

Features

- AEC-Q101 Qualified
- Trench LV MOSFET Technology
- Moisture Sensitivity Level 1
- Halogen Free. "Green" Device^(Note1)
- Epoxy Meets UL 94 V-0 Flammability Rating
- Lead Free Finish/RoHS Compliant ("P" Suffix Designates RoHS Compliant. See Ordering Information)

Maximum Ratings

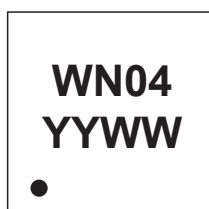
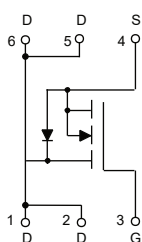
- Operating Junction Temperature Range : -55°C to +150°C
- Storage Temperature Range: -55°C to +150°C
- Thermal Resistance: 80°C/W Junction to Ambient^(Note2)
- Thermal Resistance: 4.4°C/W Junction to Case

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	40	V
Gate-Source Voltage ^(Note 3)	V_{GS}	+20/-16V	V
Continuous Drain Current	I_D	33	A
		21	
		$T_C=25^{\circ}\text{C}$	
		$T_C=100^{\circ}\text{C}$	
Pulsed Drain Current ^(Note 4)	I_{DM}	132	A
Total Power Dissipation ^(Note 5)	P_D	28	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. The value of $R_{\theta JA}$ is measured with the device mounted on 1in² FR-4 board with 2oz. Copper, in a still air environment with $T_A=25^{\circ}\text{C}$.
3. $V_{GS}=+20\text{V}/-16\text{V}$ according AEC-Q101 at $T_J=150^{\circ}\text{C}$
4. Repetitive rating; pulse width limited by max. junction temperature.
5. P_D is based on max. junction temperature, using junction-case thermal resistance.

Internal Structure and Marking Code

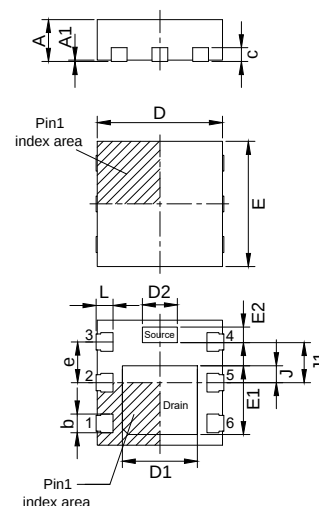


Pin1

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

N-CHANNEL MOSFET

DFN2020-6(SWF)



DIM	INCH		MM		NOTE
	MIN	MAX	MIN	MAX	
A	0.019	0.034	0.50	0.85	
A1	0.000	0.004	0.00	0.10	
c	0.008		0.20		TYP
D	0.074	0.083	1.90	2.10	
E	0.074	0.083	1.90	2.10	
D1	0.043	0.052	1.10	1.30	
E1	0.039	0.048	1.00	1.20	
D2	0.018	0.026	0.46	0.66	
E2	0.005	0.014	0.15	0.35	
J	0.011		0.27		TYP
J1	0.025		0.64		TYP
b	0.007	0.016	0.20	0.40	
e	0.026		0.65		TYP
L	0.005	0.014	0.15	0.35	

