

## Features

- AEC-Q101 Qualified
- Trench FET Power MOSFET
- Halogen Free (Note1)
- Moisture Sensitivity Level 3
- Epoxy Meets UL 94 V-0 Flammability Rating
- Lead Free Finish/RoHS Compliant ("P" Suffix Designates RoHS Compliant. See Ordering Information)

## Maximum Ratings

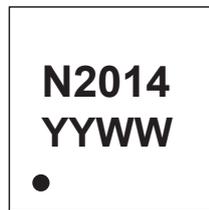
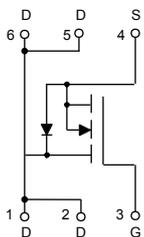
- Operating Junction Temperature Range : -55°C to +150°C
- Storage Temperature Range: -55°C to +150°C
- Thermal Resistance: 167°C/W Junction to Ambient (Note2)

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	$V_{DS}$	12	V
Gate-Source Voltage	$V_{GS}$	±8	V
Continuous Drain Current	$I_D$	15	A
Pulsed Drain Current (Note3)	$I_{DM}$	60	A
Single Pulsed Avalanche Energy ( $L=0.5mH$ )	$E_{AS}$	25	mJ

### Notes:

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 FR4 Board Using The Minimum Pad Size, 1oz Copper.
3. Surface Mounted On FR4 Board Using 1 Square Inch Pad Size, 1oz Copper.

## Internal Structure and Marking Code

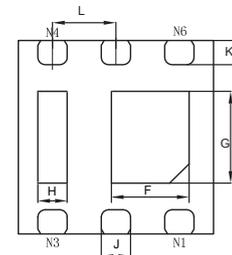
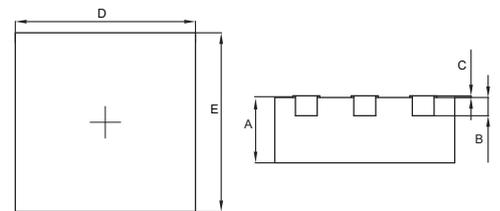


Pin1

YYWW: 4 codes in total  
YY is the year  
WW is the cycle

# N-Channel MOSFET

## DFN2020-6LE



DIM	DIMENSIONS				NOTE
	INCHES		MM		
	MIN	MAX	MIN	MAX	
A	0.030	0.033	0.750	0.850	
B	0.008		0.200		REF.
C	0.000	0.002	0.000	0.050	
D	0.075	0.083	1.900	2.100	
E	0.075	0.083	1.900	2.100	
F	0.024	0.031	0.610	0.810	
G	0.028	0.036	0.710	0.910	
H	0.008	0.016	0.200	0.400	
J	0.010	0.014	0.250	0.350	
K	0.008	0.012	0.200	0.300	
L	0.026		0.650		TYP.

**ELECTRICAL CHARACTERISTICS (Ta=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-Threshold Voltage <sup>(Note 4)</sup>	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	0.40	0.7	1.1	V
Gate-Body Leakage Current	$I_{GSS}$	$V_{GS} = \pm 8V, V_{DS} = 0V$			$\pm 100$	nA
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = 12V, V_{GS} = 0V$			1	$\mu A$
Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=8V, I_D=5A$		5	8	m $\Omega$
		$V_{GS}=4.5V, I_D=5A$		7	9	
		$V_{GS}=2.5V, I_D=5A$		9	11	
Forward Transconductance <sup>(Note 4)</sup>	$g_{FS}$	$V_{DS}=6V, I_D=5A$		40		S
Diode Forward Voltage	$V_{SD}$	$V_{GS}=0V, I_S=10A$			1.2	V
<b>Dynamic Characteristics<sup>(Note 5)</sup></b>						
Input Capacitance	$C_{iss}$	$V_{DS}=10V, V_{GS}=0V, f=1MHz$		1791		pF
Output Capacitance	$C_{oss}$			229		
Reverse Transfer Capacitance	$C_{riss}$			197		
Gate Resistance	$R_g$	$f=1MHz$		11		$\Omega$
<b>Switching Characteristics<sup>(Note 5)</sup></b>						
Turn-On Delay Time	$t_{d(on)}$	$V_{DD}=10V, V_{GEN}=8V, I_D=10A, R_G=4.5\Omega, R_L=1\Omega$		6.5		ns
Turn-On Rise Time	$t_r$			42		
Turn-Off Delay Time	$t_{d(off)}$			56		
Turn-Off Fall Time	$t_f$			32		
Total Gate Charge	$Q_g$	$V_{DS}=10V, V_{gs}=8V, I_D=10A$		48		nC
Gate-Source Charge	$Q_{gs}$			5.2		
Gate-Drain Charge	$Q_{gd}$			4.6		

