



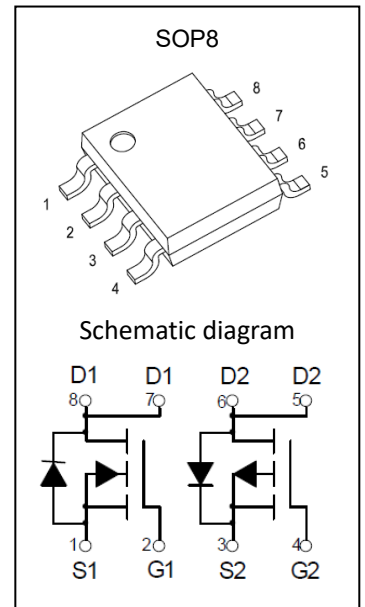
GP
ELECTRONICS

GP20NP45Q

20V N-Channel + P-Channel MOSFET

Product Summary

V _{(BR)DSS}	R _{DS(on)TYP}	I _D
-20V	29mΩ@-4.5V	-6A
	39mΩ@-2.5V	
	62mΩ@-1.8V	
20V	13mΩ@4.5V	10A
	16mΩ@2.5V	
	24mΩ@1.8V	



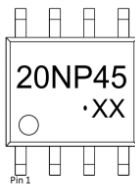
Feature

- Low drain-source ON-resistance
- High forward transfer admittance
- Low leakage current

Application

- Low voltage applications

MARKING:



20NP45 = Device Code

XX = Date Code

Solid dot = Green Device

ABSOLUTE MAXIMUM RATINGS (T_a=25°C unless otherwise noted)

Parameter	Symbol	Value	Unit
P-MOSFET			
Drain-Source Voltage	V _{DS}	-20	V
Gate-Source Voltage	V _{GS}	±12	V
Continuous Drain Current ⁽¹⁾	I _D	-6	A
Pulsed Drain Current	I _{DM}	-24	A
Power Dissipation	P _D	1.4	W
N-MOSFET			
Drain-Source Voltage	V _{DS}	20	V
Gate-Source Voltage	V _{GS}	±12	V
Continuous Drain Current	I _D	10	A
Pulsed Drain Current ⁽¹⁾	I _{DM}	40	A
Power Dissipation	P _D	1.4	W
Temperature and Thermal Resistance			
Thermal Resistance from Junction to Ambient ⁽²⁾	R _{θJA}	89	°C/W
Junction Temperature	T _J	150	°C
Storage Temperature	T _{STG}	-55~ +150	°C

P-channel MOSFET ELECTRICAL CHARACTERISTICS ($T_a=25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Static Characteristics						
Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = -250\mu A$	-20			V
Zero gate voltage drain current	I_{DSS}	$V_{DS} = -16V, V_{GS} = 0V$			-1	μA
Gate-body leakage current	I_{GSS}	$V_{GS} = \pm 12V, V_{DS} = 0V$			± 100	nA
Gate threshold voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250\mu A$	-0.4	-0.7	-1.0	V
Drain-source on-resistance ⁽³⁾	$R_{DS(on)}$	$V_{GS} = -4.5V, I_D = -3.0A$		29	38	m Ω
		$V_{GS} = -2.5V, I_D = -3.0A$		39	53	
		$V_{GS} = -1.8V, I_D = -2.0A$		62	83	
Forward transconductance	g_{FS}	$V_{DS} = -5V, I_D = -6.0A$	6			S
Diode forward voltage ⁽³⁾	V_{DS}	$I_S = -6.0A, V_{GS} = 0V$			-1.2	V
Dynamic characteristics⁽⁴⁾						
Input Capacitance	C_{iss}	$V_{DS} = -6V, V_{GS} = 0V, f = 1MHz$		715		pF
Output Capacitance	C_{oss}			170		
Reverse Transfer Capacitance	C_{rss}			120		
Total gate charge	Q_g	$V_{DS} = -6V, V_{GS} = -4.5V, I_D = -3.3A$			13	nC
Gate-source charge	Q_{gs}			1.2		
Gate-drain charge	Q_{gd}			1.6		
Switching Characteristics⁽⁴⁾						
Turn-on delay time	$t_{d(on)}$	$V_{GEN} = -4.5V, V_{DD} = -6V,$ $I_D = -1.0A, R_G = 6\Omega, R_L = 6\Omega$			25	nS
Turn-on rise time	t_r				55	
Turn-off delay time	$t_{d(off)}$				90	
Turn-off fall time	t_f				60	

