PJM08C40PA

N and P-Channel Complementary Power MOSFET

Product Summary

- **N-Channel**
- V_{DS}= 40V,I_D= 8A
- $R_{DS(on)}$< 19mΩ @V_{GS}= 10V
- $R_{DS(on)}$< 29mΩ @V_{GS}= 4.5V
- **P-Channel**
- V_{DS}= -40V,I_D= -7A
- $R_{DS(on)}$< 35mΩ @V_{GS}= -10V
- $R_{DS(on)}$< 45mΩ @V_{GS}= -4.5V

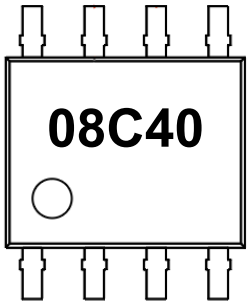
Features

- Advanced Trench Technology
- 100% Avalanche Tested
- RoHS and Reach Compliant
- Halogen and Antimony Free
- Moisture Sensitivity Level 3

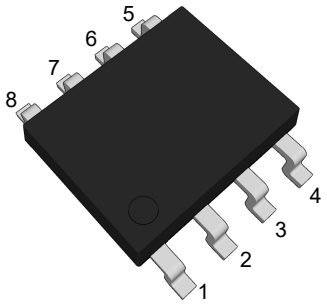
Application

- Power Management

Marking Code



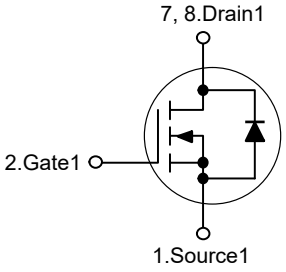
SOP-8



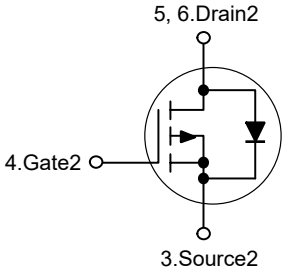
(Top View)

Pin	Description	Pin	Description
1	Source1	4	Gate2
2	Gate1	5,6	Drain2
3	Source2	7,8	Drain1

Schematic Diagram



N-Channel



P-Channel

Absolute Maximum Ratings

Ratings at 25℃ ambient temperature unless otherwise specified.

Parameter	Symbol	N-Channel	P-Channel	Unit
Drain-Source Voltage	V_{DS}	40	-40	V
Gate-Source Voltage	V_{GS}	±20		V
Drain Current-Continuous	I_D	8	-7	A
Drain Current-Pulsed Note1	I_{DM}	40	-30	A
Maximum Power Dissipation	P_D	2		W
Junction Temperature	T_J	150		°C
Storage Temperature Range	T_{STG}	-55 to +150		°C

Thermal Characteristics

Thermal Resistance,Junction-to-Ambient Note2	$R_{\theta JA}$	62.5	62.5	°C/W

N-Channel

Electrical Characteristics

(T_a=25°C unless otherwise specified)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS}=0V,I_D=250μA	40	--	--	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=40V,V_{GS}=0V	--	--	1	μA
Gate-Body Leakage Current	I_{GSS}	V_{GS}=±20V,V_{DS}=0V	--	--	±100	nA
Gate Threshold Voltage Note3	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=250μA	1	1.5	2	V
Drain-Source On-Resistance Note3	$R_{DS(on)}$	V_{GS}=10V,I_D=8A	--	14	19	mΩ
		V_{GS}=10V,I_D=4A	--	19	29	mΩ
Forward Transconductance Note3	g_{FS}	V_{DS}=5V,I_D=8A	33	--	--	S
Dynamic Characteristics						
Input Capacitance	C_{iss}	V_{DS}=20V,V_{GS}=0V,f=1MHz	--	415	--	pF
Output Capacitance	C_{oss}		--	112	--	pF
Reverse Transfer Capacitance	C_{rss}		--	11	--	pF
Total Gate Charge	Q_g	V_{DS}=20V,I_D=8A, V_{GS}=10V	--	12	--	nC
Gate-Source Charge	Q_{gs}		--	3.2	--	nC
Gate-Drain Charge	Q_{gd}		--	3.1	--	nC
Switching Characteristics						
Turn-on Delay Time	$t_{d(on)}$	V_{DD}=15V,R_L=2.5Ω V_{GS}=10V,R_{GEN}=3Ω	--	4	--	nS
Turn-on Rise Time	t_r		--	3	--	nS
Turn-off Delay Time	$t_{d(off)}$		--	15	--	nS
Turn-off Fall Time	t_f		--	2	--	nS
Source-Drain Diode Characteristics						
Diode Forward Voltage Note3	V_{SD}	V_{GS}=0V,I_S=8A	--	0.8	1.2	V
Diode Forward Current Note2	I_S		--	--	8	A