Notes:

 4. Pulse Test: Pulse Width $\leq 300\mu s$ , Duty Cycles $\leq 2\%$ .

5. These Parameters Have No Way To Verify.

Curve Characteristics

Fig. 1 - Typical Output Characteristics

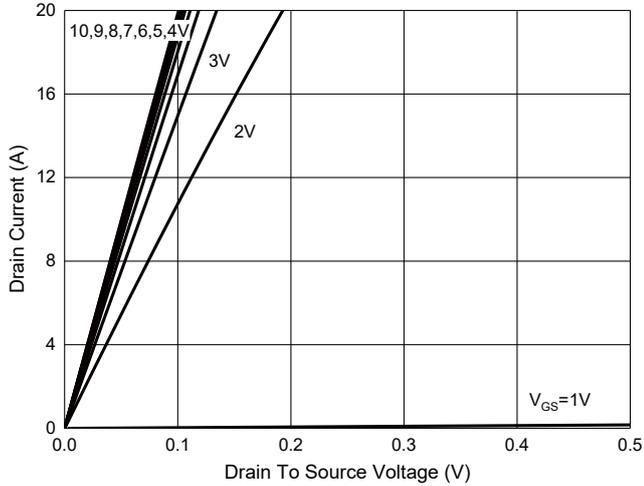


Fig. 2 - I<sub>S</sub>—V<sub>SD</sub>

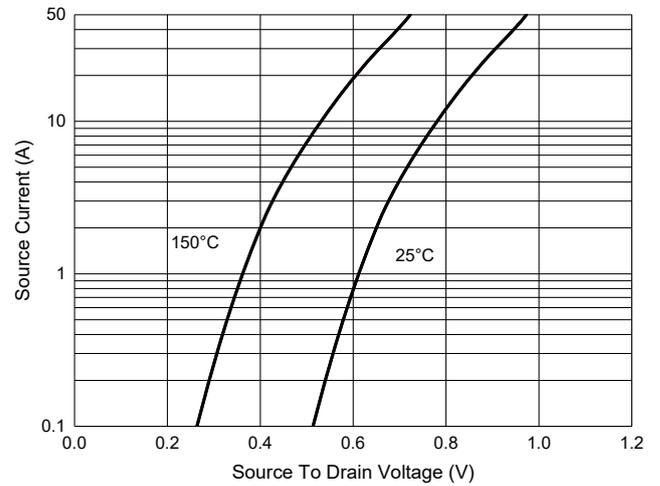


Fig. 3 - R<sub>DS(ON)</sub>—I<sub>D</sub>

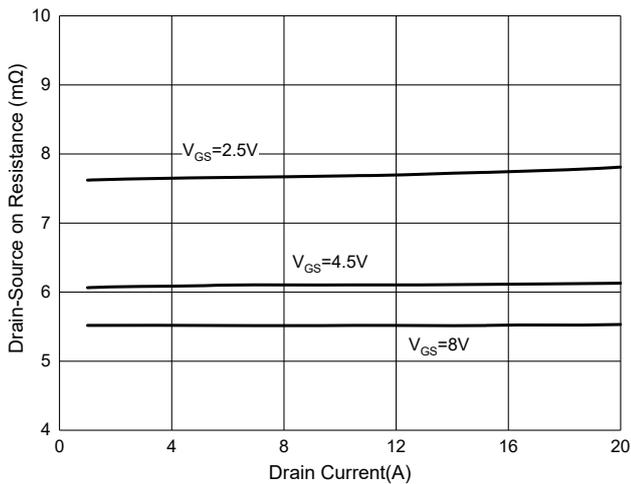


Fig. 4 - Normalized On Resistance Characteristics

