

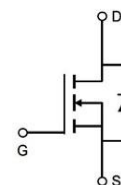
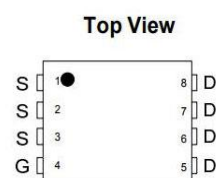
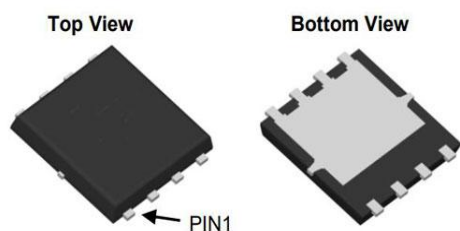
General Description

40V /30A Power MOSFET

Very low on-resistance $R_{DS(on)}$ @ $V_{GS}=4.5V$

Pb-free lead plating; RoHS compliant

V_{DS}	40	V
$R_{DS(on),TYP@V_{GS}=10V}$	6.6	mΩ
$R_{DS(on),TYP@V_{GS}=4.5}$	10.3	mΩ
I_D	30	A



Part ID	Package Type	Marking	Tape and reel information
AC30N04D	DFN5x6	30N04	3000



100% UIS Tested
100% Rg Tested

Parameter		Symbol	Maximum	Units
Drain-Source Voltage		V_{DS}	40	V
Gate-Source Voltage		V_{GS}	20	±V
Continuous Drain Current A	$T_A=25^{\circ}C$	I_D	30.0	A
	$T_A=70^{\circ}C$		30.0	
Pulsed Drain Current B		I_{DM}	48.0	
Avalanche Current C		I_{AR}	9.6	
Repetitive avalanche energy L=0.1mH G		E_{AR}	22.1	mJ
Power Dissipation A	$T_A=25^{\circ}C$	P_D	36.5	W
	$T_A=70^{\circ}C$		14.5	
Junction and Storage Temperature Range		T_J, T_{STG}	-55 to 150	°C

Thermal Characteristics

Parameter		Symbol	Typ	Max	Units
Maximum Junction-to-Ambient A	$t \leq 10s$	R_{JA}	23	35	°C/W
Maximum Junction-to-Ambient A	Steady State		47	56	°C/W
Maximum Junction-to-Lead c	Steady State	R_{JL}	14	22	°C/W

STATIC PARAMETERS

Symbol	Parameter	Conditions	Min	Typ	Max	Units
BV _{DSS}	Drain-Source Breakdown Voltage	I _D = -250 μ A, V _{GS} = 0V	40			V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =40V, V _{GS} =0V			1	μ A
					5	
I _{GSS}	Gate-Body leakage current	V _{DS} = 0V, V _{GS} = $\pm$ 20V			$\pm$ 100	nA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} = V _{GS} I _D = 250 μ A	1.3	1.9	2.5	V
R _{DS(on)}	Static Drain-Source On-Resistance	V _{GS} =10V, I _D =20A		6.6	9.4	m Ω
		V _{GS} =4.5V, I _D =20A		10.3	13.4	
g _{FS}	Forward Transconductance	V _{DS} =5V, I _D =20A		59		S
V _{SD}	Diode Forward Voltage	I _S =1A, V _{GS} =114V		0.72	1	V
I _S	Maximum Body-Diode Continuous Current				30	A

DYNAMIC PARAMETERS

Symbol	Parameter	Conditions	Min	Typ	Max	Units
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =15V, f=1MHz		1480	1805	pF
C _{oss}	Output Capacitance			245	301	pF
C _{rss}	Reverse Transfer Capacitance			13	15	pF
R _g	Gate resistance	V _{GS} =0V, V _{DS} =0V, f=1MHz			1.5	Ω

SWITCHING PARAMETERS

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Q _g (10V)	Total Gate Charge	V _{GS} =10V, V _{DS} =15V, I _D =20A		8.5		nC
Q _g 4.5V)	Total Gate Charge			4.25		
Q _{gs}	Gate Source Charge			2.1		
Q _{gd}	Gate Drain Charge			3		
t _{D(on)}	Turn-On DelayTime	V _{GS} =10V, V _{DS} =15V, R _L =0.75 Ω , R _{GEN} =3 Ω		5.5		ns
t _r	Turn-On Rise Time			4.4		
t _{D(off)}	Turn-Off DelayTime			15.4		
t _f	Turn-Off Fall Time			4.95		
t _{rr}	Body Diode Reverse Recovery Time	I _F =-8A, dI/dt=500A/ μ s		11		ns
Q _{rr}	Body Diode Reverse Recovery Charge	I _F =18A, dI/dt=500A/ μ s		21		nC

