



Dual N-Channel Enhancement Mode Power MOSFET **MX8205A-8PIN**

### MX8205A DESCRIPTION

The MX8205A uses advanced trench technology to provide excellent  $R_{DS(ON)}$  and low gate charge. It can be used in a wide variety of applications.

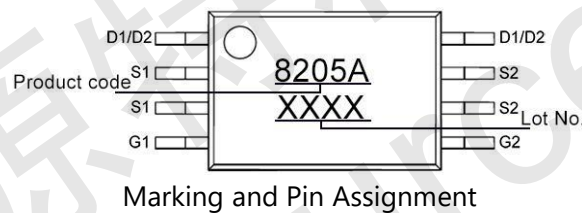
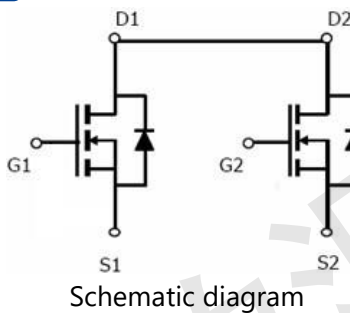
### MX8205A GENERAL FEATURES

- $V_{DS}=20V$ ,  $I_D=6A$   
 $R_{DS(ON)}(Typ.)=27m\Omega$  @  $V_{GS}=2.5V$   
 $R_{DS(ON)}(Typ.)=22m\Omega$  @  $V_{GS}=3.8V$   
 $R_{DS(ON)}(Typ.)=21m\Omega$  @  $V_{GS}=4.5V$
- High Power and current handling capability
- Lead free product is acquired
- Surface Mount Package

### MX8205A APPLICATION

- Battery protection
- Load switch

### MX8205A PINOUT



### MX8205A ORDERING INFORMATION

Part Number	Storage Temperature	Package	Devices Per Reel
MX8205A	-55°C to 150°C	TSSOP-8	5000

### MX8205A ABSOLUTE MAXIMUM RATINGS ( $T_A=25^\circ C$ unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	$V_{DS}$	20	V
Gate-Source Voltage	$V_{GS}$	$\pm 12$	V
Drain Current-Continuous	$I_D$	6	A
Drain Current-Pulsed (Note1)	$I_{DM}$	25	A
Maximum Power Dissipation	$P_D$	1.5	W
Operating Junction and Storage Temperature Range	$T_J, T_{STG}$	-55 to 150	$^\circ C$

### MX8205A THERMAL RESISTANCE

Thermal Resistance, Junction-to-Ambient (Note2)	$R_{\theta JA}$	83	$^\circ C/W$
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Note 1. Repetitive Rating: Pulse width limited by maximum junction temperature.

Note 2. Surface Mounted on FR4 Board,  $t \leq 10$  sec.



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**MX8205A ELECTRICAL CHARACTERISTICS** ( $T_A=25^\circ\text{C}$  unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
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**Off Characteristics**

Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS}=0V, I_D=250\mu A$	20	-	-	V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=20V, V_{GS}=0V$	-	-	1	$\mu A$
Gate-Body Leakage Current	$I_{GSS}$	$V_{GS}=\pm 12V, V_{DS}=0V$	-	-	$\pm 100$	nA

**On Characteristics** (Note 3)

Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	0.45	0.7	1.1	V
Drain-Source On-State Resistance	$R_{DS(on)}$	$V_{GS}=2.5V, I_D=3.5A$	25	27	35	$m\Omega$
		$V_{GS}=3.8V, I_D=4A$	20.5	22	29	$m\Omega$
		$V_{GS}=4.5V, I_D=4.5A$	20	21	27	$m\Omega$
Forward Transconductance	$g_{FS}$	$V_{DS}=5V, I_D=4.5A$	-	10	-	S

**Dynamic Characteristics** (Note 4)

Input Capacitance	$C_{iss}$	$V_{DS}=10V, V_{GS}=0V,$ $F=1.0MHz$	-	600	-	pF
Output Capacitance	$C_{oss}$		-	330	-	pF
Reverse Transfer Capacitance (Note 4)	$C_{rss}$		-	140	-	pF