N-Channel MOSFET Electrical Characteristics @ 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 =250μA	40			V
Gate-Source Leakage Current	I _{GSS}	V _{DS} =0V, V _{GS} =±20V			±100	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =40V, V _{GS} =0V			1	μA
Gate-Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	1.0	1.7	2.5	V
Drain-Source On-Resistance	R _{DS(on)}	V _{GS} =10V, I _D =9A		10	13	mΩ
		V _{GS} =4.5V, I _D =8.5A		14	18	
Gate Resistance	R _g	f=1MHz, Open Drain		2.3		Ω
Diode Characteristics						
Continuous Body Diode Current	I _S				33	A
Diode Forward Voltage	V _{SD}	V _{GS} =0V, I _S =10A			1.2	V
Reverse Recovery Time	t _{rr}	I _S =10A, dI _F /dt=100A/μs		13.2		ns
Reverse Recovery Charge	Q _{rr}			8.0		nC
Dynamic Characteristics						
Input Capacitance	C _{iss}	V _{DS} =20V, V _{GS} =0V, f=1MHz		997		pF
Output Capacitance	C _{oss}			96		
Reverse Transfer Capacitance	C _{rss}			84		
Total Gate Charge	Q _g	V _{DS} =20V, V _{GS} =10V, I _D =9A		22		nC
Gate-Source Charge	Q _{gs}			3.2		
Gate-Drain Charge	Q _{gd}			5		
Turn-On Delay Time	t _{d(on)}	V _{GS} =10V, V _{DD} =20V, I _D =9A, R _G =3Ω		7.8		ns
Turn-On Rise Time	t _r			3.8		
Turn-Off Delay Time	t _{d(off)}			25		
Turn-Off Fall Time	t _f			5.4		

