

**Features**

- Advanced Trench MOSFET Process Technology
- Ultra Low On-Resistance with Low Gate Charge
- Epoxy Meets UL 94 V-0 Flammability Rating
- Moisture Sensitivity Level 1
- Halogen Free Available Upon Request By Adding Suffix "-HF"
- Lead Free Finish/RoHS Compliant ("P" Suffix Designates RoHS Compliant. See Ordering Information)

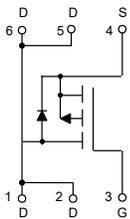
**Maximum Ratings**

- Operating Junction Temperature Range : -55°C to +150°C
- Storage Temperature Range: -55°C to +150°C
- Thermal Resistance: 556°C/W Junction to Ambient

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	$V_{DS}$	-12	V
Gate-Source Voltage	$V_{GS}$	$\pm 8$	V
Continuous Drain Current	$I_D$	-6	A
Pulsed Drain Current <sup>(Note 1)</sup>	$I_{DM}$	-20	A
Total Power Dissipation	$P_D$	350	mW

Note 1. Repetitive Rating: Pluse Width Limited by Junction Temperature.

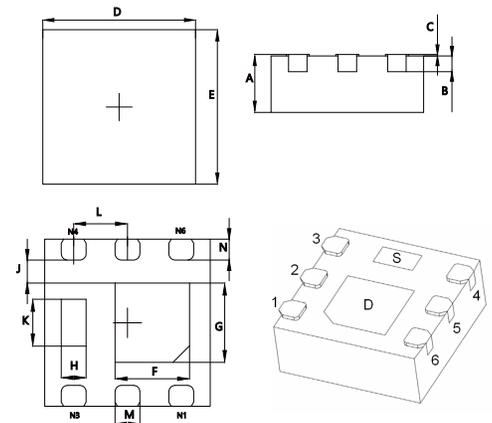
**Internal Structure**



**Marking: 1206**

**P-CHANNEL  
MOSFET**

**DFN2020-6J**



DIM	INCHES		MM		NOTE
	MIN	MAX	MIN	MAX	
A	0.028	0.032	0.700	0.800	
B	0.008		0.203		TYP.
C	0.000	0.002	0.000	0.050	
D	0.076	0.082	1.924	2.076	
E	0.076	0.082	1.924	2.076	
F	0.031	0.039	0.800	1.000	
G	0.033	0.041	0.850	1.050	
H	0.008	0.016	0.200	0.400	
J	0.008	----	0.200	----	
K	0.018	0.026	0.460	0.660	
L	0.026		0.650		TYP.
M	0.010	0.014	0.250	0.350	
N	0.007	0.013	0.174	0.326	

**Electrical Characteristics @ 25°C (Unless Otherwise Specified)**

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
<b>Static Characteristics</b>						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=-250\mu A$	-12			V
Gate-Source Leakage Current	$I_{GSS}$	$V_{DS}=0V, V_{GS}=\pm 8V$			$\pm 100$	nA
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=-50V, V_{GS}=0V$			-1	$\mu A$
Gate-Threshold Voltage <sup>(Note 2)</sup>	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-250\mu A$	-0.5		-0.9	V
Drain-Source On-Resistance <sup>(Note 2)</sup>	$R_{DS(on)}$	$V_{GS}=-4.5V, I_D=-3.5A$		30	45	m $\Omega$
		$V_{GS}=-2.5V, I_D=-3A$		40	60	
		$V_{GS}=-1.8V, I_D=-2A$		60	90	
Diode Forward Voltage	$V_{SD}$	$V_{GS}=0V, I_S=-3.3A$			-1.2	V
Forward Transconductance <sup>(Note 2)</sup>	$g_{FS}$	$V_{DS}=-5V, I_D=-4.1A$	6			S
<b>Dynamic Characteristics<sup>(Note 3)</sup></b>						
Input Capacitance	$C_{iss}$	$V_{DS}=-4V, V_{GS}=0V, f=1MHz$		740		pF
Output Capacitance	$C_{oss}$			290		
Reverse Transfer Capacitance	$C_{rss}$			190		
<b>Switching Characteristics<sup>(Note 3)</sup></b>						
Total Gate Charge	$Q_g$	$V_{DS}=-4V, V_{GS}=-4.5V, I_D=-4.1A$		7.8	15	nC
				4.5	9	
Gate-Source Charge	$Q_{gs}$	$V_{DS}=-4V, V_{GS}=-2.5V, I_D=-4.1A$		1.2		
Gate-Drain Charge	$Q_{gd}$			1.6		
Gate Resistance	$R_g$	$f=1MHz$	1.4	7	14	$\Omega$
Turn-On Delay Time	$t_{d(on)}$	$V_{DD}=-4V, R_L=1.2\Omega, I_D\approx-3.3A, V_{GEN}=-4.5V, R_g=1\Omega$		13	20	ns
Turn-On Rise Time	$t_r$			35	53	
Turn-Off Delay Time	$t_{d(off)}$			32	48	
Turn-Off Fall Time	$t_f$			10	20	
Turn-On Delay Time	$t_{d(on)}$	$V_{DD}=-4V, R_L=1.2\Omega, I_D\approx-3.3A, V_{GEN}=-8V, R_g=1\Omega$		5	10	
Turn-On Rise Time	$t_r$			11	17	
Turn-Off Delay Time	$t_{d(off)}$			22	33	
Turn-Off Fall Time	$t_f$			16	24	