N-channel MOSFET ELECTRICAL CHARACTERISTICS(T_a=25°C unless otherwise noted)

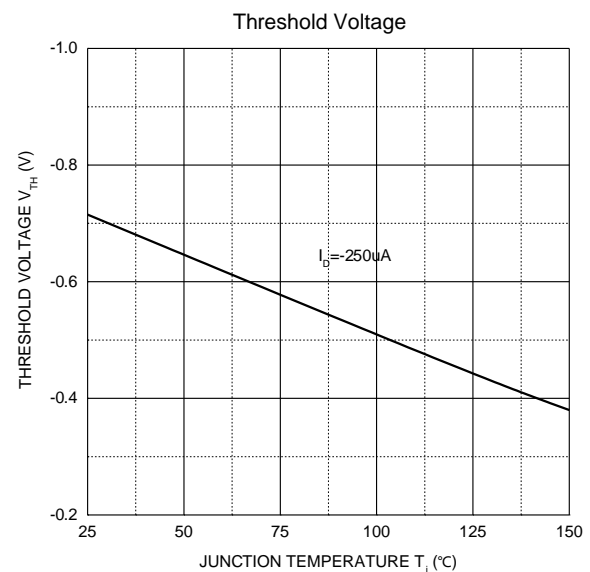
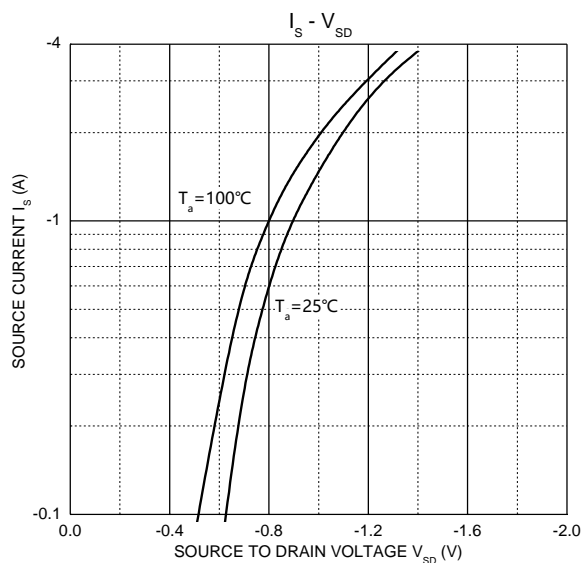
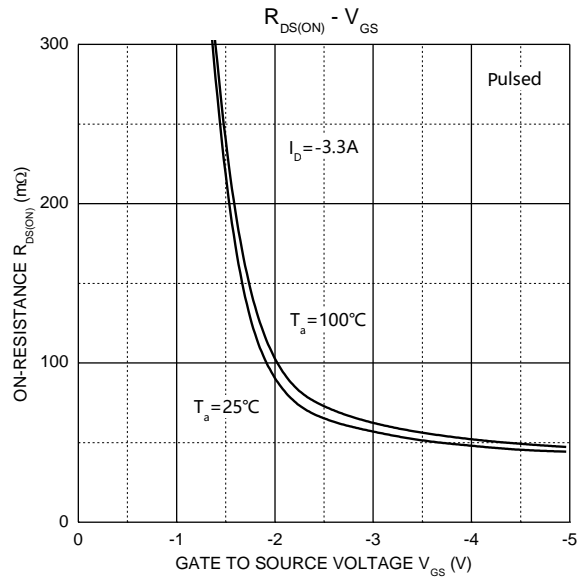
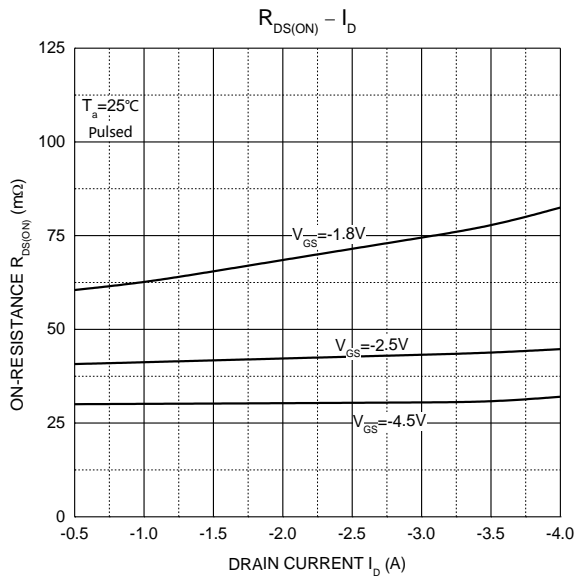
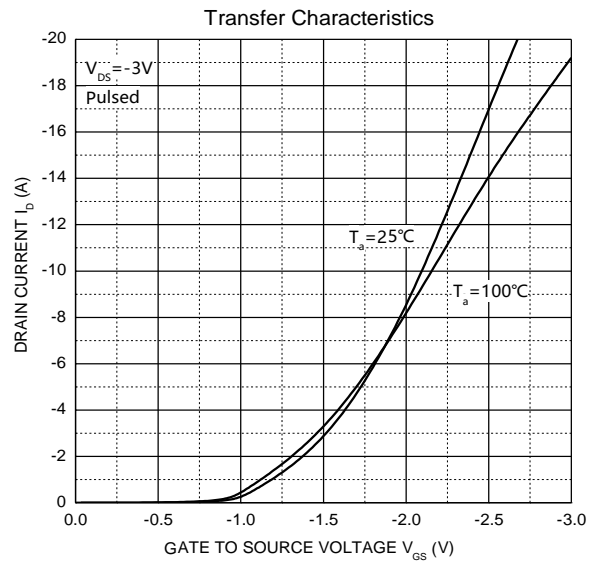
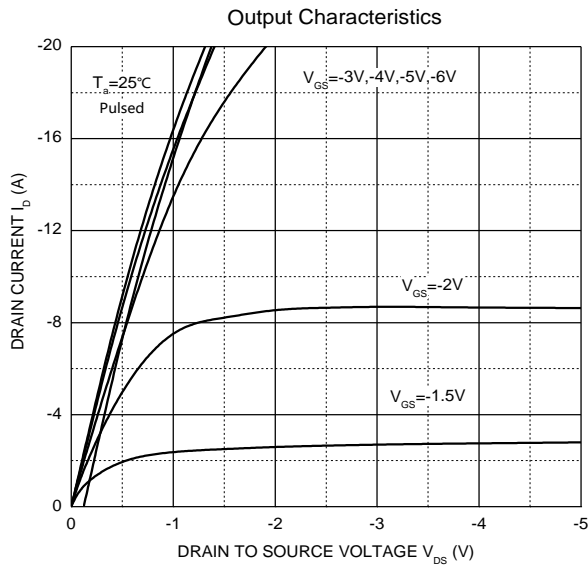
Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Static Characteristics						
Drain-source breakdown voltage	V _{(BR)DSS}	V _{GS} = 0V, I _D =250μA	20			V
Zero gate voltage drain current	I _{DSS}	V _{DS} =16V, V _{GS} = 0V			1	μA
Gate-body leakage current	I _{GSS}	V _{GS} =±12V, V _{DS} = 0V			±100	nA
Gate threshold voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	0.4	0.7	1	V
Drain-source on-resistance ⁽³⁾	R _{DS(on)}	V _{GS} =4.5V, I _D =5.0A		13	17	mΩ
		V _{GS} =2.5V, I _D =5.0A		16	25	
		V _{GS} =1.8V, I _D =4.0A		24	32	
Forward tranconductance	g _{FS}	V _{DS} =10V, I _D =5A	6			S
Diode Forward voltage ⁽³⁾	V _{DS}	I _S =10A, V _{GS} = 0V			1.2	V
Dynamic characteristics⁽⁴⁾						
Input Capacitance	C _{iss}	V _{DS} =10V, V _{GS} =0V, F=1.0MHz		865		pF
Output Capacitance	C _{oss}			105		
Reverse Transfer Capacitance	C _{rss}			55		
Total gate charge	Q _g	V _{DS} =10V, I _D =10A, V _{GS} =4.5V		12		nC
Gate-source charge	Q _{gs}			1.5		
Gate-drain charge	Q _{gd}			4.0		
Switching Characteristics⁽⁴⁾						
Turn-on delay time	t _{d(on)}	V _{GEN} =5V, V _{DD} =10V, I _D =4A, R _G =1Ω, R _L =2.2Ω			10	ns
Turn-on rise time	t _r				20	
Turn-off delay time	t _{d(off)}				32	
Turn-off fall time	t _f				12	

