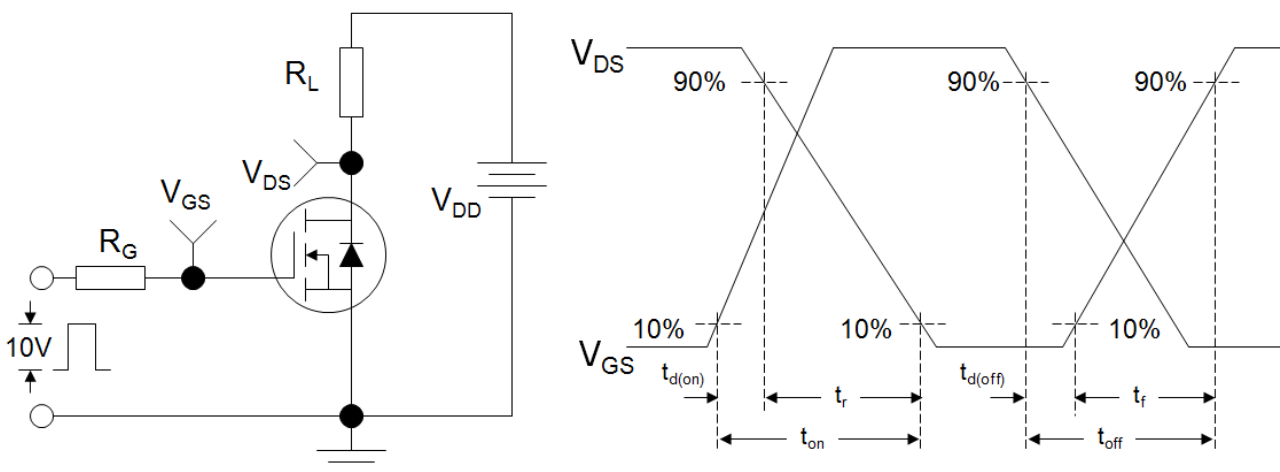
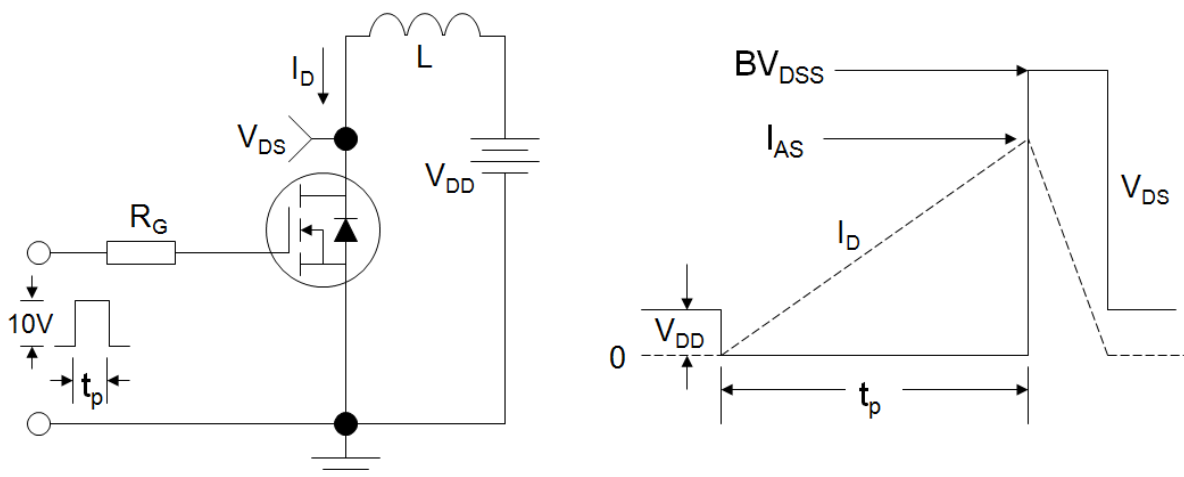
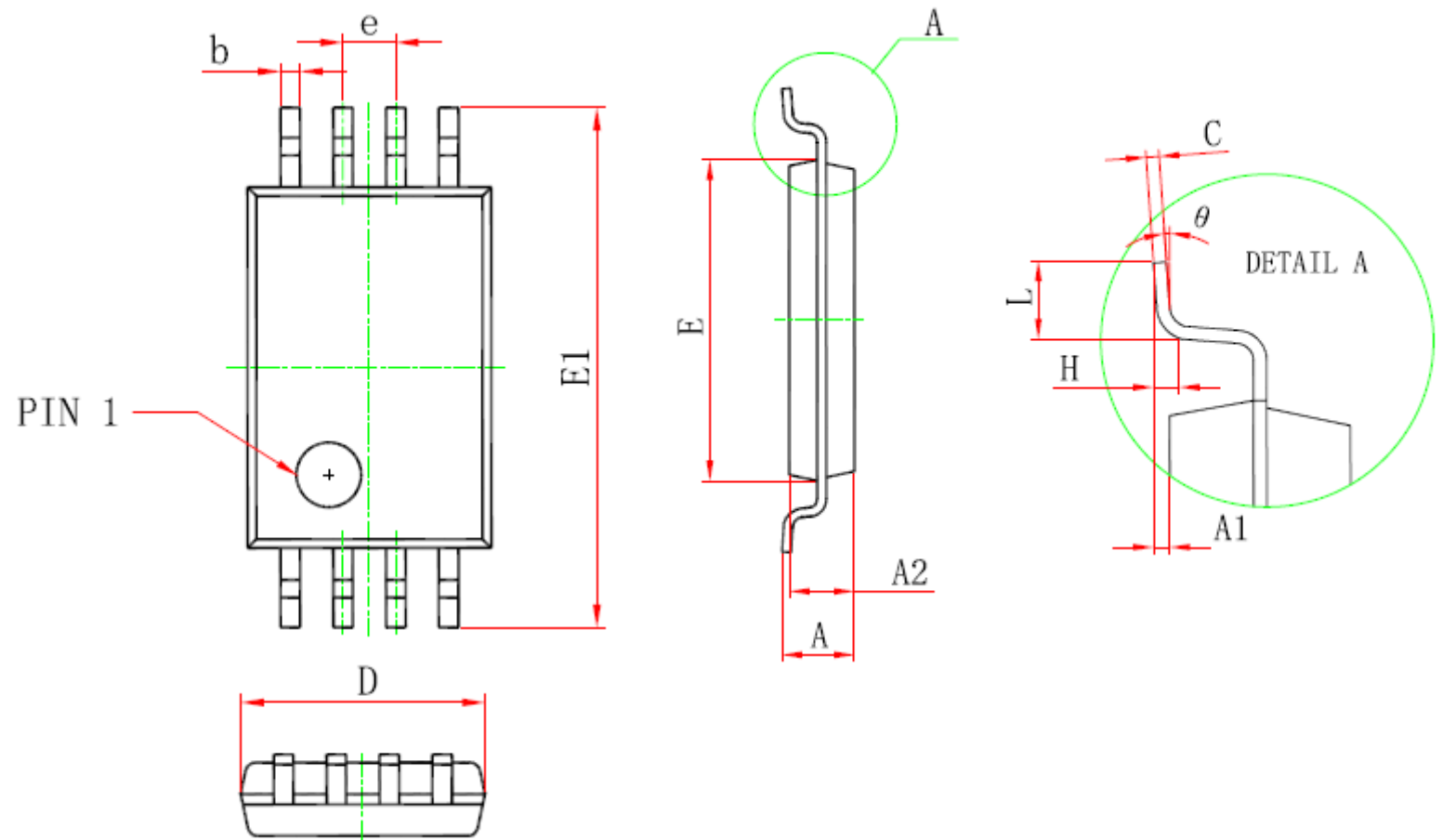


Figure C: Unclamped Inductive Switching Test Circuit and Waveform





TSSOP-8



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
D	2.900	3.100	0.114	0.122
E	4.300	4.500	0.169	0.177
b	0.190	0.300	0.007	0.012
c	0.090	0.200	0.004	0.008
E1	6.250	6.550	0.246	0.258
A		1.200		0.047
A2	0.800	1.000	0.031	0.039
A1	0.050	0.150	0.002	0.006
e	0.65 (BSC)		0.026 (BSC)	
L	0.500	0.700	0.020	0.028
H	0.25 (TYP)		0.01 (TYP)	
θ	1°	7°	1°	7°



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