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

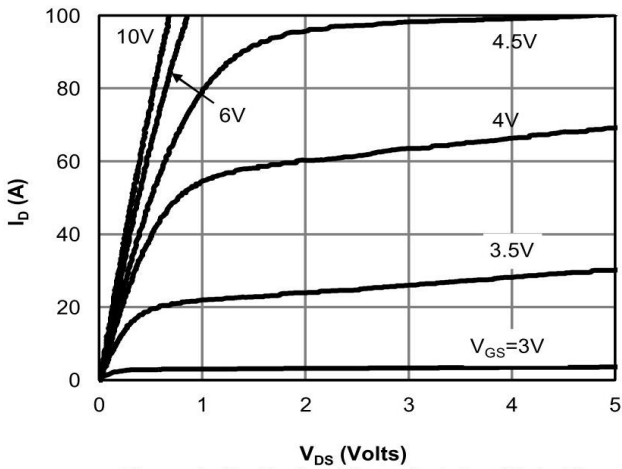


Figure 1: On-Region Characteristics (Note E)

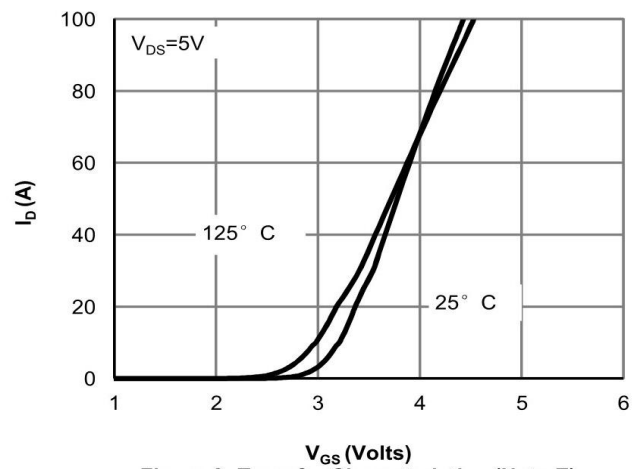


Figure 2: Transfer Characteristics (Note E)

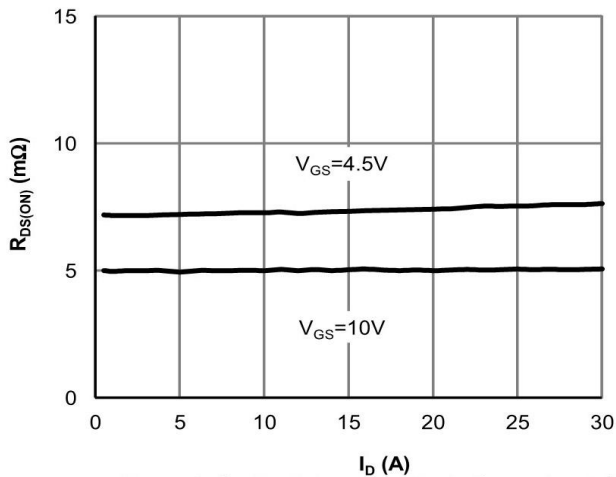


Figure 3: On-Resistance vs. Drain Current and Gate Voltage (Note E)

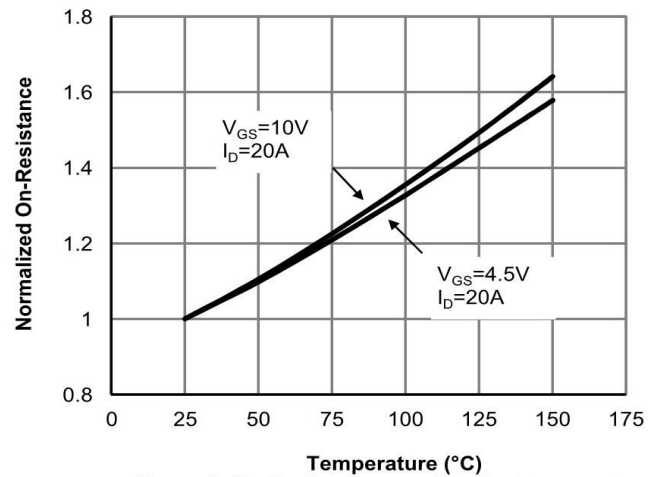


Figure 4: On-Resistance vs. Junction Temperature (Note E)