Note: 1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2.Surface Mounted on FR4 Board, t ≤ 10 sec.
3.Pulse Test: Pulse width≤300μs, duty cycle≤2%

P-Channel

Electrical Characteristics

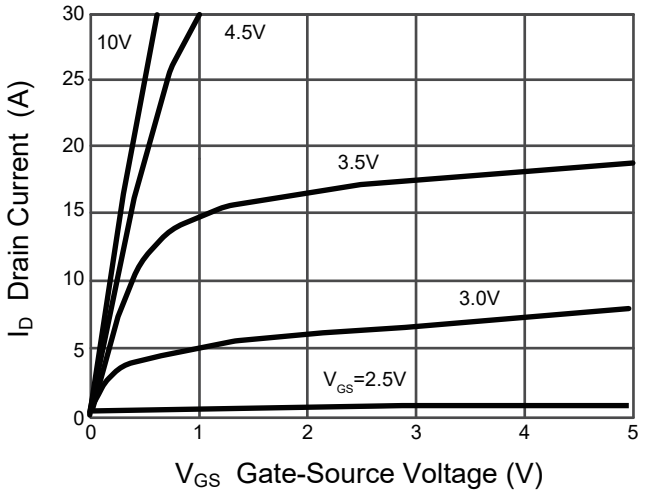
(T_a=25°C unless otherwise specified)

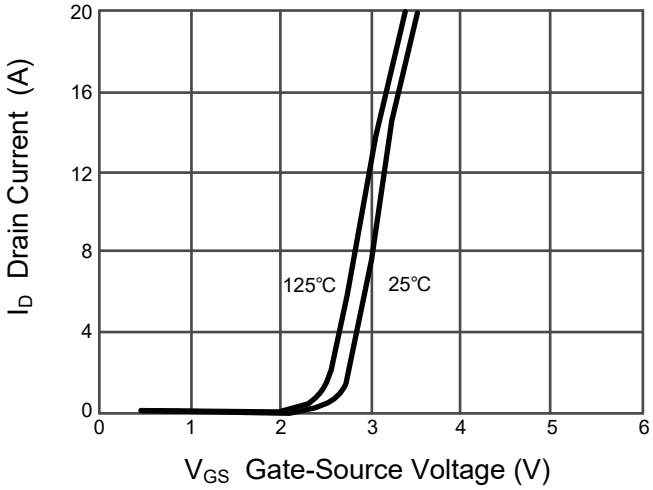
Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	$-V_{(BR)DSS}$	V_{GS}=0V,I_D=-250μA	40	--	--	V
Zero Gate Voltage Drain Current	$-I_{DSS}$	V_{DS}=-40V,V_{GS}=0V	--	--	1	μA
Gate-Body Leakage Current	I_{GSS}	V_{GS}=±20V,V_{DS}=0V	--	--	±100	nA
Gate Threshold Voltage Note3	$-V_{GS(th)}$	V_{DS}=V_{GS},I_D=-250μA	1	1.5	2	V
Drain-Source On-Resistance Note3	$R_{DS(on)}$	V_{GS}=-10V,I_D=-8A	--	29	35	mΩ
		V_{GS}=-4.5V,I_D=-4A	--	34	45	mΩ
Forward Transconductance Note3	g_{FS}	V_{DS}=-5V,I_D=-8A	10	--	--	S
Dynamic Characteristics						
Input Capacitance	C_{iss}	V_{DS}=-20V,V_{GS}=0V,f=1MHz	--	520	--	pF
Output Capacitance	C_{oss}		--	100	--	pF
Reverse Transfer Capacitance	C_{rss}		--	65	--	pF
Total Gate Charge	Q_g	V_{DS}=-20V, I_D=-8A, V_{GS}=-10V	--	13	--	nC
Gate-Source Charge	Q_{gs}		--	3.8	--	nC
Gate-Drain Charge	Q_{gd}		--	3.1	--	nC
Switching Characteristics						
Turn-on Delay Time	$t_{d(on)}$	V_{DD}=-20V, R_L=2.3Ω V_{GS}=-10V, R_{GEN}=6Ω	--	7.5	--	nS
Turn-on Rise Time	t_r		--	5.5	--	nS
Turn-off Delay Time	$t_{d(off)}$		--	19	--	nS
Turn-off Fall Time	t_f		--	7	--	nS
Source-Drain Diode Characteristics						
Diode Forward Voltage Note3	$-V_{SD}$	V_{GS}=0V,I_S=-7A	--	--	1.2	V
Diode Forward Current Note2	$-I_S$		--	--	7	A