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

3. Guaranteed by Design, Not Subject to Production Testing.

**Curve Characteristics**

Fig. 1 - Output Characteristics

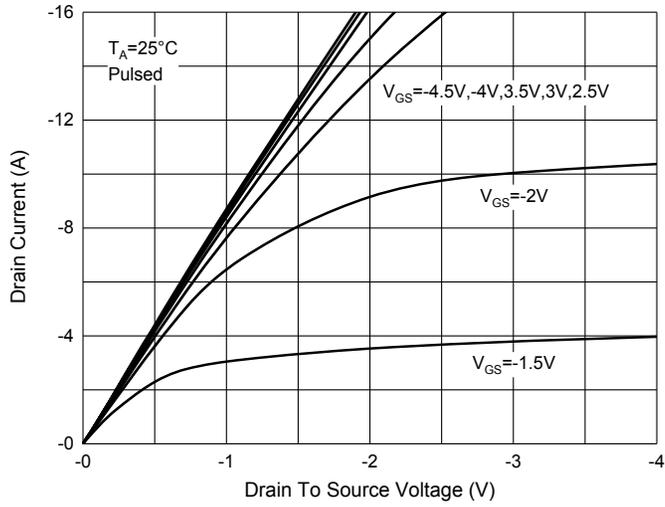


Fig. 2 - Transfer Characteristics

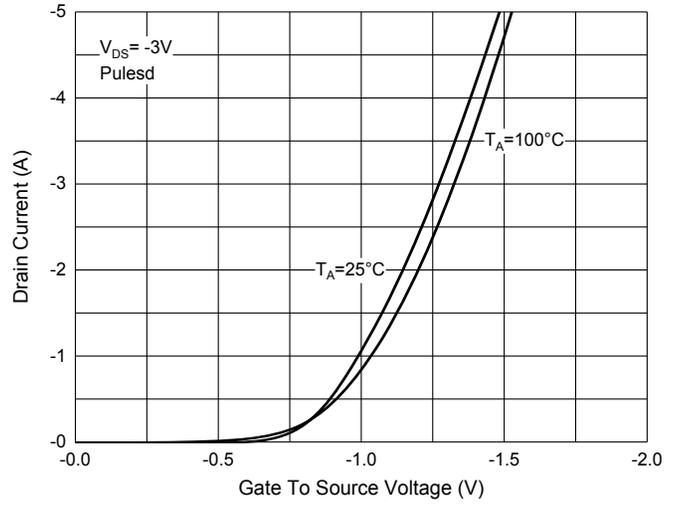


Fig. 3 -  $R_{DS(ON)} - I_D$

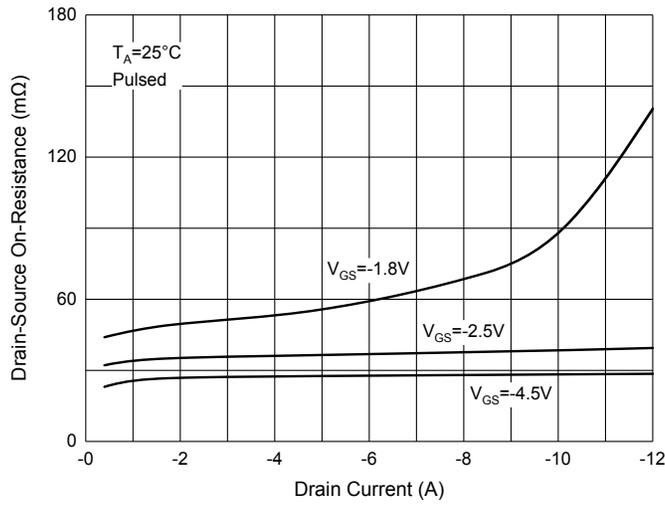


Fig. 4 -  $R_{DS(ON)} - V_{GS}$