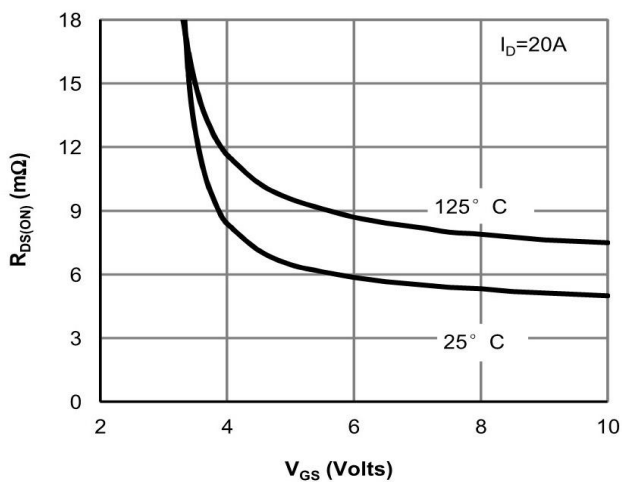


Figure 5: On-Resistance vs. Gate-Source Voltage (Note E)

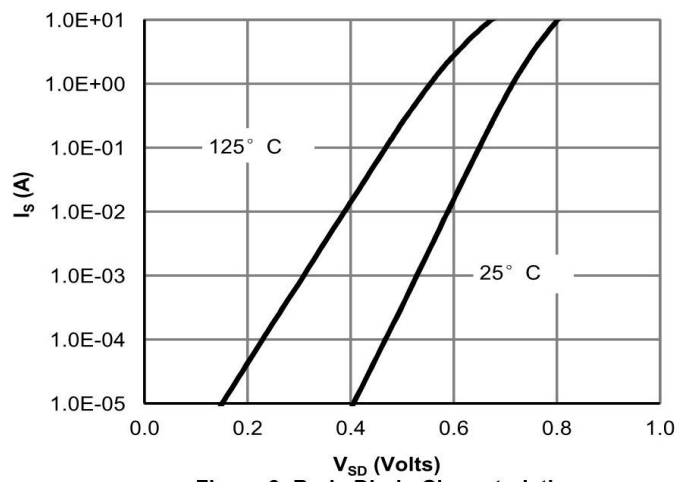


Figure 6: Body-Diode Characteristics (Note E)