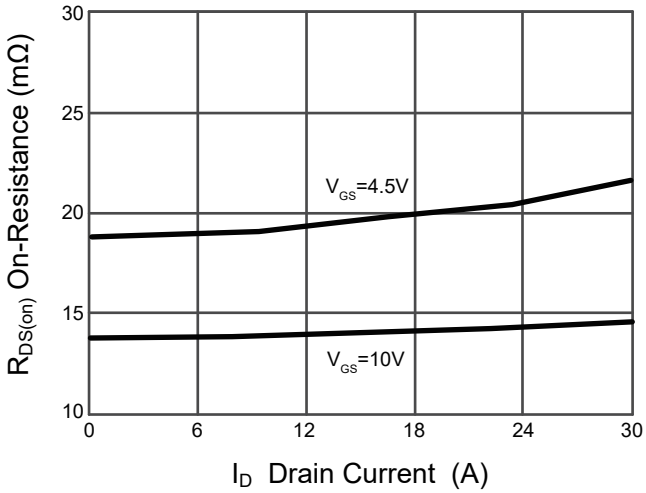
Note: 1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2.Surface Mounted on FR4 Board, t ≤ 10 sec.
3.Pulse Test: Pulse width≤300μs, duty cycle≤2%

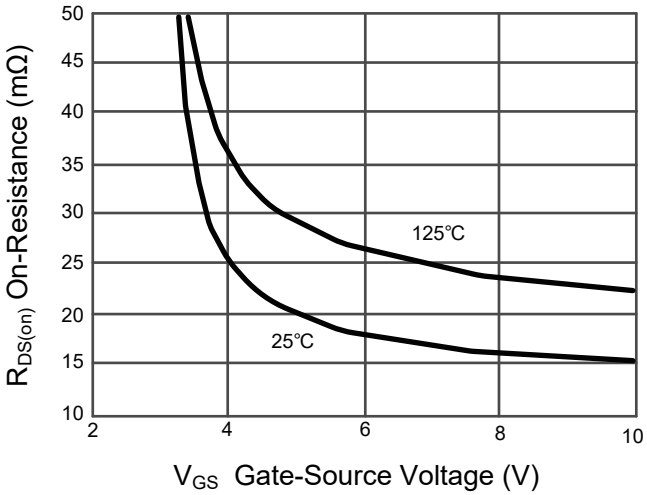
N-Channel

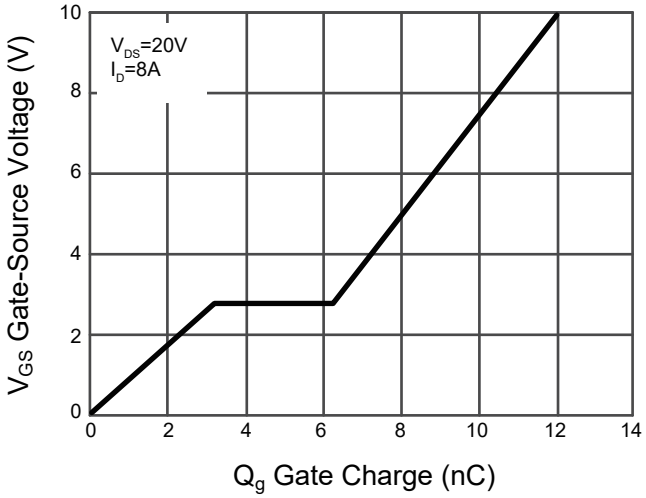
Typical Characteristics Curves

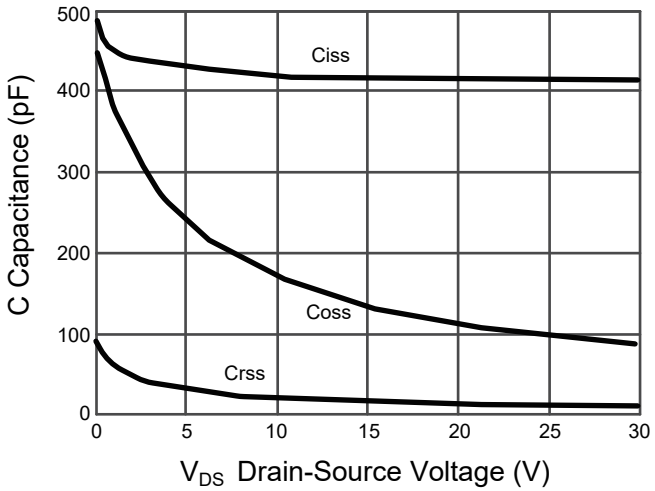


