



## N-Channel Enhancement Mode Power MOSFET

### Description

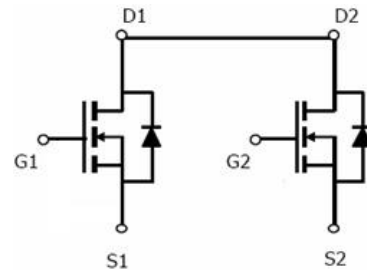
The PE8203A uses advanced trench technology to provide excellent  $R_{DS(ON)}$  and low gate charge. It can be used in a wide variety of applications.

### General Features

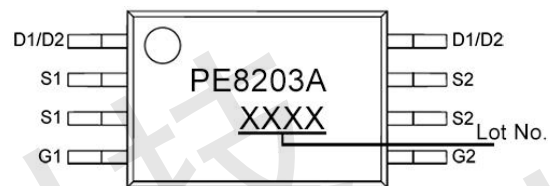
- $V_{DS} = 18V$ ,  $I_D = 7A$
- $R_{DS(ON)} < 24m\Omega @ V_{GS}=4.5V$
- $R_{DS(ON)} < 25m\Omega @ V_{GS}=3.8V$
- $R_{DS(ON)} < 32m\Omega @ V_{GS}=2.5V$
- High Power and current handling capability
- Lead free product is acquired
- Surface Mount Package

### Application

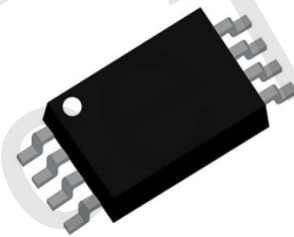
- Battery Protection
- Load switch



Schematic diagram



Marking and pin assignment



TSSOP-8

### Absolute Maximum Ratings (TA=25°C unless otherwise noted)

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	$V_{DS}$	18	V
Gate-Source Voltage	$V_{GS}$	$\pm 12$	V
Drain Current-Continuous	$I_D$	7	A
Pulsed Drain Current (Note 1)	$I_{DM}$	30	A
Maximum Power Dissipation	$P_D$	1.5	W
Operating Junction and Storage Temperature Range	$T_J, T_{STG}$	-55 To 150	°C

### Thermal Characteristic

Thermal Resistance, Junction-to-Ambient (Note 2)	$R_{\theta JA}$	83	°C/W
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**Electrical Characteristics (TA=25°C unless otherwise noted)**

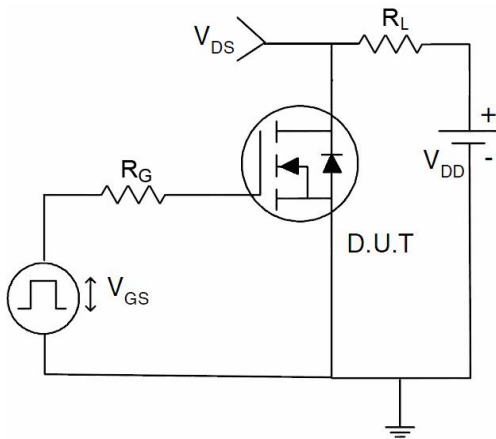
Parameter	Symbol	Condition	Min	Typ	Max	Unit
<b>Off Characteristics</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS}=0V, I_D=250\mu A$	-	18	-	V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=16V, V_{GS}=0V$	-	-	1	$\mu A$
Gate-Body Leakage Current	$I_{GSS}$	$V_{GS}=\pm 12V, V_{DS}=0V$	-	-	$\pm 100$	nA
<b>On Characteristics (Note 3)</b>						
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	$R_{DS(on)}$	$V_{GS}=4.5V, I_D=6A$	17	18	24	m $\Omega$
		$V_{GS}=3.8V, I_D=5A$	17.5	19	25	m $\Omega$
		$V_{GS}=2.5V, I_D=4A$	21	24	32	m $\Omega$
Forward Transconductance	$g_{FS}$	$V_{DS}=5V, I_D=5A$	-	10	-	S
<b>Dynamic Characteristics (Note 4)</b>						
Input Capacitance	$C_{iss}$	$V_{DS}=10V, V_{GS}=0V,$ $F=1.0MHz$	-	710	-	pF
Output Capacitance	$C_{oss}$		-	346	-	pF
Reverse Transfer Capacitance (Note 4)	$C_{rss}$		-	160	-	pF
<b>Switching Characteristics</b>						
Turn-on Delay Time	$t_{d(on)}$	$V_{DD}=10V, I_D=1A,$ $V_{GS}=4.5V, R_{GEN}=6\Omega$	-	12	-	nS
Turn-on Rise Time	$t_r$		-	16	-	nS
Turn-Off Delay Time	$t_{d(off)}$		-	52	-	nS
Turn-Off Fall Time	$t_f$		-	44	-	nS
Total Gate Charge	$Q_g$	$V_{DS}=10V, I_D=6A,$ $V_{GS}=4.5V$	-	11	-	nC
Gate-Source Charge	$Q_{gs}$		-	1.7	-	nC
Gate-Drain Charge	$Q_{gd}$		-	2.7	-	nC
<b>Drain-Source Diode Characteristics</b>						
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