**Switching Characteristics** (Note 4)

Turn-on Delay Time	$t_{d(on)}$	$V_{DD}=10V, I_D=1A$ $V_{GS}=4.5V, R_{GEN}=6\Omega$	-	10	-	nS
Turn-on Rise Time	$t_r$		-	11	-	nS
Turn-Off Delay Time	$t_{d(off)}$		-	35	-	nS
Turn-Off Fall Time	$t_f$		-	30	-	nS
Total Gate Charge	$Q_g$	$V_{DS}=10V, I_D=6A,$ $V_{GS}=4.5V$	-	10	-	nC
Gate-Source Charge	$Q_{gs}$		-	1.5	-	nC
Gate-Drain Charge	$Q_{gd}$		-	2.3	-	nC

**Drain-Source Diode Characteristics**

Diode Forward Voltage (Note 3)	$V_{SD}$	$V_{GS}=0V, I_S=1A$	-	-	1.2	V
Diode Forward Current (Note 2)	$I_S$		-	-	1.7	A

Note 2. Surface Mounted on FR4 Board,  $t \leq 10$  sec.

Note 3. Pulse Test: Pulse Width  $\leq 300\mu s$ , Duty Cycle  $\leq 2\%$ .

Note 4. Guaranteed by design, not subject to product.