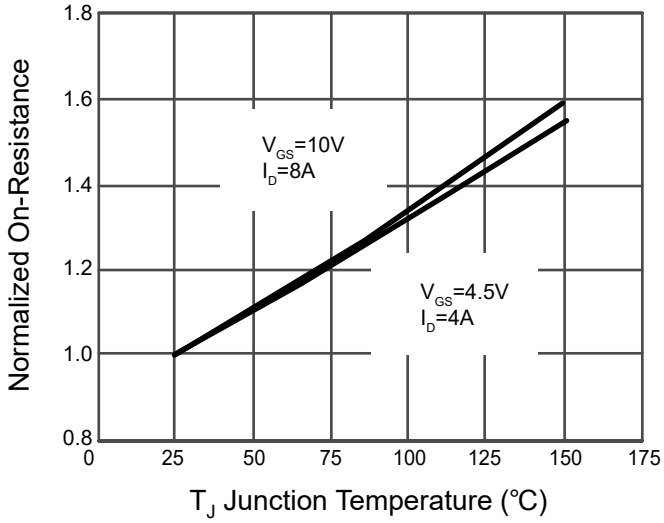


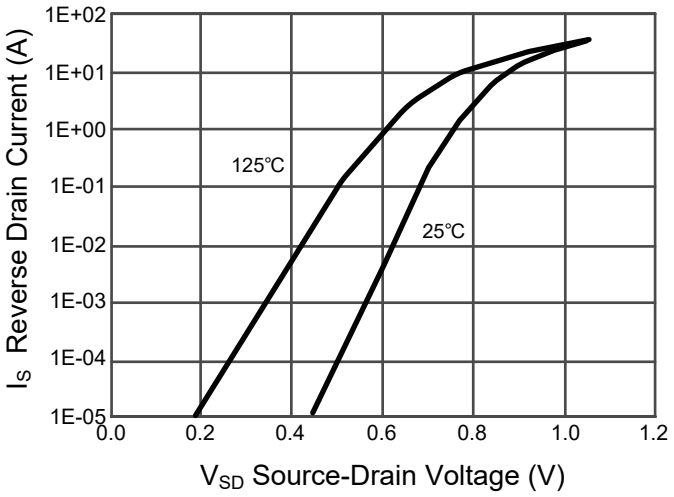


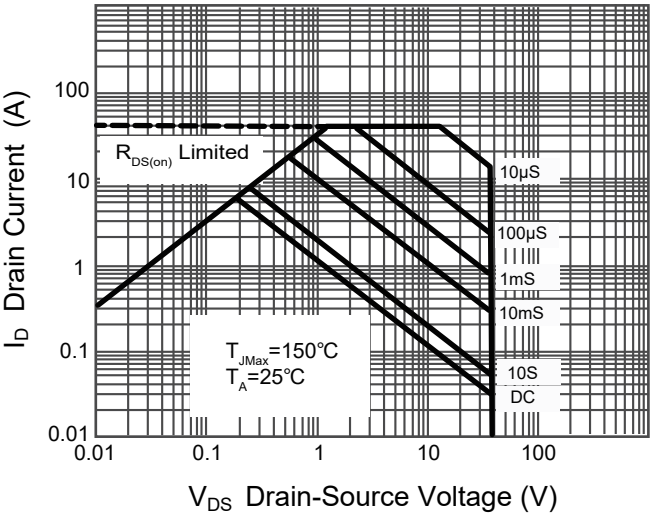


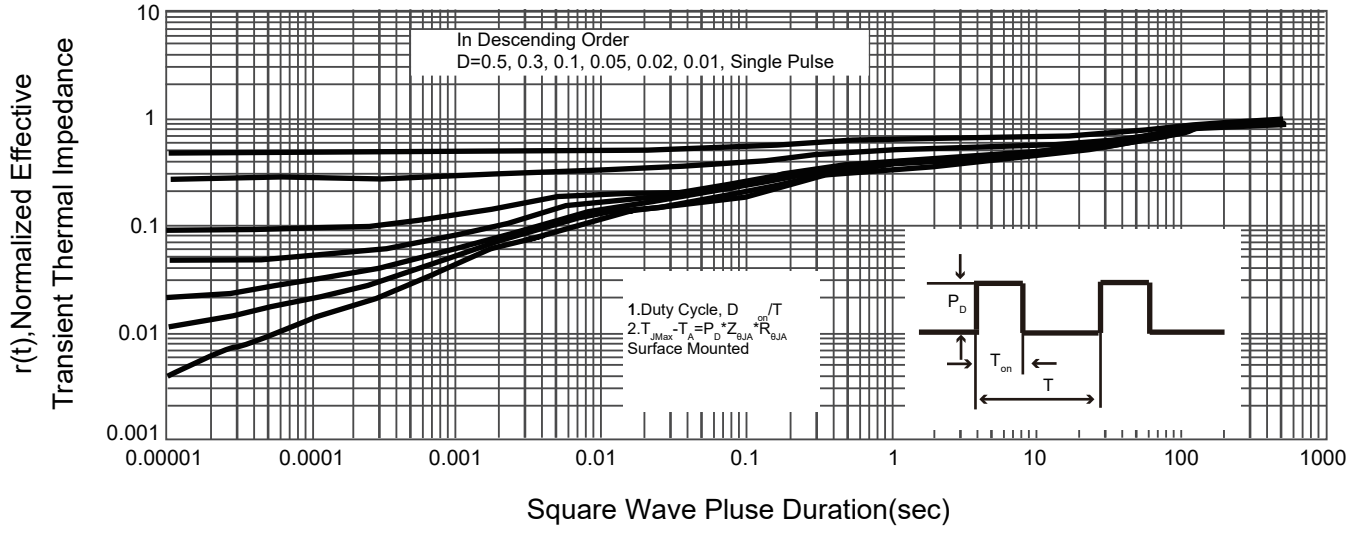





Normalized On-Resistance
1.8
1.6
1.4
1.2
1.0
0.8
0
25
50
75
100
125
150
175
V_{GS}=10V
I_D=8A
V_{GS}=4.5V
I_D=4A
T_J Junction Temperature (℃)

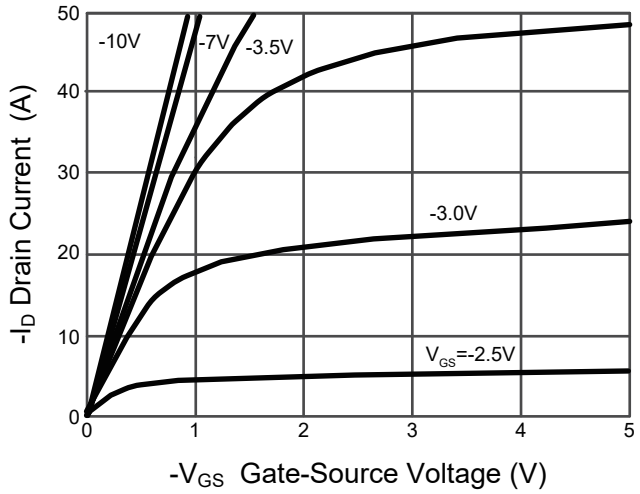

