

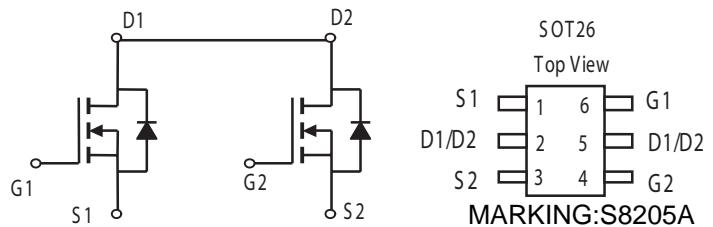
FEATURES

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

S8205
N-Channel MOSFET



PRODUCT SUMMARY		
V _{DSS}	I _D	R _{DS(ON)} (m ohm)Max
20V	5A	25@V _{GS} = 4.5 V 40@V _{GS} = 2.5 V



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 @ T _J =25°C -Pulsed ^b	I _D	5	A
	I _{DM}	25	A
Drain-Source Diode Forward Current ^a	I _S	2	A
Maximum Power Dissipation ^a	P _D	1.25	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}	100	°C/W
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S8205 Typical Characteristics

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

Parameter	Symbol	Condition	Min	Typ ^c	Max	Unit
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS} = 0V, I_D = 250\mu A$	20			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 16V, V_{GS} = 0V$			1	μA
Gate-Body Leakage	I_{GSS}	$V_{GS} = \pm 12V, V_{DS} = 0V$			± 100	nA
ON CHARACTERISTICS^b						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	0.5	0.8	1.0	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS} = 4.0V, I_D = 5A$		22	25	m ohm
		$V_{GS} = 2.5V, I_D = 4A$		38	40	m ohm
Forward Transconductance	g_{FS}	$V_{DS} = 5V, I_D = 5A$		13		S
DYNAMIC CHARACTERISTICS^c						
Input Capacitance	C_{ISS}	$V_{DS} = 8V, V_{GS} = 0V$ $f = 1.0MHz$		800		pF
Output Capacitance	C_{OSS}			155		pF
Reverse Transfer Capacitance	C_{RSS}			125		pF
SWITCHING CHARACTERISTICS^c						
Turn-On Delay Time	$t_{D(ON)}$	$V_{DD} = 10V,$ $I_D = 1A,$ $V_{GEN} = 4.0V,$ $R_L = 10\text{ ohm}$ $R_{GEN} = 10\text{ ohm}$		18.3		ns
Rise Time	t_r			4.8		ns
Turn-Off Delay Time	$t_{D(OFF)}$			43.5		ns
Fall Time	t_f			20		ns
Total Gate Charge	Q_g	$V_{DS} = 10V, I_D = 4A,$ $V_{GS} = 4.0V$		11		nC
Gate-Source Charge	Q_{gs}			2.2		nC
Gate-Drain Charge	Q_{gd}			2.5		nC
Parameter	Symbol	Condition	Min	Typ ^c	Max	Unit
DRAIN-SOURCE DIODE CHARACTERISTICS^b						
Diode Forward Voltage	V_{SD}	$V_{GS} = 0V, I_S = 1.7A$	0.42		1.28	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.

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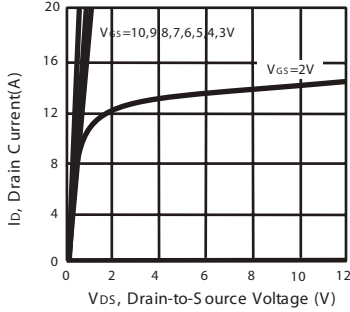