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

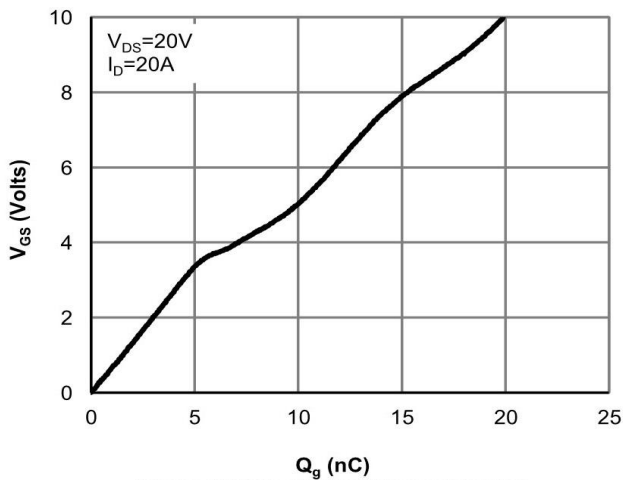


Figure 7: Gate-Charge Characteristics

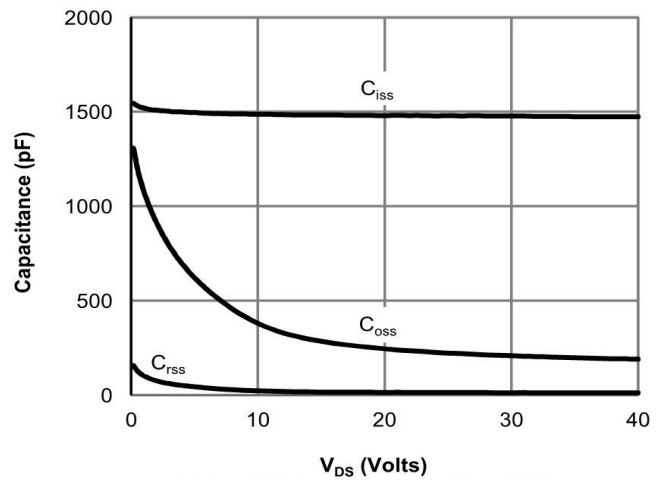


Figure 8: Capacitance Characteristics

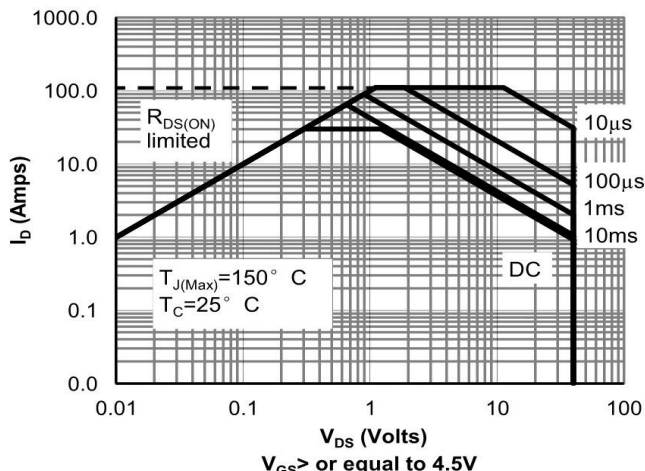


Figure 9: Maximum Forward Biased Safe Operating Area (Note F)

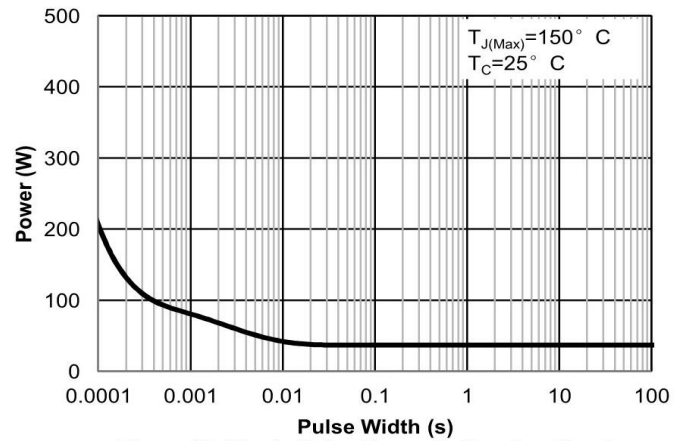


Figure 10: Single Pulse Power Rating Junction-to-Case (Note F)

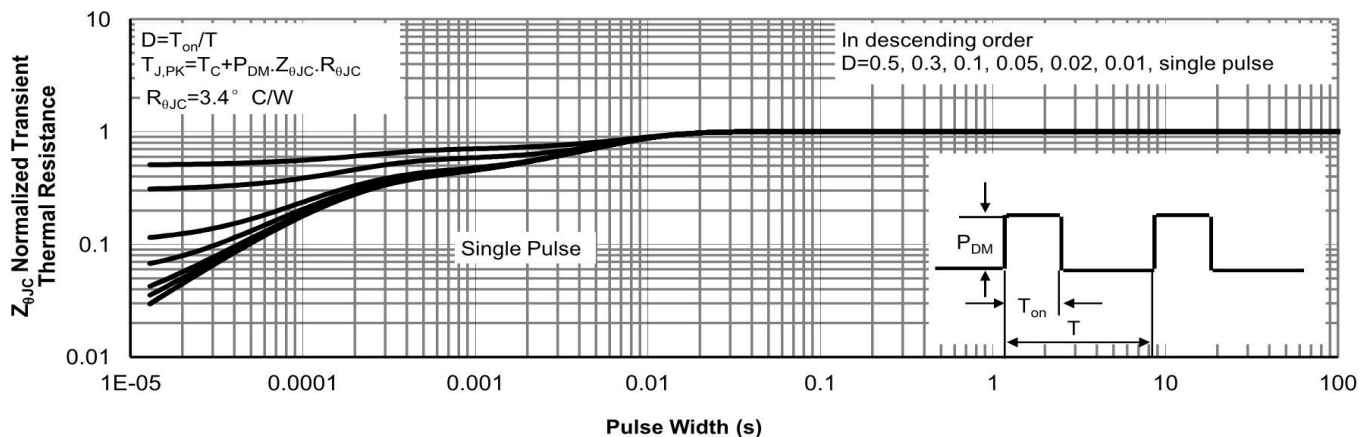


Figure 11: Normalized Maximum Transient Thermal Impedance (Note F)