I_S Reverse Drain Current (A)
1E+02
1E+01
1E+00
1E-01
1E-02
1E-03
1E-04
1E-05
0.0
0.2
0.4
0.6
0.8
1.0
1.2
125℃
25℃
V_{SD} Source-Drain Voltage (V)

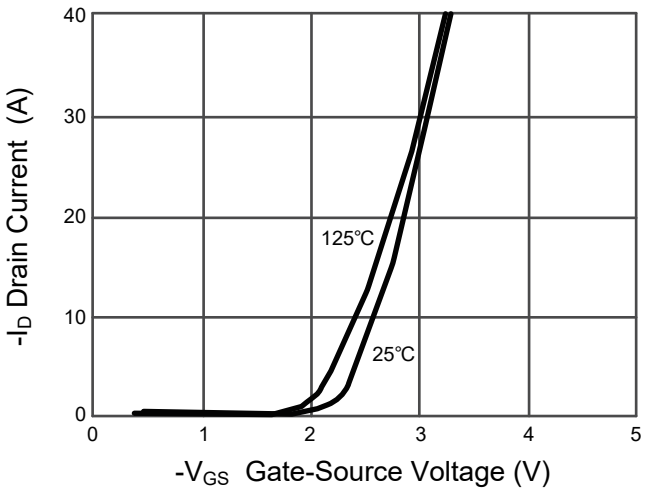

I_D Drain Current (A)
100
10
1
0.1
0.01
0.01
0.1
1
10
100
$R_{DS(on)}$ Limited
10μS
100μS
1mS
10mS
10S
DC
T_{JMax}=150℃
T_A=25℃
V_{DS} Drain-Source Voltage (V)