Notes:

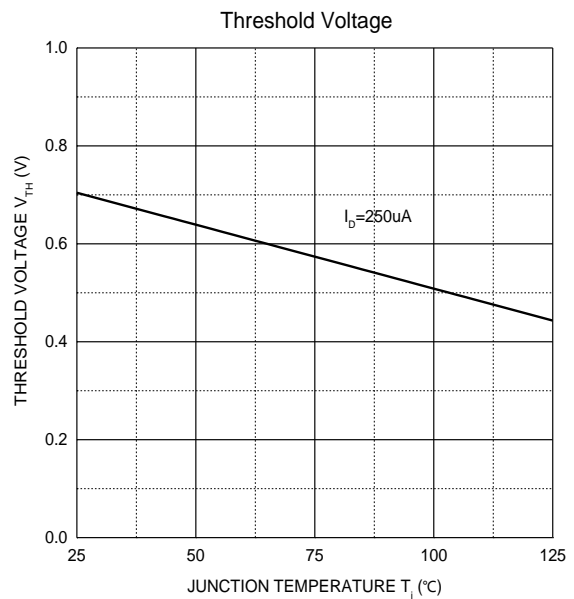
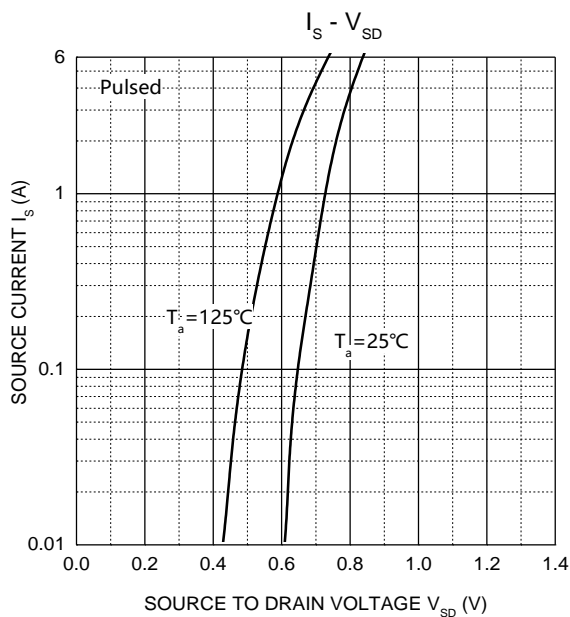
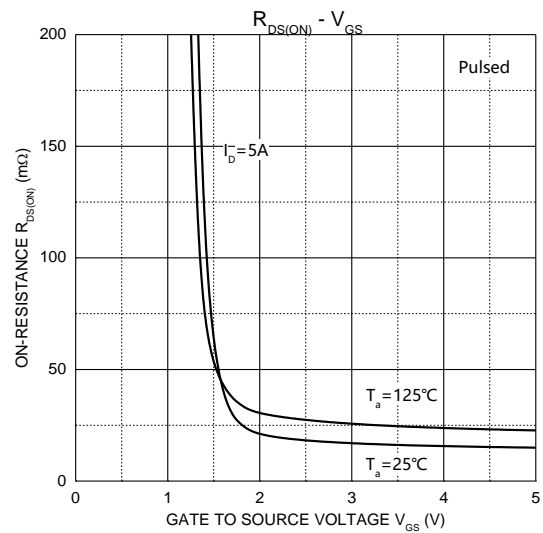
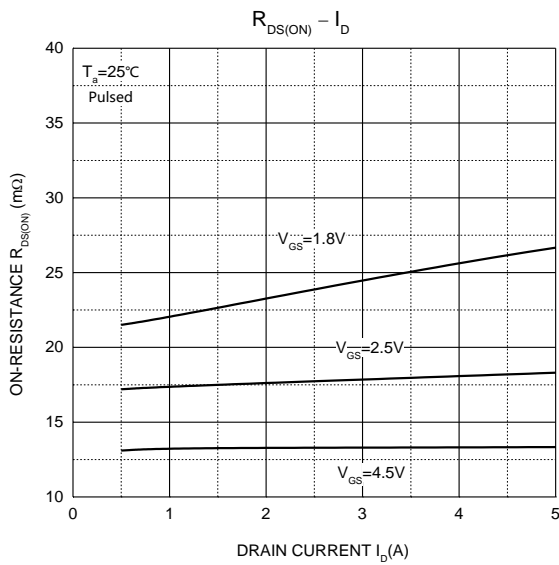
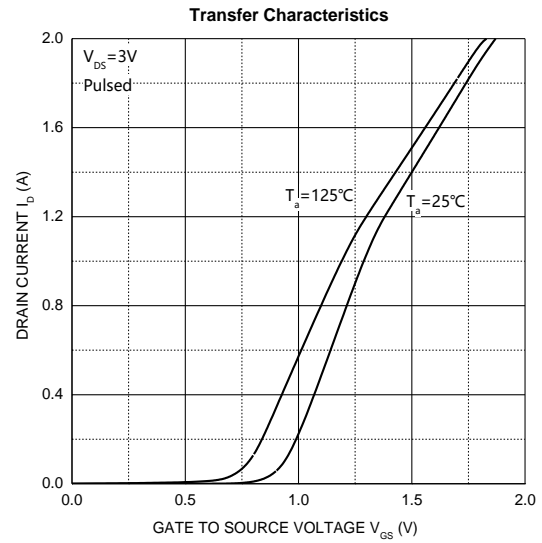
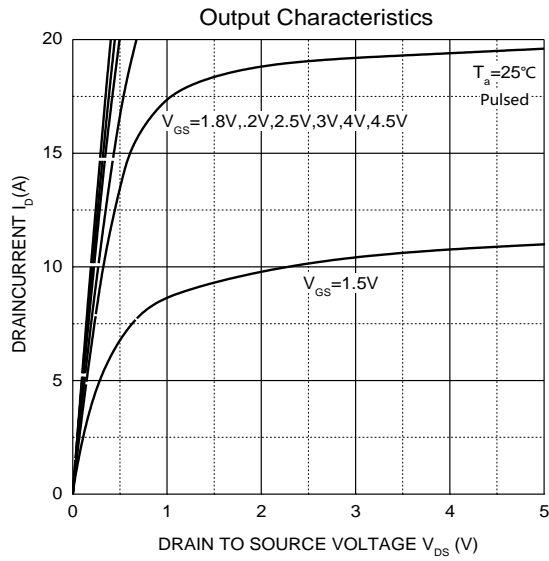
1. Repetitive Rating : Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, t < 5 sec.
3. Pulse Test : Pulse Width≤300μs, Duty Cycle ≤ 2%.
4. Guaranteed by design, not subject to production testing.

