

Features

- Trench FET Structure
- High Dense Cell Design for Extremely Low $R_{DS(ON)}$
- Epoxy Meets UL 94 V-0 Flammability Rating
- Halogen Free. "Green" Device (Note 1)
- Lead Free Finish/RoHS Compliant ("P" Suffix Designates RoHS Compliant. See Ordering Information)
- Moisture Sensitivity Level 1

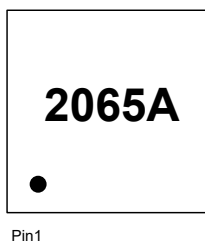
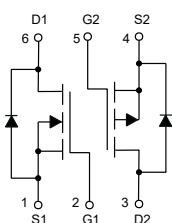
Maximum Ratings

- Operating Junction Temperature Range: -55°C to +150°C
- Storage Temperature Range: -55°C to +150°C
- Typical Thermal Resistance: 62.5°C/W Junction to Ambient(Note2)

Parameter	Symbol	Rating	Unit
N-Channel			
Drain-Source Voltage	V_{DS}	20	V
Gate-Source Voltage	V_{GS}	±10	V
Continuous Drain Current	I_D	$T_A=25^\circ\text{C}$	6
		$T_A=70^\circ\text{C}$	4.8
Pulsed Drain Current	I_{DM}	20	A
Total Power Dissipation	P_D	2	W
P-Channel			
Drain-Source Voltage	V_{DS}	-20	V
Gate-Source Voltage	V_{GS}	±10	V
Continuous Drain Current	I_D	$T_A=25^\circ\text{C}$	-4
		$T_A=70^\circ\text{C}$	-3.2
Pulsed Drain Current	I_{DM}	-16	A
Total Power Dissipation	P_D	2	W

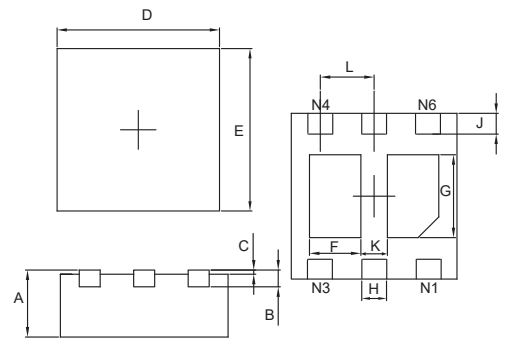
Note: 1. Halogen free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
2. Surface Mounted on 1 square inch of 2oz copper for FR4 Board.

Internal Structure and Marking Code



**Dual
N&P-Channel
MOSFET**

DFN2020-6L



DIM	DIMENSIONS				NOTE
	INCHES		MM		
	MIN	MAX	MIN	MAX	
A	0.030	0.034	0.750	0.850	
B	0.008		0.200		TYP.
C	0.000	0.002	0.000	0.050	
D	0.077	0.081	1.950	2.050	
E	0.077	0.081	1.950	2.050	
F	0.017	0.027	0.440	0.690	
G	0.033	0.043	0.840	1.090	
H	0.010	0.014	0.250	0.350	
J	0.007	0.015	0.175	0.375	
K	0.010	0.014	0.250	0.350	
L	0.026		0.650		TYP.

N-MOSFET ELECTRICAL CHARACTERISTICS (Ta=25°C unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu A$	20			V
Gate-Source Leakage Current	I_{GSS}	$V_{DS}=0V, V_{GS}=\pm 10V$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=20V, V_{GS}=0V$			1	μA
Gate-Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	0.4	0.6	1.0	V
Drain-Source On-Resistance ^(Note3)	$R_{DS(on)}$	$V_{GS}=4.5V, I_D=5A$		20	25	m Ω
		$V_{GS}=2.5V, I_D=4A$		25	32	m Ω
		$V_{GS}=1.8V, I_D=2A$		33	49	m Ω
Diode Characteristics						
Diode Forward Voltage ^(Note3)	V_{SD}	$V_{GS}=0V, I_S=5A$			1.2	V
Reverse Recovery Time	t_{rr}	$I_{SD}=4.5 A, dI_{SD}/dt=100A/\mu s$		17.9		nS
Reverse Recovery Charge	Q_{rr}			1.38		nC
Dynamic Characteristics^(Note4)						
Input Capacitance	C_{iss}	$V_{DS}=10V, V_{GS}=0V, f=1MHz$		418		pF
Output Capacitance	C_{oss}			82		
Reverse Transfer Capacitance	C_{rss}			70		
Total Gate Charge	Q_g	$V_{GS}=4.5V, V_{DS}=10V, I_D=4.5A$		7.65		nC
Gate-Source Charge	Q_{gs}			1.16		
Gate-Drain Charge	Q_{gd}			1.89		
Turn-On Delay Time	$t_{d(on)}$	$V_{GS}=4.5V, V_{DS}=10V,$ $R_{GEN}=6\Omega, I_D=1A$		6.5		ns
Turn-On Rise Time	t_r			21		
Turn-Off Delay Time	$t_{d(off)}$			28.4		
Turn-Off Fall Time	t_f			26.3		