**Notes:**

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board,  $t \leq 10$  sec.
3. Pulse Test: Pulse Width  $\leq 300\mu s$ , Duty Cycle  $\leq 2\%$ .
4. Guaranteed by design, not subject to product.



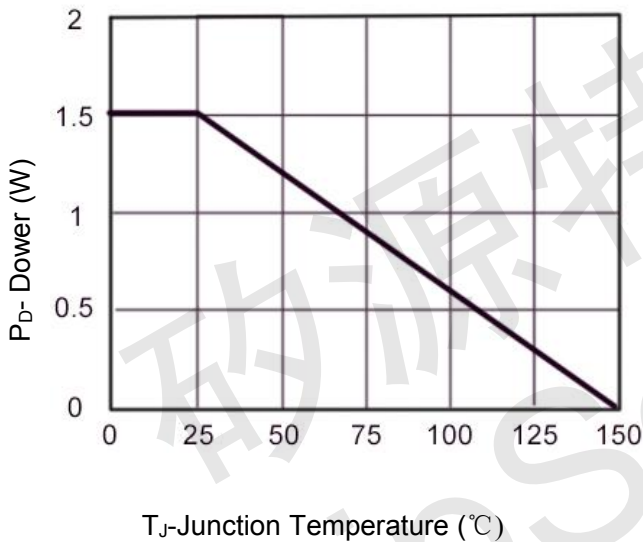
**Typical Electrical and Thermal Characteristics**