Figure 1. Output Characteristics

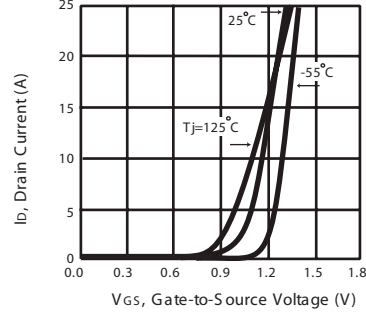


Figure 2. Transfer Characteristics

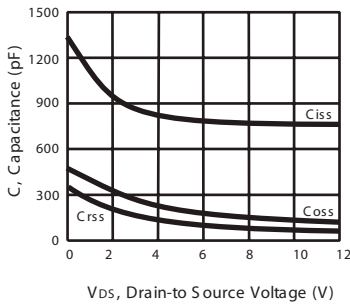


Figure 3. Capacitance

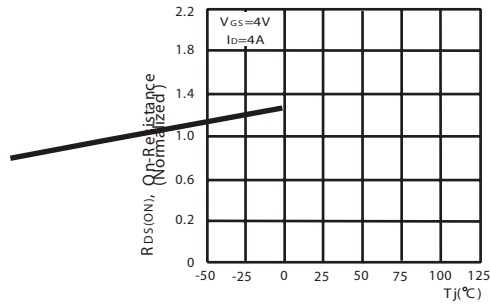
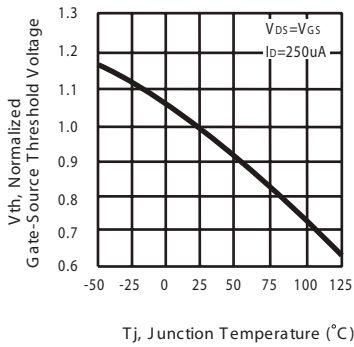


Figure 4. On-Resistance Variation with Temperature



with Temperature

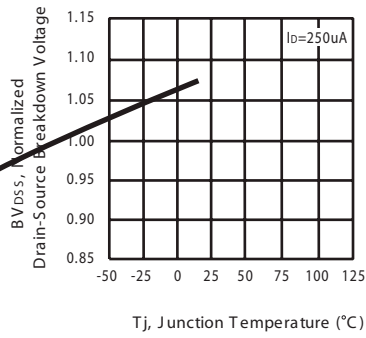


Figure 6. Breakdown Voltage Variation with Temperature

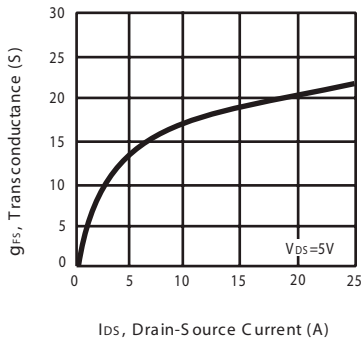


Figure 7. Transconductance Variation with Drain Current

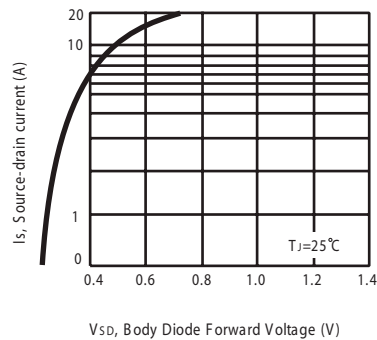


Figure 8. Body Diode Forward Voltage Variation with Source Current

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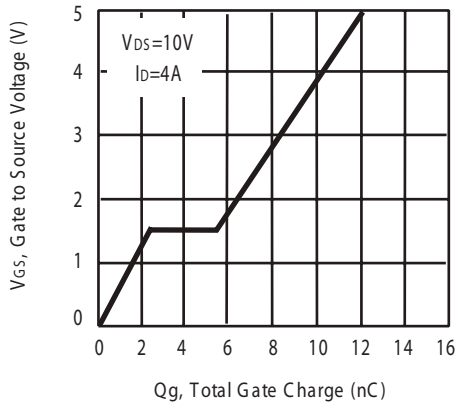