Curve Characteristics

Fig.1 - Typical Output Characteristics

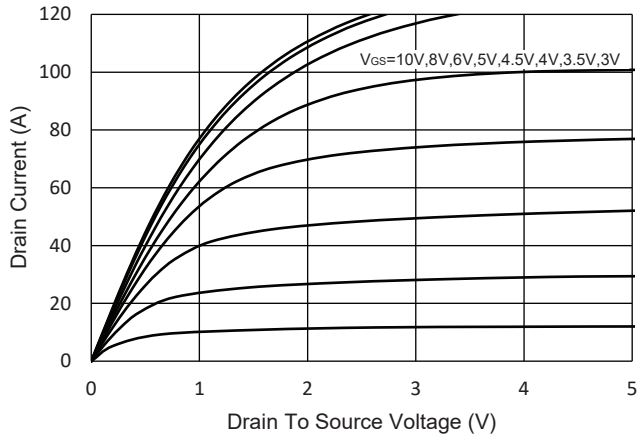


Fig.2 - Transfer Characteristics

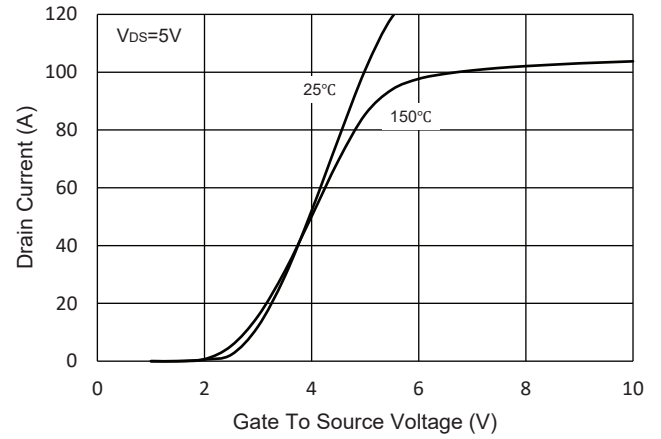


Fig.3 - $R_{DS(ON)}$ - V_{GS}

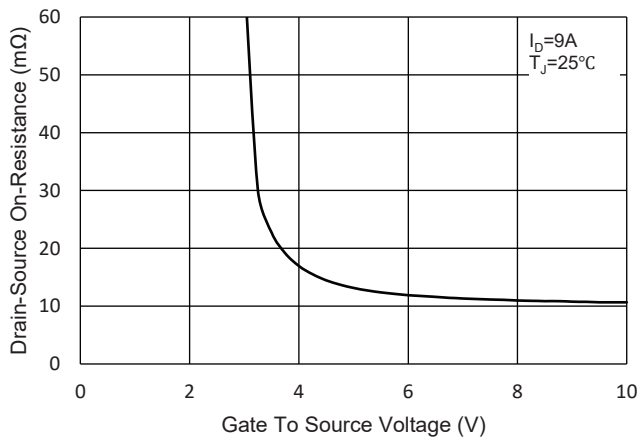


Fig.4 - $R_{DS(ON)}$ - I_D

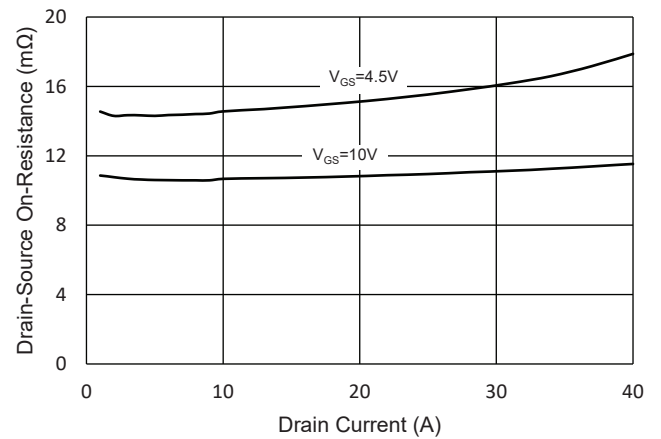


Fig.5 - Capacitance Characteristics

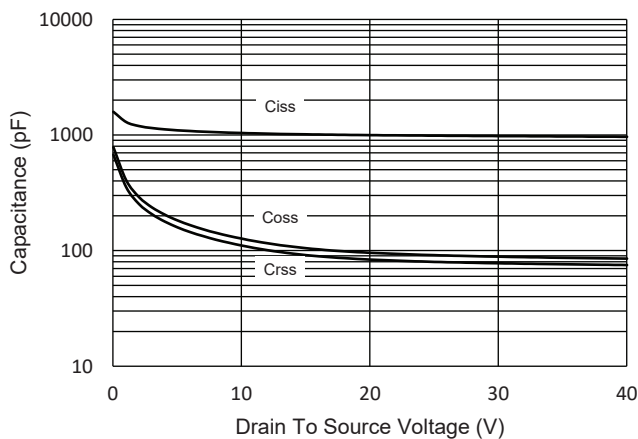
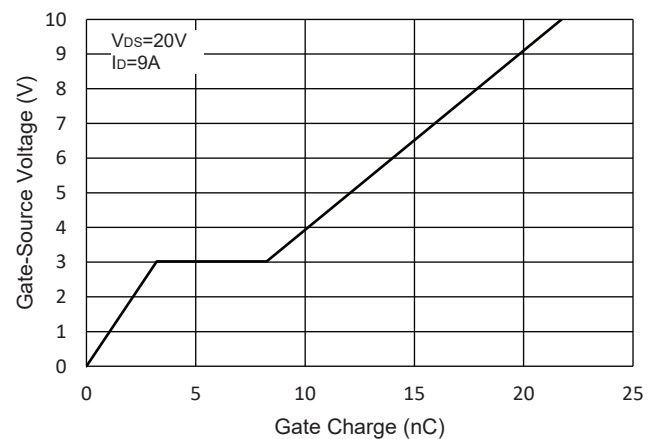