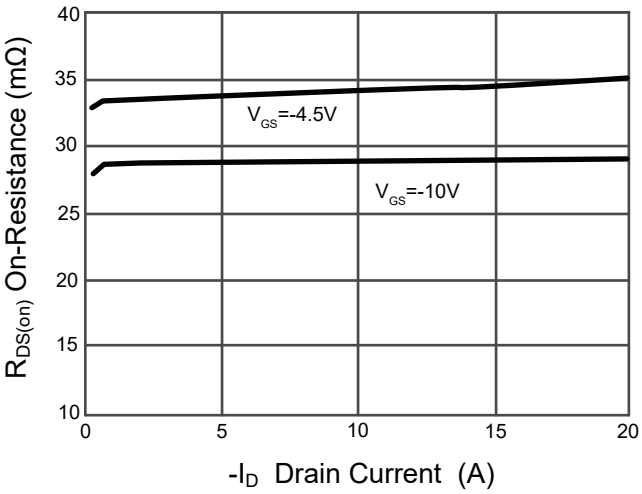

r(t),Normalized Effective Transient Thermal Impedance
10
1
0.1
0.01
0.001
0.00001
0.0001
0.001
0.01
0.1
1
10
100
1000
In Descending Order
D=0.5, 0.3, 0.1, 0.05, 0.02, 0.01, Single Pulse
1.Duty Cycle, D = t_{on}/T
2.T_{JMax}-T_A=P_D*$Z_{\theta JA}$*$R_{\theta JA}$
Surface Mounted
P_D
T_{on}
T
Square Wave Pluse Duration(sec)