P-MOSFET ELECTRICAL CHARACTERISTICS (Ta=25°C unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=-250\mu A$	-20			V
Gate-Source Leakage Current	I_{GSS}	$V_{DS}=0V, V_{GS}=\pm 10V$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=-20V, V_{GS}=0V$			-1	μA
Gate-Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-250\mu A$	-0.4	-0.7	-1	V
Drain-Source On-Resistance ^(Note3)	$R_{DS(on)}$	$V_{GS}=-4.5V, I_D=-3.4A$		44	51	m Ω
		$V_{GS}=-2.5V, I_D=-3A$		60	67	m Ω
		$V_{GS}=-1.8V, I_D=-2.5A$		94	100	m Ω
Diode Characteristics						
Diode Forward Voltage ^(Note3)	V_{SD}	$V_{GS}=0V, I_S=-3.4A$			-1.2	V
Reverse Recovery Time	t_{rr}	$I_{SD}=-3.7A, dI_{SD}/dt=100A/\mu s$		24.5		nS
Reverse Recovery Charge	Q_{rr}			4		nC
Dynamic Characteristics^(Note4)						
Input Capacitance	C_{iss}	$V_{DS}=-6V, V_{GS}=0V, f=1MHz$		880		pF
Output Capacitance	C_{oss}			270		
Reverse Transfer Capacitance	C_{rss}			175		
Total Gate Charge	Q_g	$V_{GS}=-10V, V_{DS}=-10V, I_D=-3.7A$		5.41		nC
Gate-Source Charge	Q_{gs}			1.17		
Gate-Drain Charge	Q_{gd}			1.24		
Turn-On Delay Time	$t_{d(on)}$	$V_{GS}=-4.5V, V_{DS}=-10V, R_{GEN}=6\Omega, I_D=-1A$		7		ns
Turn-On Rise Time	t_r			21.4		
Turn-Off Delay Time	$t_{d(off)}$			46		
Turn-Off Fall Time	t_f			34.8		

Notes:

 3.Pulse Test: Pulse Width $\leq 300\mu A$, Duty Cycles $\leq 2\%$.