## MX8205A TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

Figure 1. Switching Test Circuit

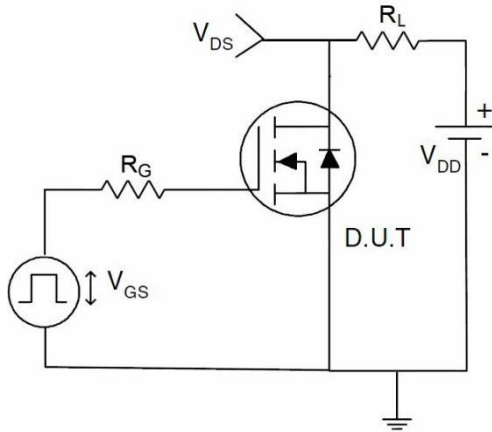


Figure 2. Switching Waveform

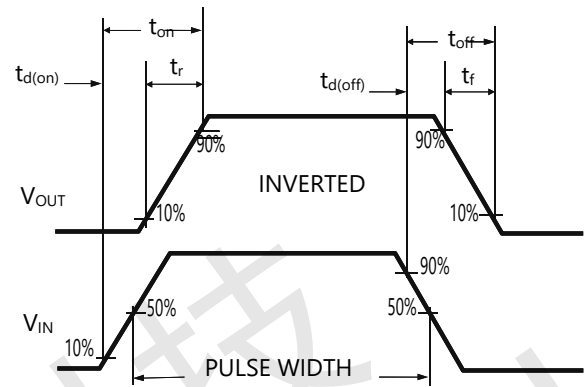


Figure 3. Power Dissipation

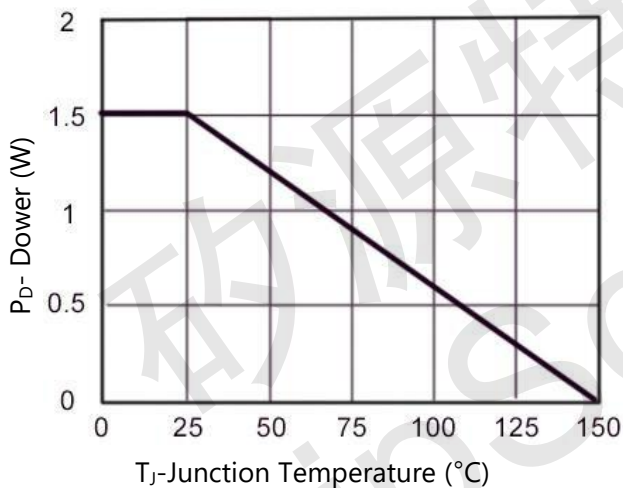


Figure 4. Drain Current

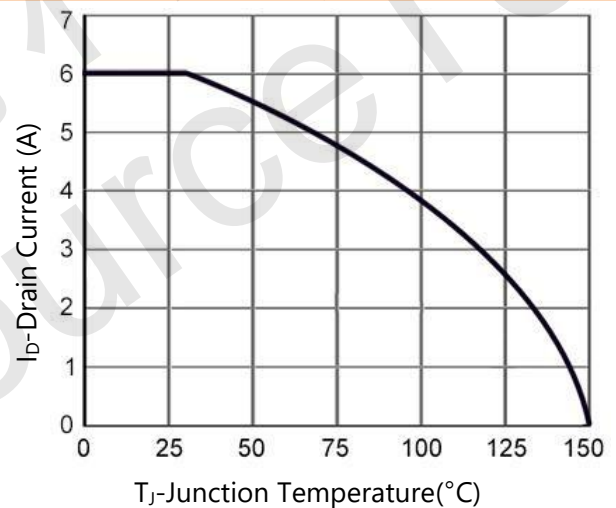


Figure 5. Output Characteristics

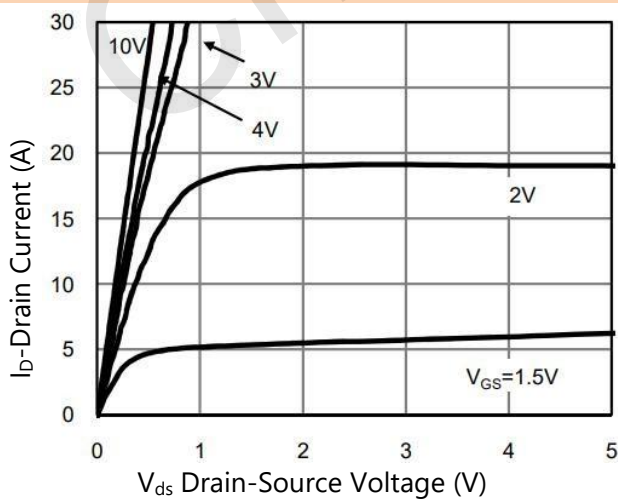
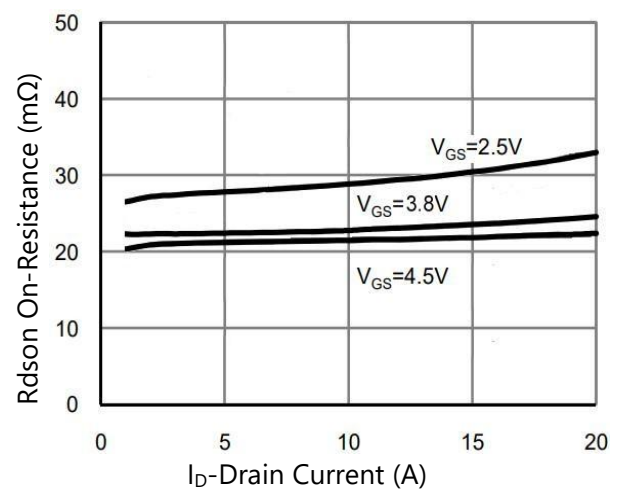


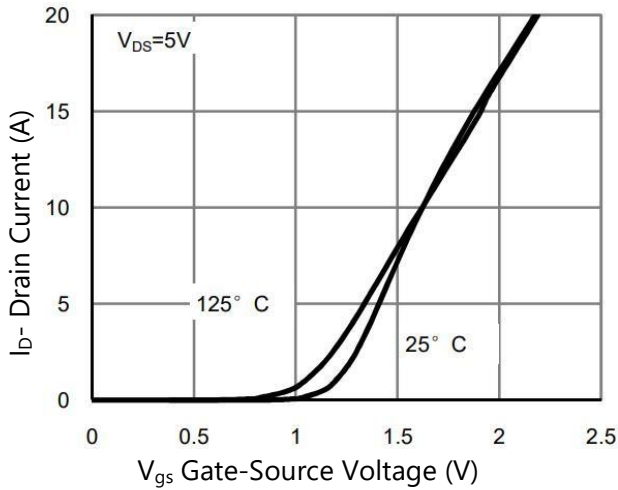
Figure 6. R<sub>ds(on)</sub> vs Drain Current