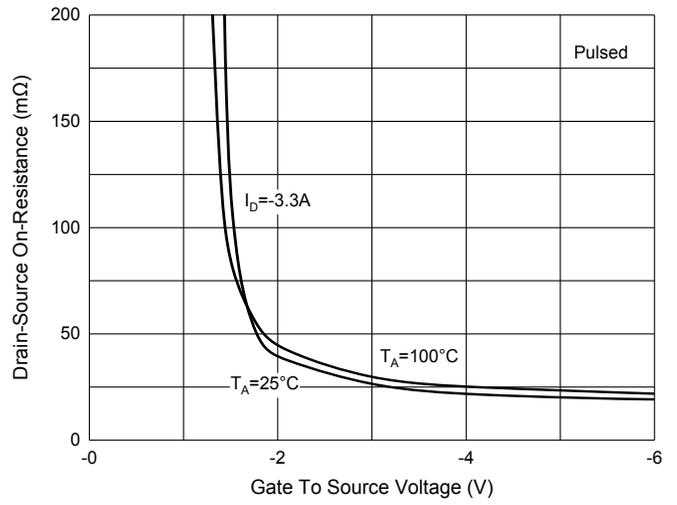


Fig. 5 -  $I_S - V_{SD}$

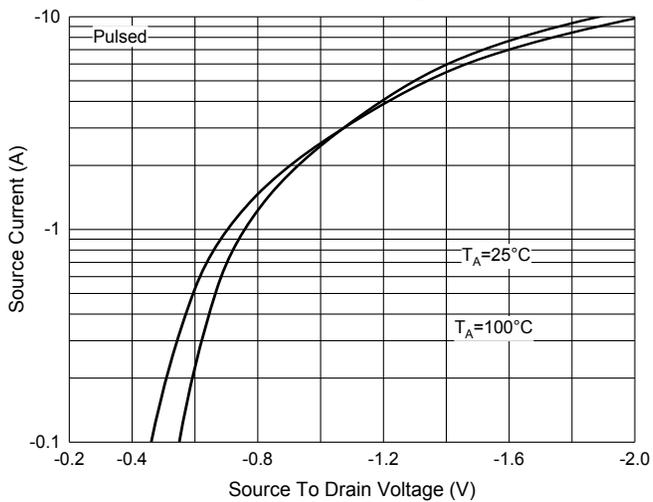
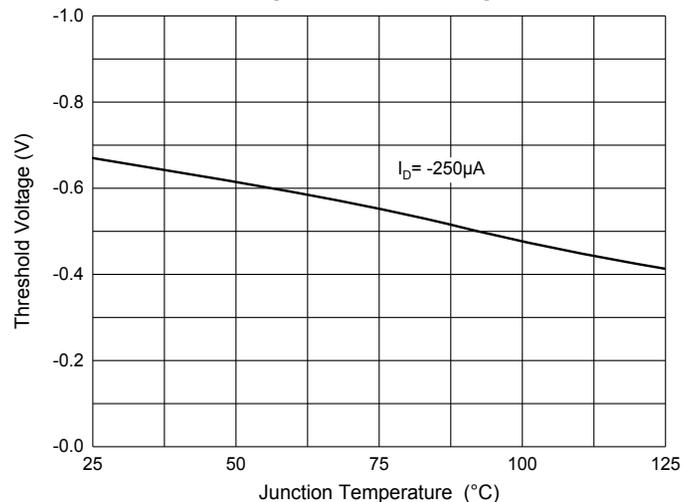


Fig. 6 - Threshold Voltage



## Ordering Information

Device	Packing
Part Number-TP	Tape&Reel: 3Kpcs/Reel

Note : Adding "-HF" Suffix for Halogen Free, eg. Part Number-TP-HF

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