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

N-MOSFET Curve Characteristics

Fig. 1 - Output Characteristics

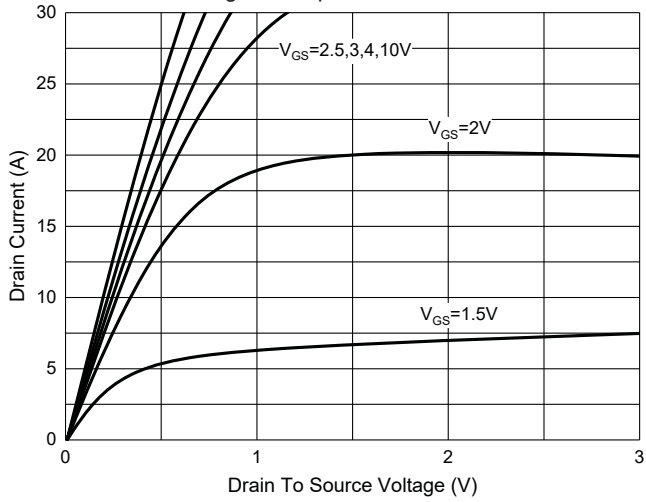


Fig. 2 - Transfer Characteristics

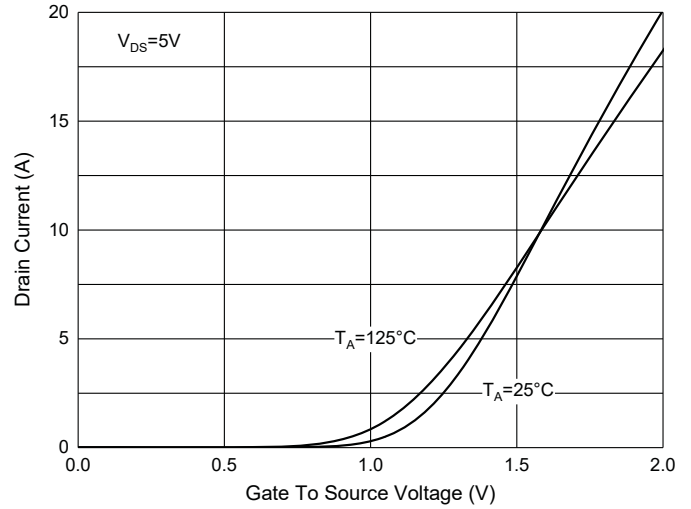