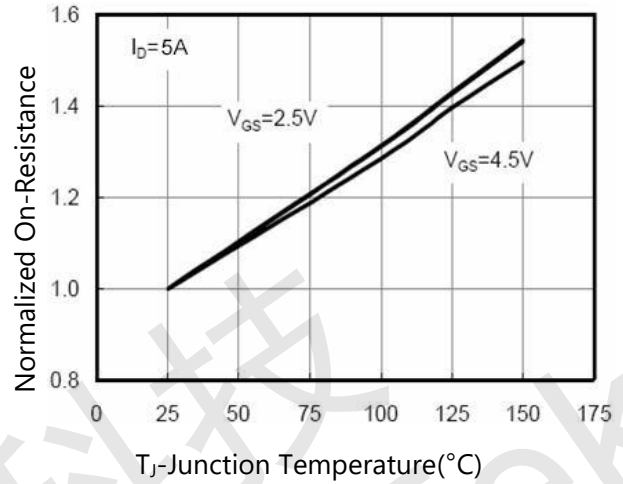


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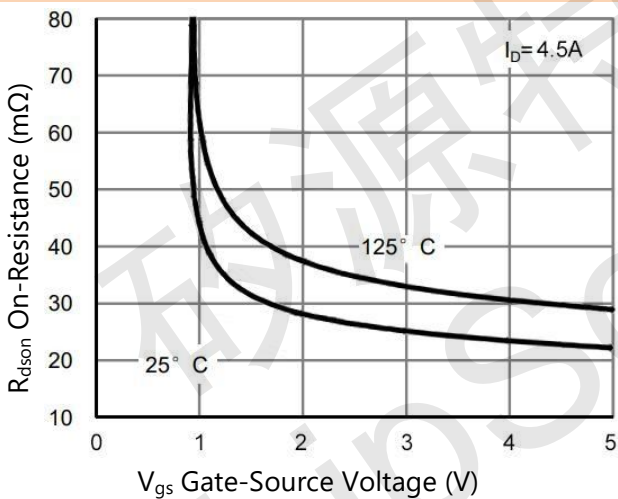
**Figure 7. Transfer Characteristics**



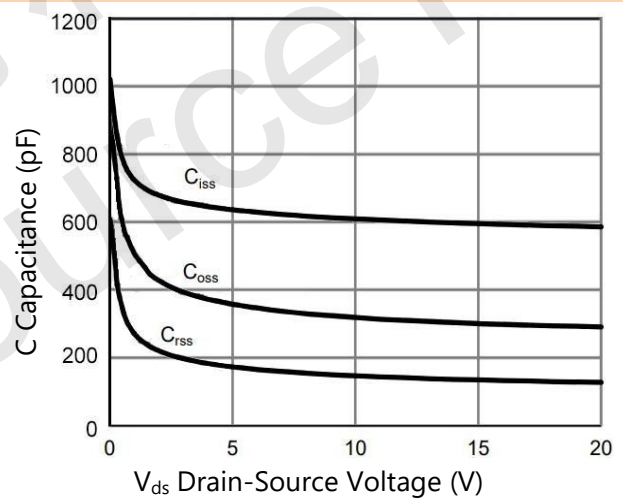
**Figure 8.  $R_{dson}$  vs Junction Temperature**