Fig.6 - Gate Charge



Curve Characteristics

Fig.7 - Normalized Threshold Voltage

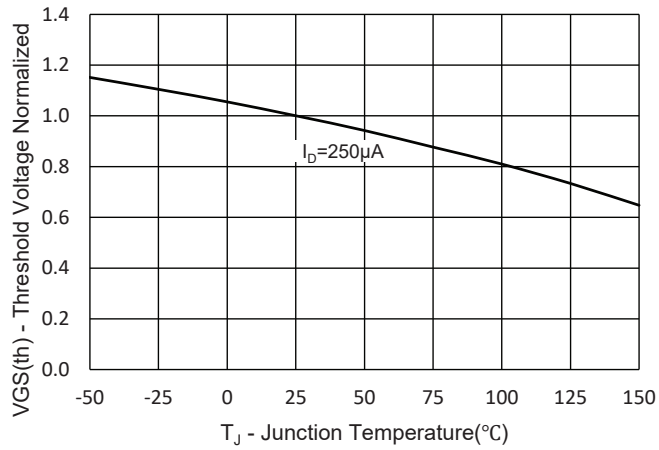


Fig.8 - Normalized On Resistance Characteristics

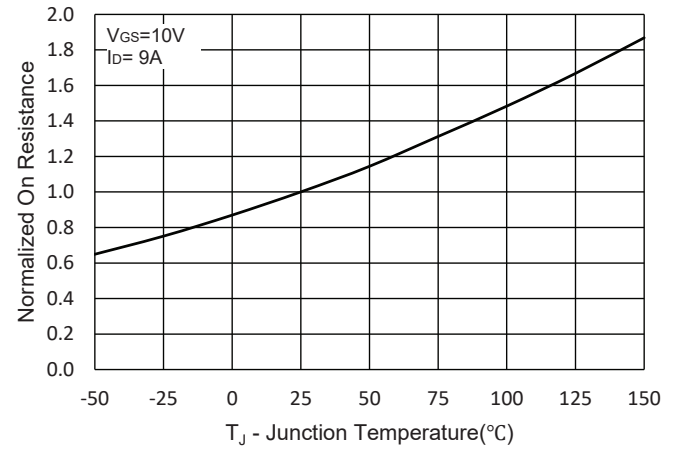


Fig.9 - $I_S - V_{SD}$

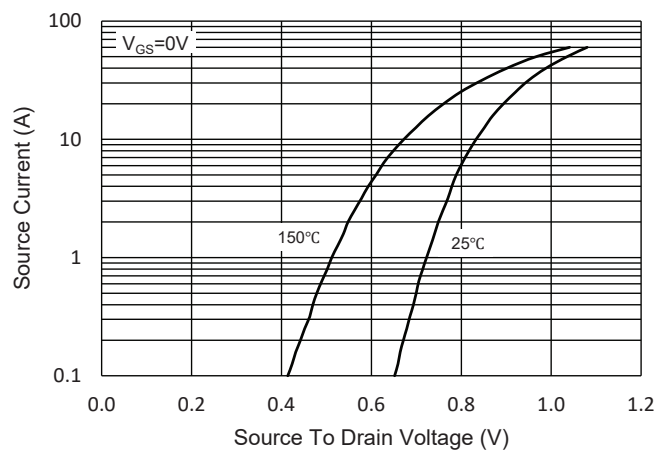


Fig. 10 - Drain Current

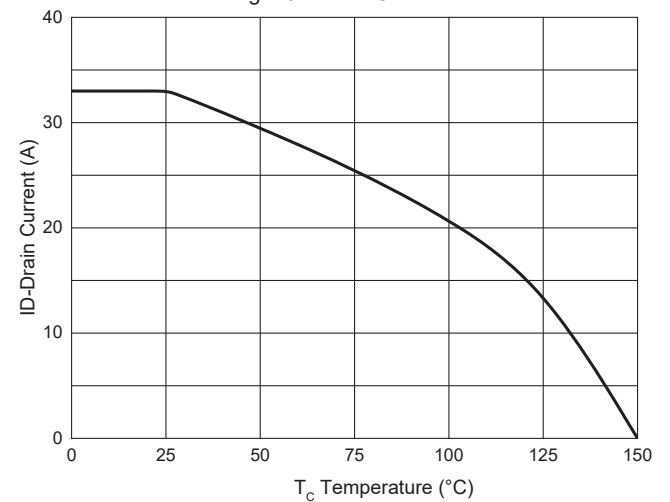
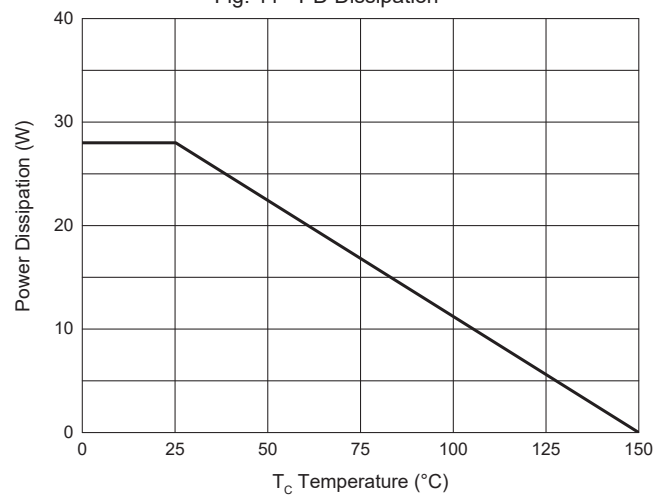