Typical Electrical and Thermal Characteristics

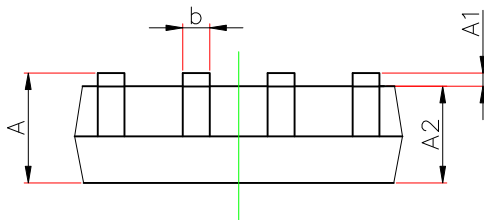
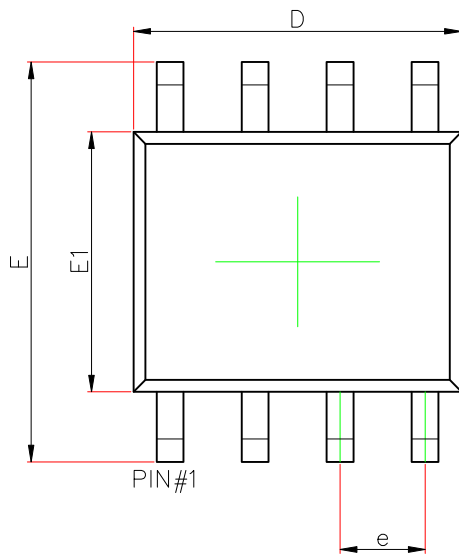
P-Channel MOS



N-Channel MOS



SOP8 Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.156	0.250	0.006	0.010
D	4.700	5.100	0.185	0.201
e	1.270(BSC)		0.050(BSC)	
E	5.800	6.200	0.228	0.244
E1	3.700	4.100	0.146	0.161
L	0.400	1.270	0.016	0.05
θ	0°	8°	0°	8°