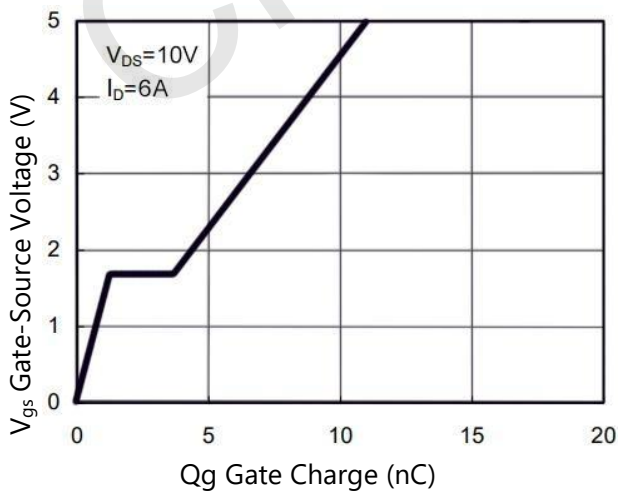
**Figure 9.  $R_{dson}$  vs  $V_{GS}$**



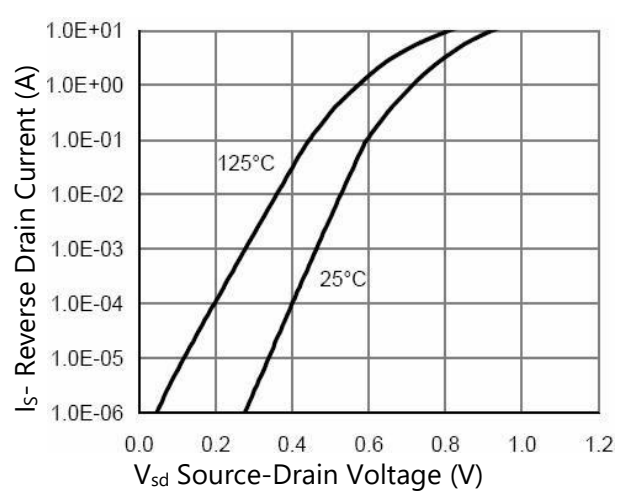
**Figure 10. Capacitance vs  $V_{ds}$**



**Figure 11. Gate Charge**



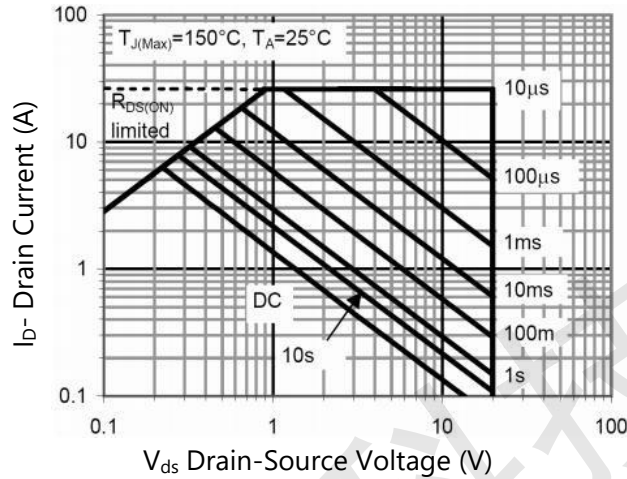
**Figure 12. Source-Drain Diode Forward**