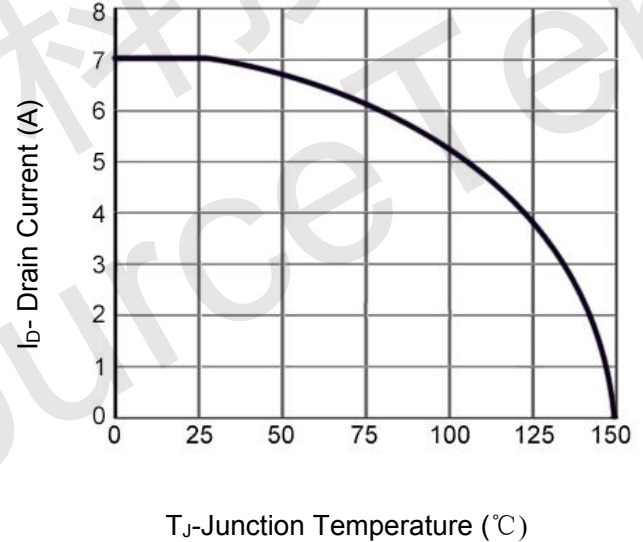
**Figure 1 Switching Test Circuit**



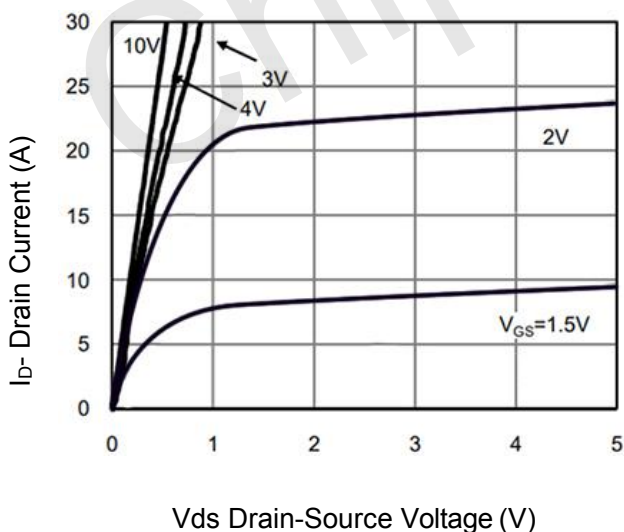
**Figure 2 Switching Waveform**



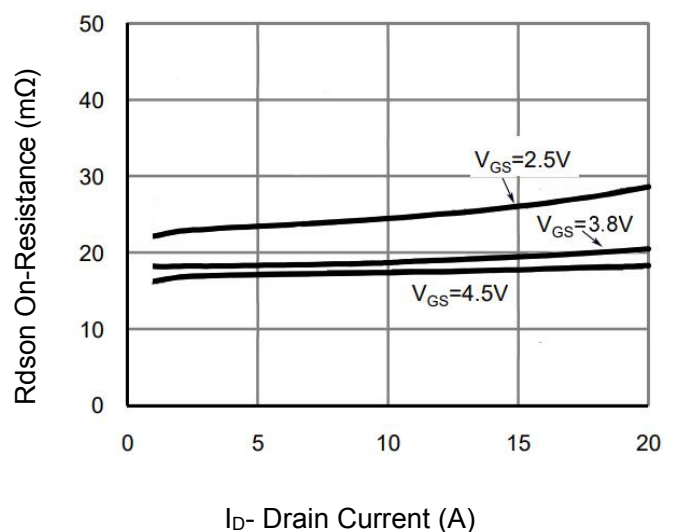
**Figure 3 Power Dissipation**



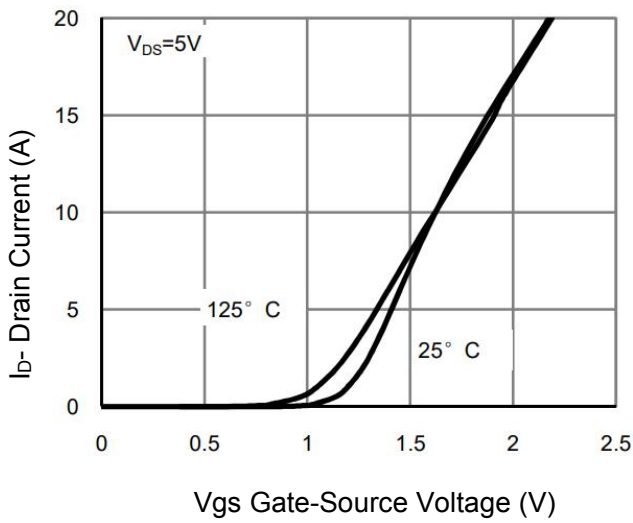
**Figure 4 Drain Current**



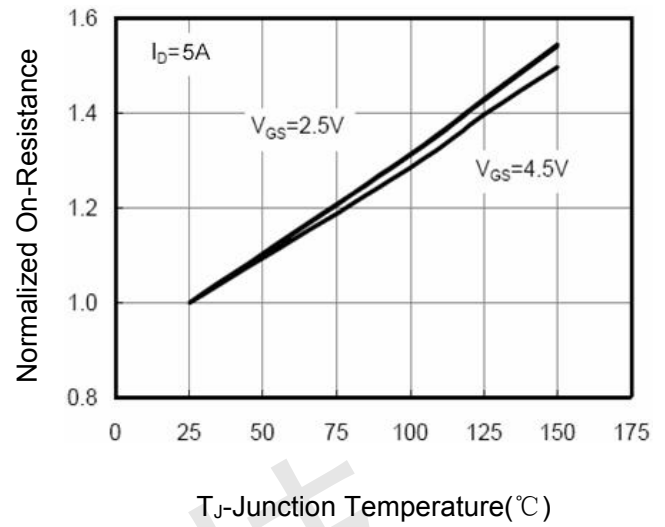
**Figure 5 Output Characteristics**



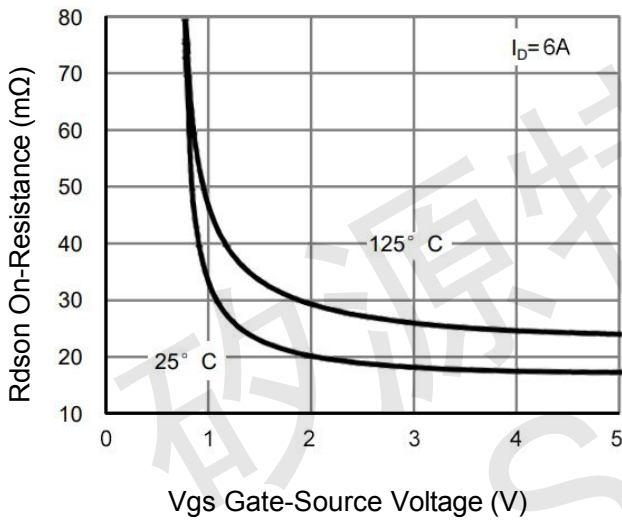
**Figure 6 R<sub>dson</sub> vs Drain Current**