Fig. 11 - PD Dissipation



Curve Characteristics

Fig. 12 - Safe Operation Area

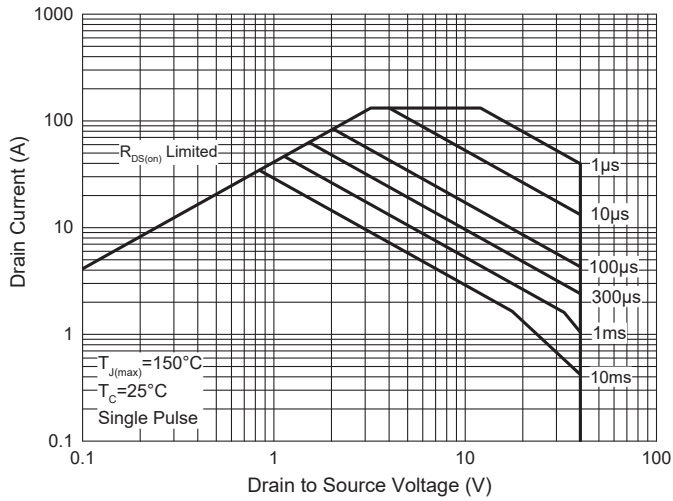
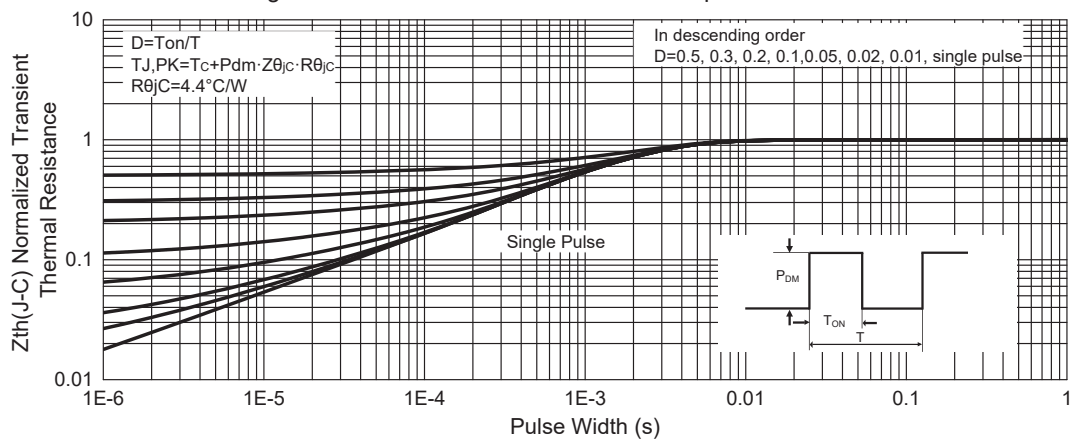


Fig. 13 - Normalized Transient Thermal Impedance



Ordering Information

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

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