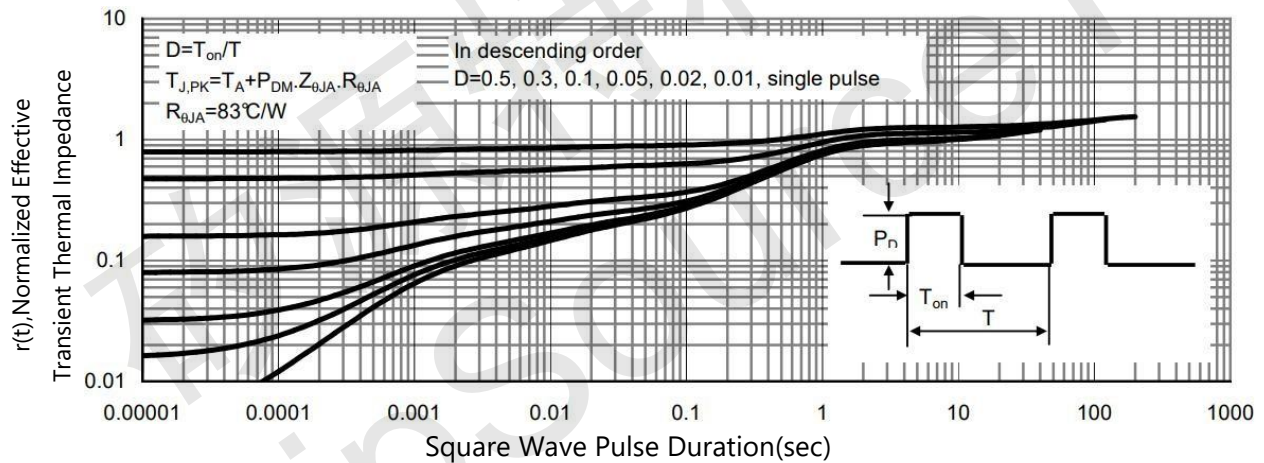


**MX8205A TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS**

**Figure 13. Safe Operation Area**



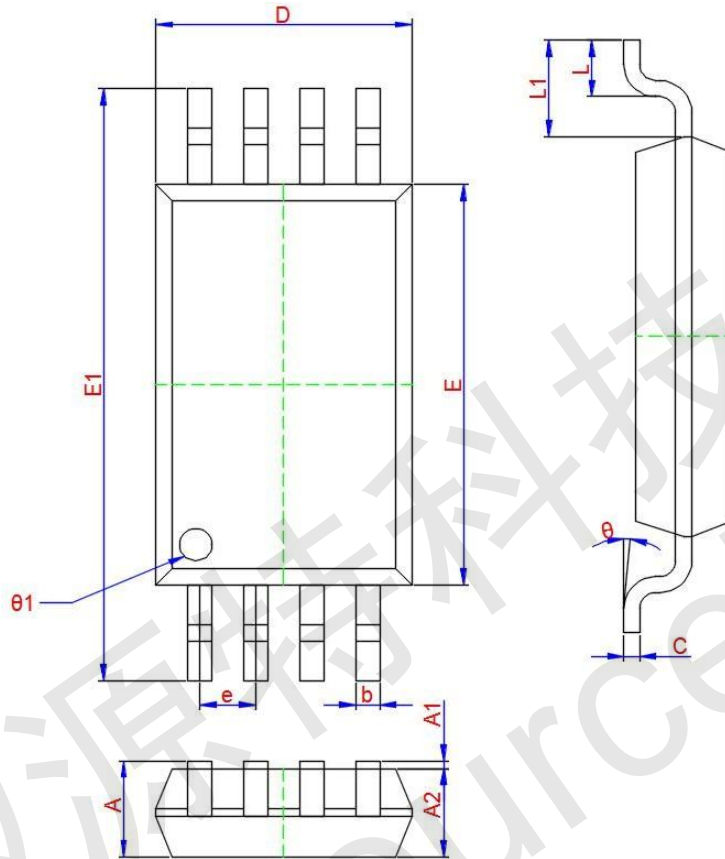
**Figure 14. Normalized Maximum Transient Thermal Impedance**





**MX8205A PACKAGE INFORMATION**

**TSSOP-8**



Symbol	Dimensions In Millimeters		
	Min.	Typ.	Max.
A	1.000	1.150	1.200
A1	0.020	0.100	0.180
A2	0.900	1.000	1.100
b	0.170	0.220	0.270
c	0.122	0.127	0.132
L	0.400	0.600	0.800
D	2.870	2.970	3.070
E	4.300	4.400	4.500
E1	6.200	6.400	6.600
$\theta 1$	0.500	0.600	0.700
$\theta$	0°	5°	10°
L1	1.00TYP		
e	0.65TYP		