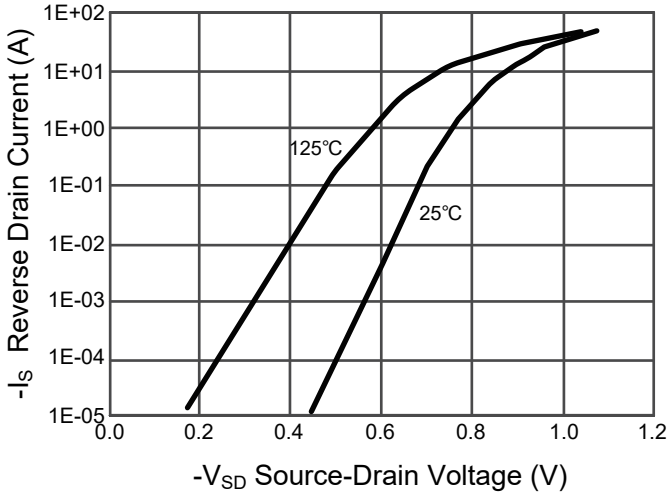
P-Channel

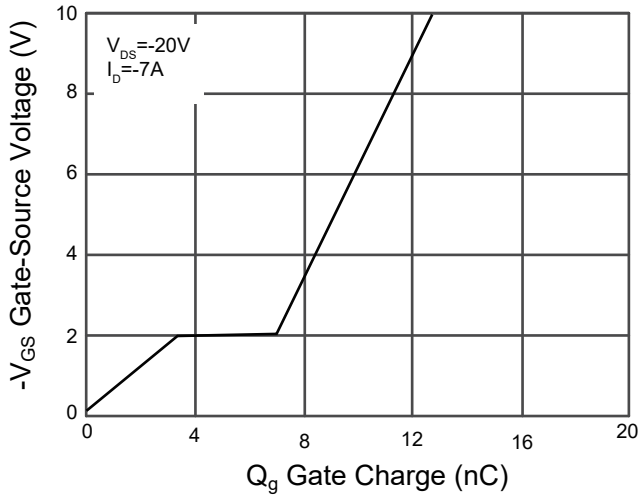
Typical Characteristics Curves

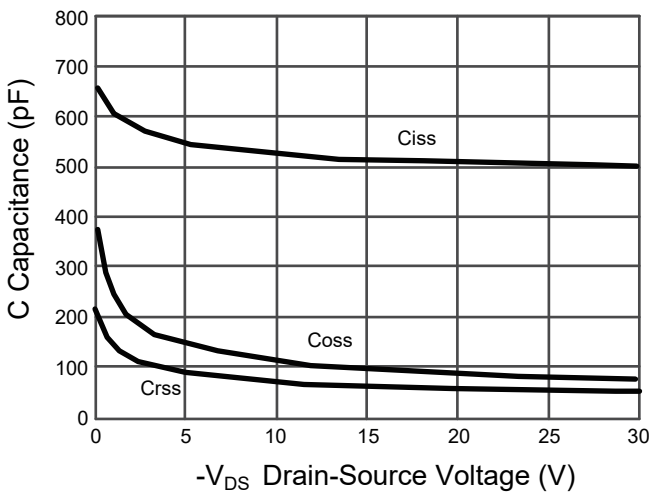


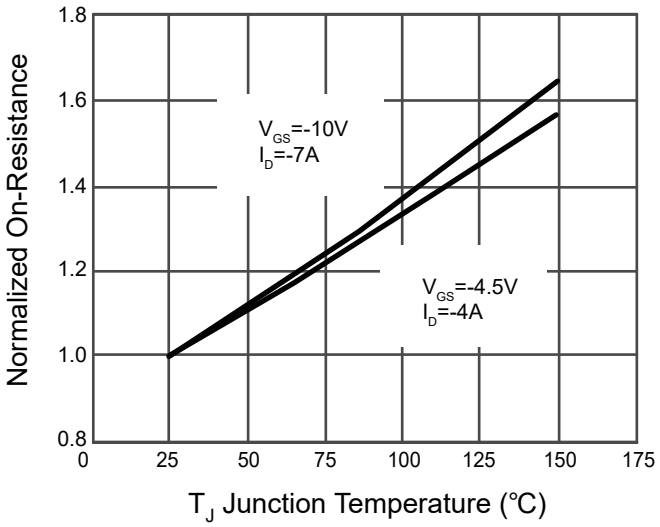








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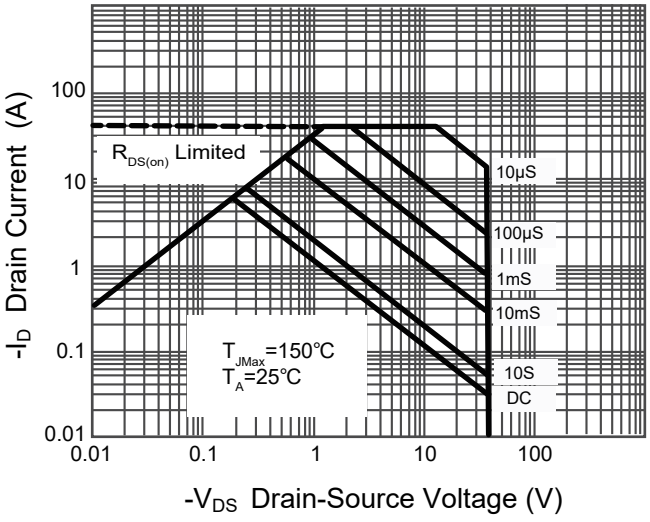
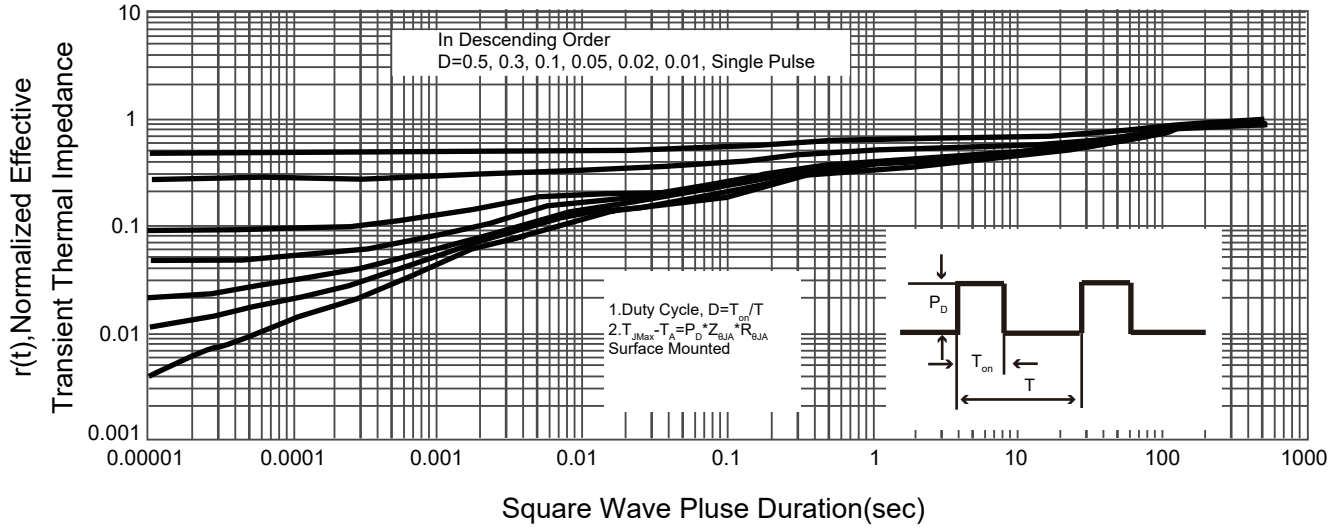
T_J Junction Temperature (℃)