Figure 9. Gate Charge

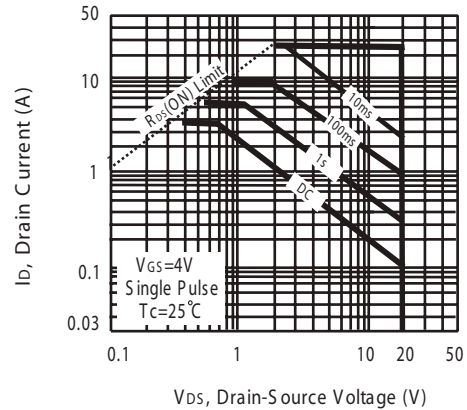


Figure 10. Maximum Safe Operating Area

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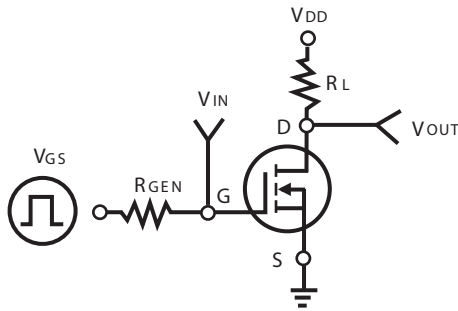


Figure 11. Switching Test Circuit

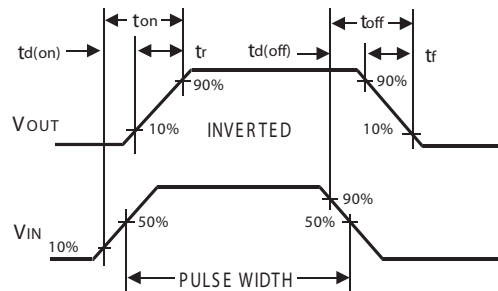
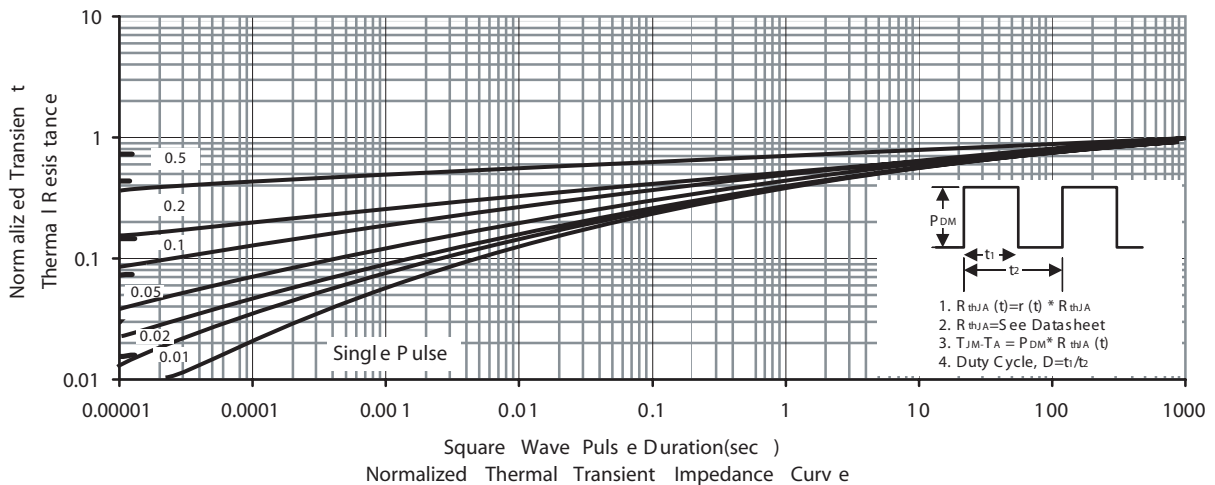


Figure 12. Switching Waveforms



1. $R_{\theta JA}(t) = F(t) * R_{\theta JA}$
2. $R_{\theta JA}$ = See Datasheet
3. $T_{JM-TA} = P_{DM} * R_{\theta JA}(t)$
4. Duty Cycle, $D = t_r / t_z$