Fig. 3 - Normalized On Resistance Characteristics

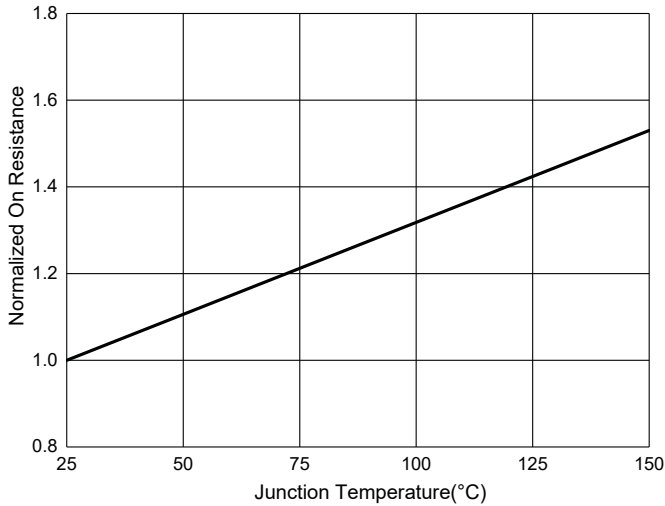


Fig. 4 - Gate Charge

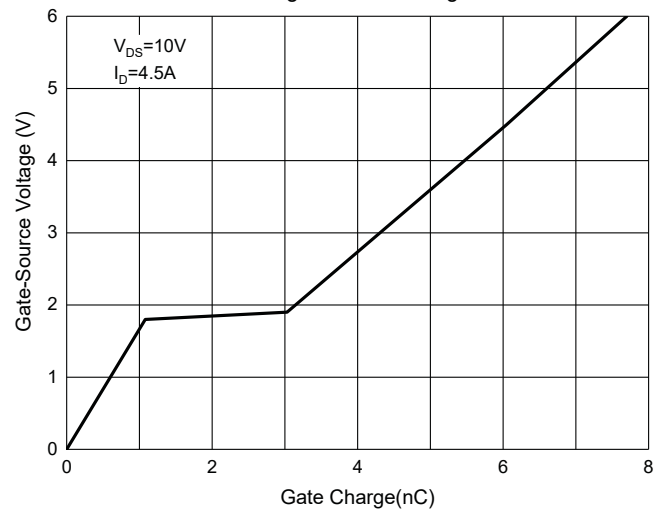


Fig. 5 - Capacitance Characteristics

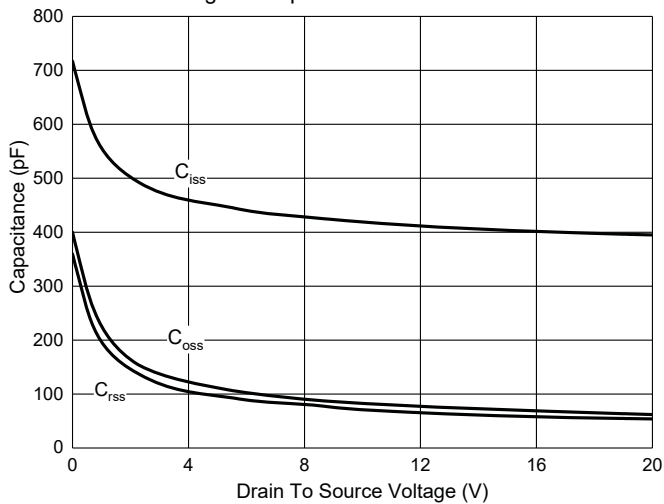
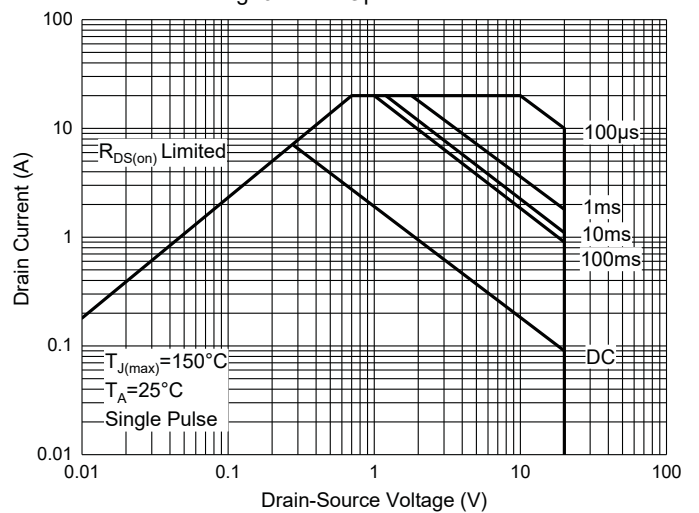