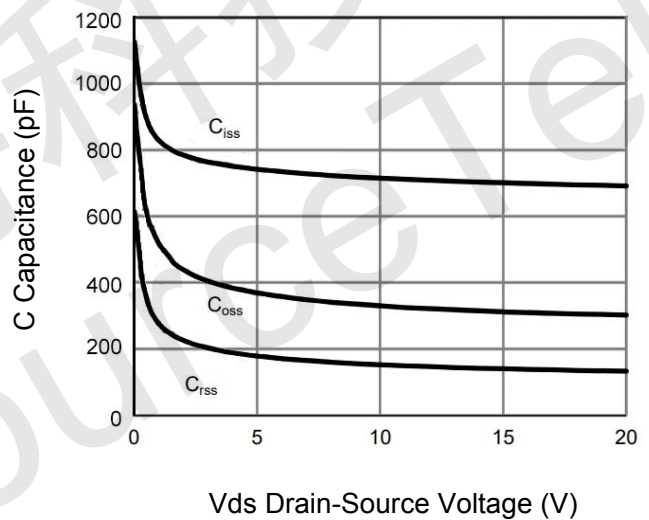
**Figure 7 Transfer Characteristics**



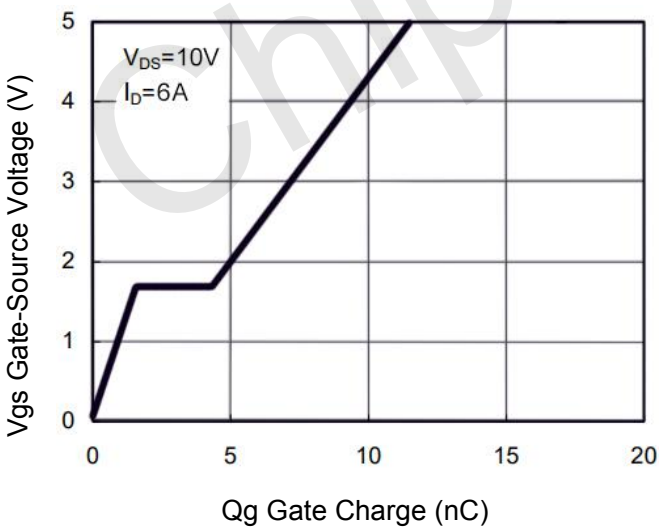
**Figure 8 Rdson vs Junction Temperature**