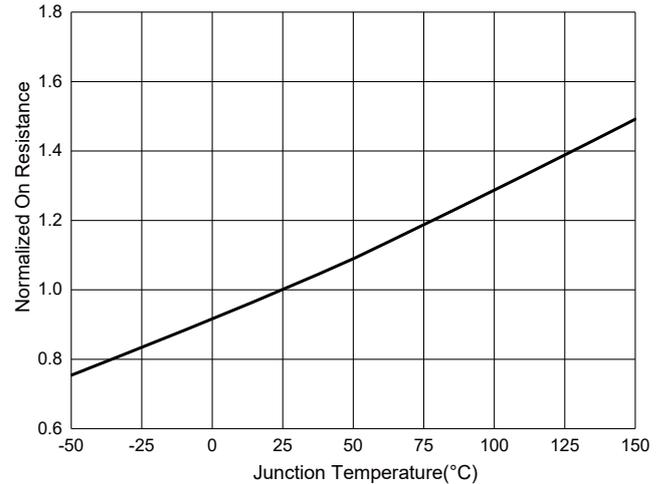


Fig. 5 - Capacitance Characteristics

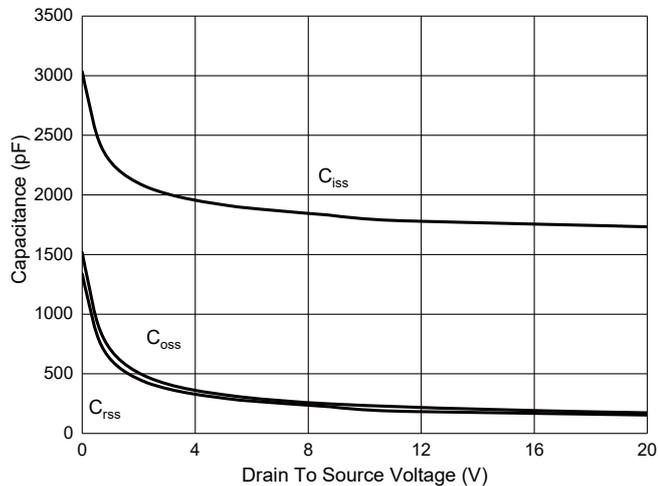
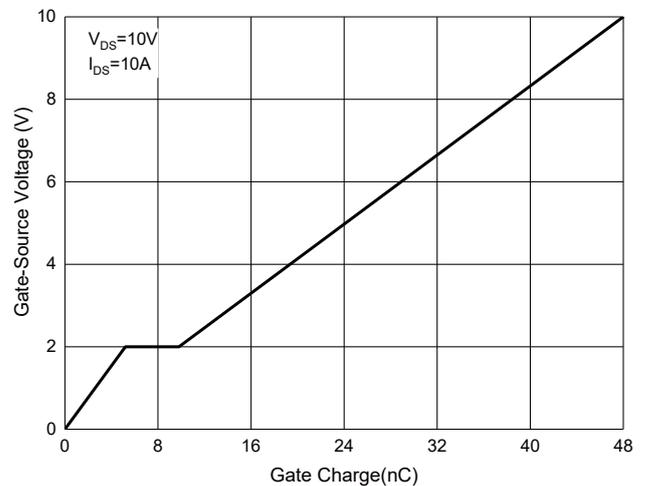
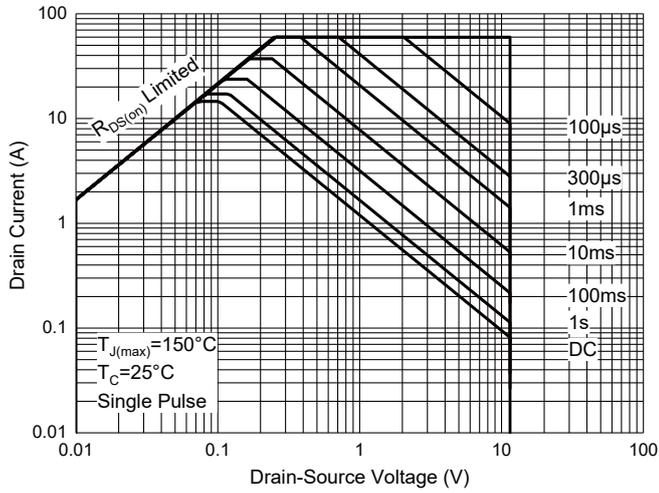


Fig. 6 - Gate Charge



Curve Characteristics

Fig. 7 - Safe Operation Area



## Ordering Information

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

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