$-I_D$ Drain Current (A)
100
10
1
0.1
0.01
0.01
0.1
1
10
100
$R_{DS(on)}$ Limited
10μS
100μS
1mS
10mS
10S
DC
T_{JMax}=150℃
T_A=25℃
$-V_{DS}$ Drain-Source Voltage (V)


r(t),Normalized Effective Transient Thermal Impedance
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0.1
0.01
0.001
0.00001
0.0001
0.001
0.01
0.1
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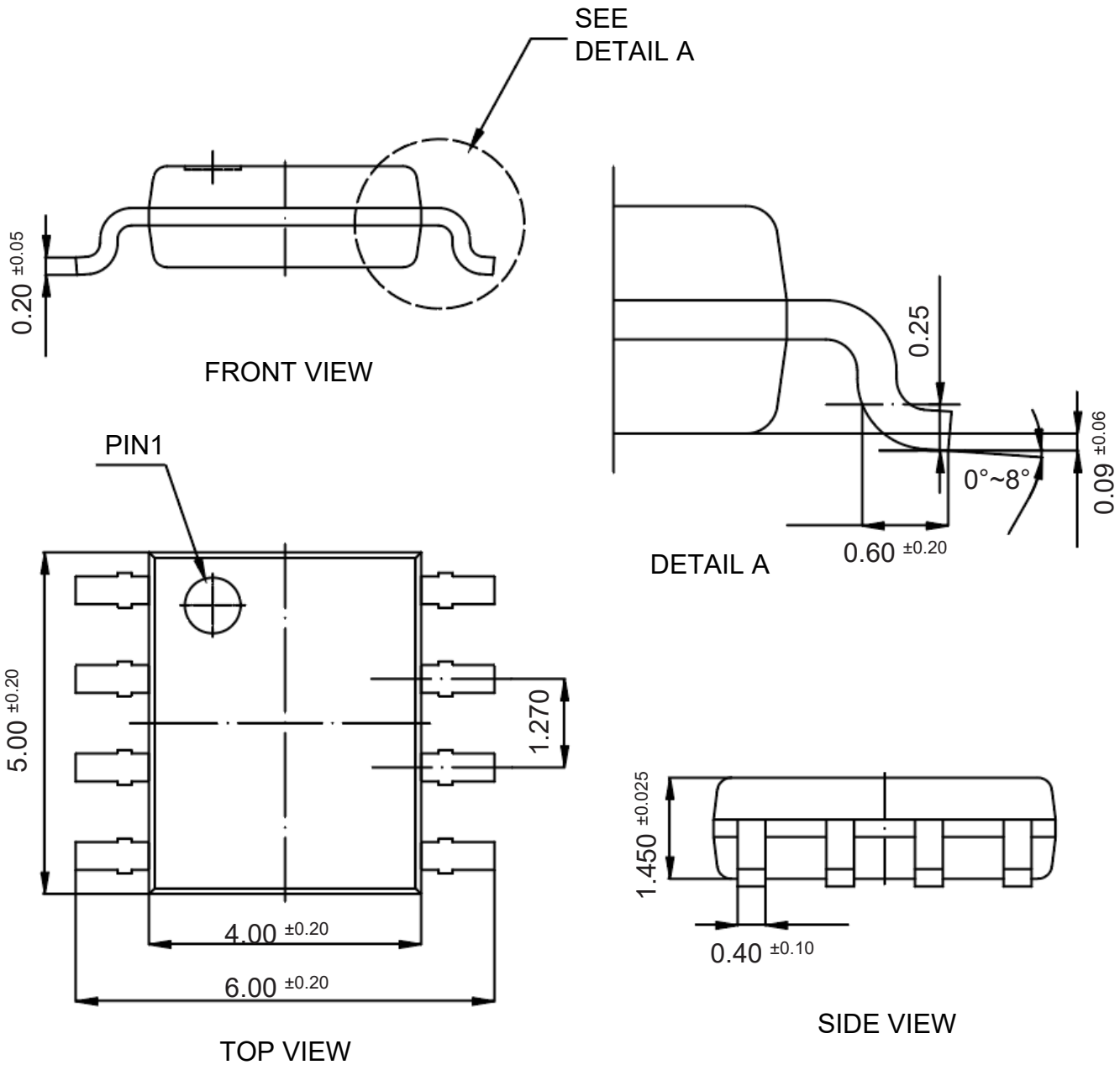
1000
In Descending Order
D=0.5, 0.3, 0.1, 0.05, 0.02, 0.01, Single Pulse
1.Duty Cycle, D=T_{on}/T
2.T_{JMax}-T_A=P_D*$Z_{\theta JA}$*$R_{\theta JA}$
Surface Mounted
P_D
T_{on}
T
Square Wave Pluse Duration(sec)

Package Outline

SOP-8

Dimensions in mm



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Device	Package	Shipping
PJM08C40PA	SOP-8	4,000PCS/Reel&13inches

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