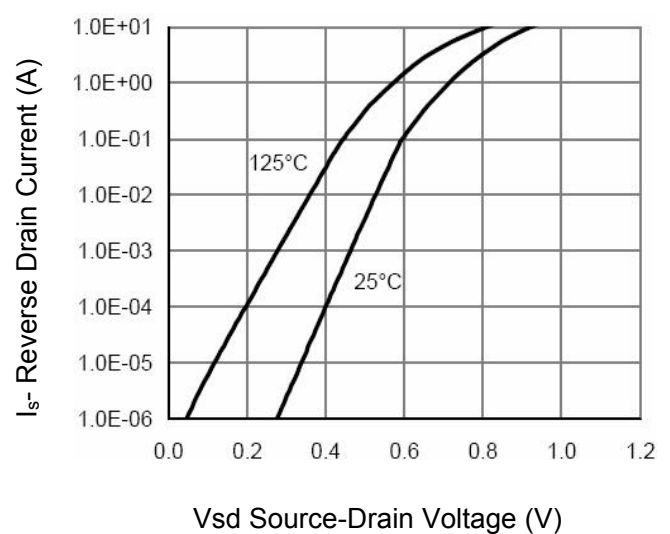
**Figure 9 Rdson vs Vgs**



**Figure 10 Capacitance vs Vds**



**Figure 11 Gate Charge**



**Figure 12 Source- Drain Diode Forward**

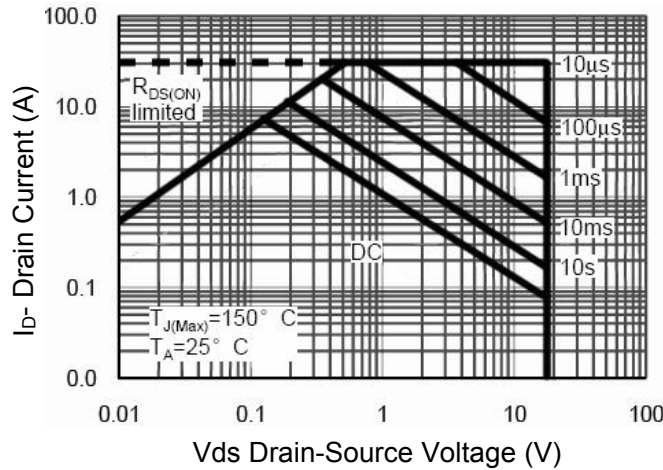


Figure 13 Safe Operation Area

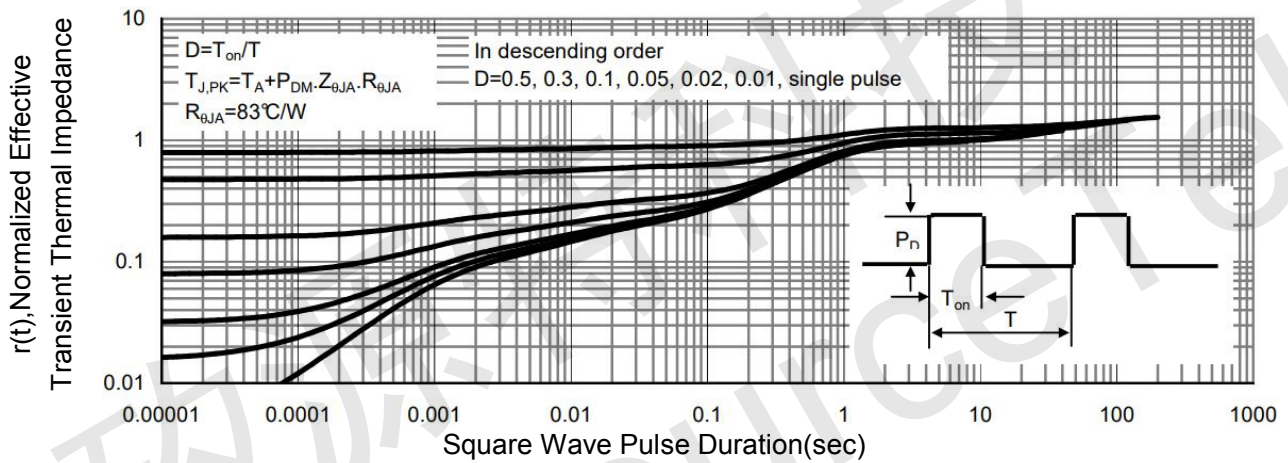
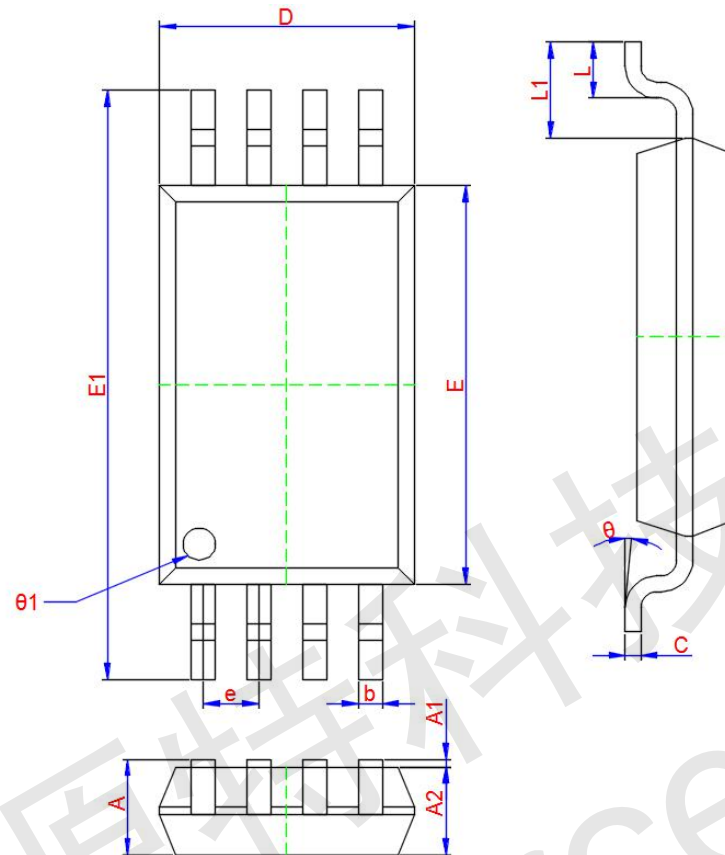


Figure 14 Normalized Maximum Transient Thermal Impedance





**TSSOP-8 Package Information**



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
$\theta1$	0.500	0.600	0.700
$\theta$	0°	5°	10°
L1	1.00TYP		
e	0.65TYP		