Fig. 6 - Safe Operation Area



Curve Characteristics

Fig. 1 - Output Characteristics

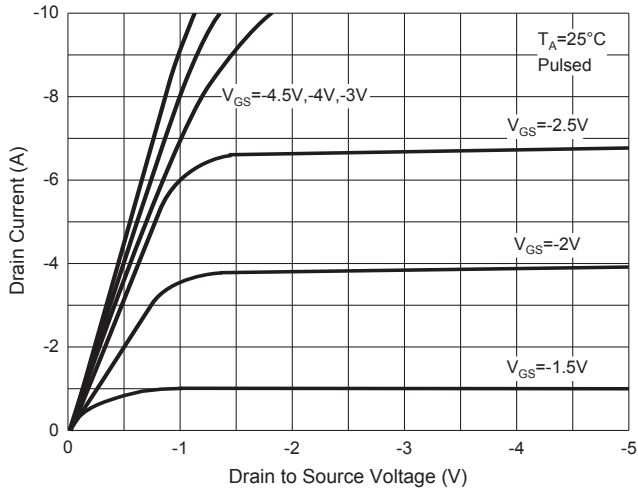


Fig. 2 - Transfer Characteristics

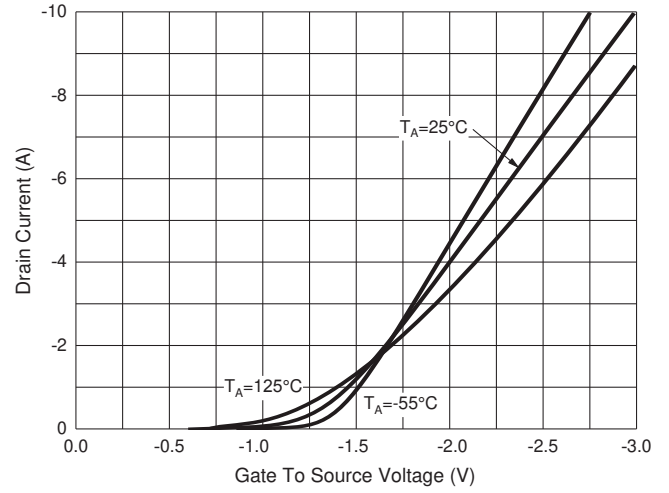


Fig. 3 - Capacitance Characteristics

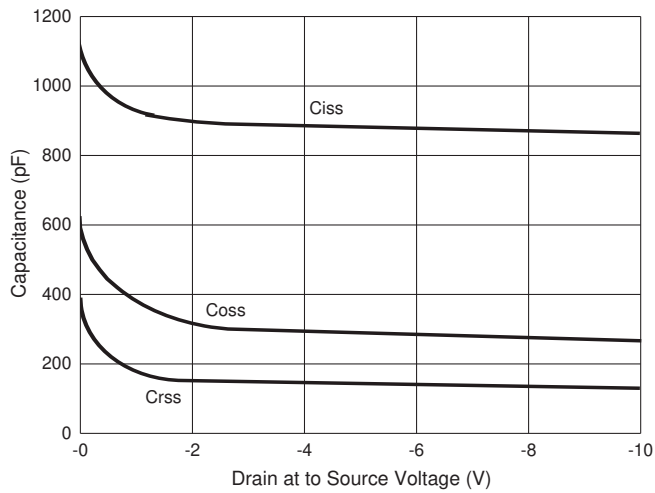


Fig. 4 - $R_{DS(ON)}$ —Temperature

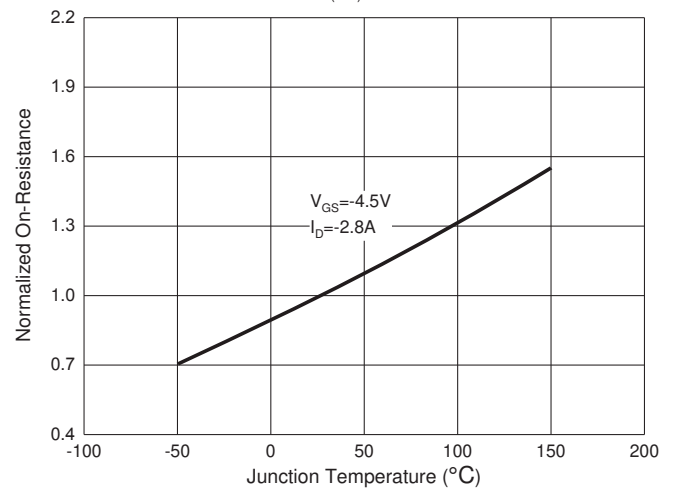


Fig. 5 - Threshold Voltage

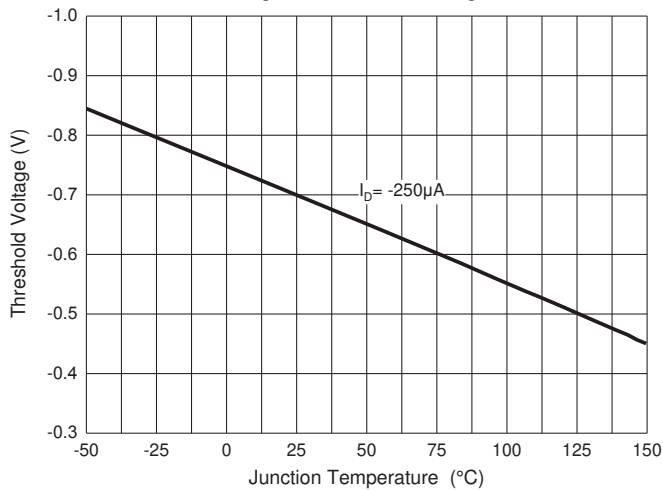
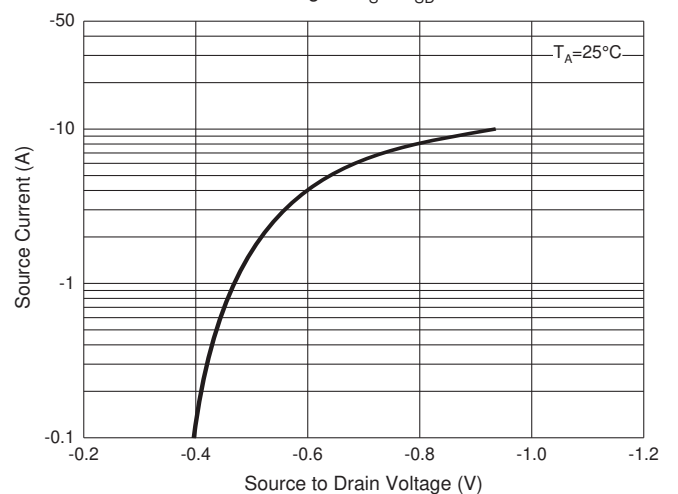


Fig. 6 - I_S — V_{SD}



Ordering Information

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

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