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

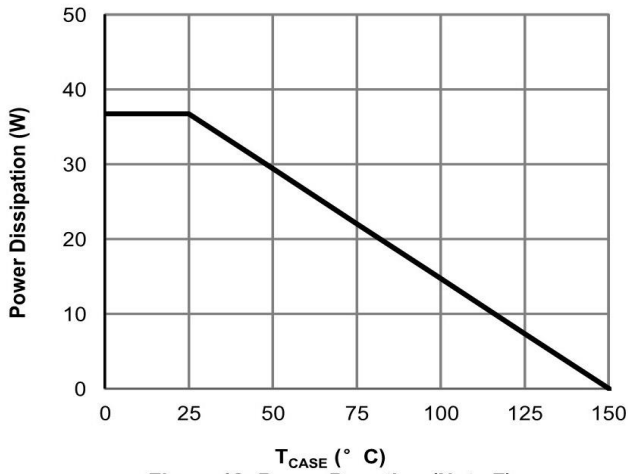


Figure 12: Power De-rating (Note F)

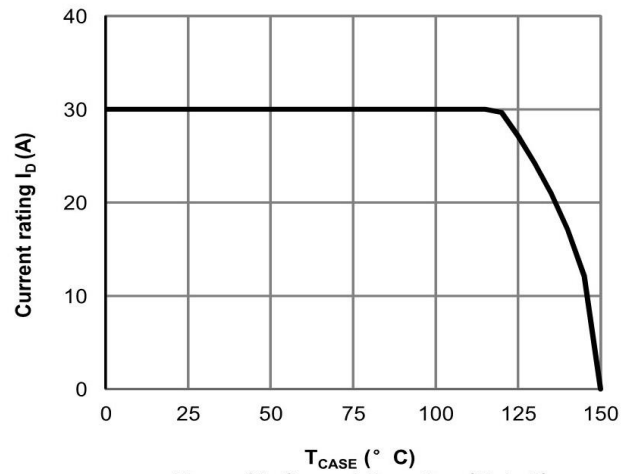


Figure 13: Current De-rating (Note F)

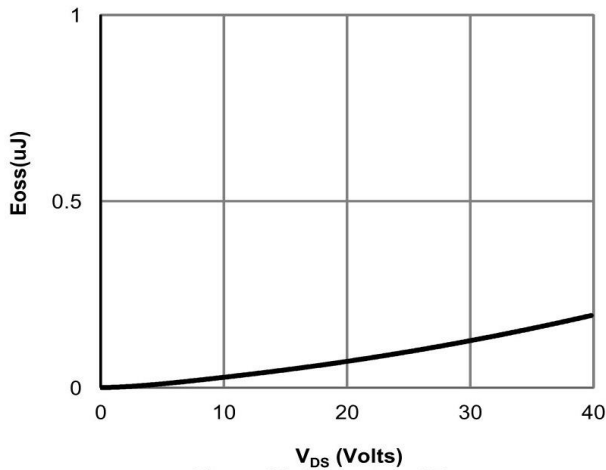


Figure 14: Coss stored Energy

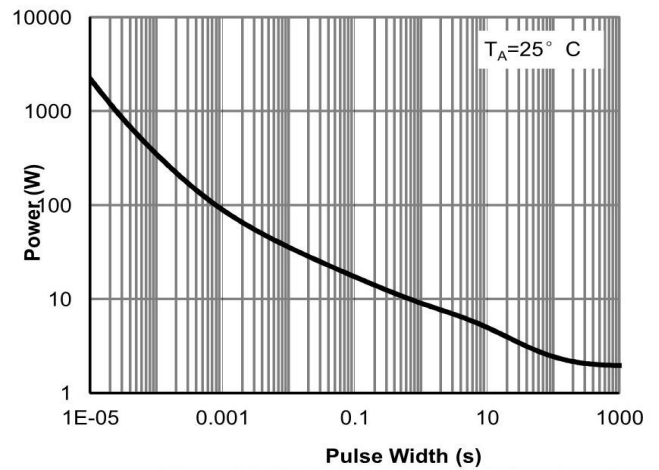


Figure 15: Single Pulse Power Rating Junction-to-Ambient (Note H)

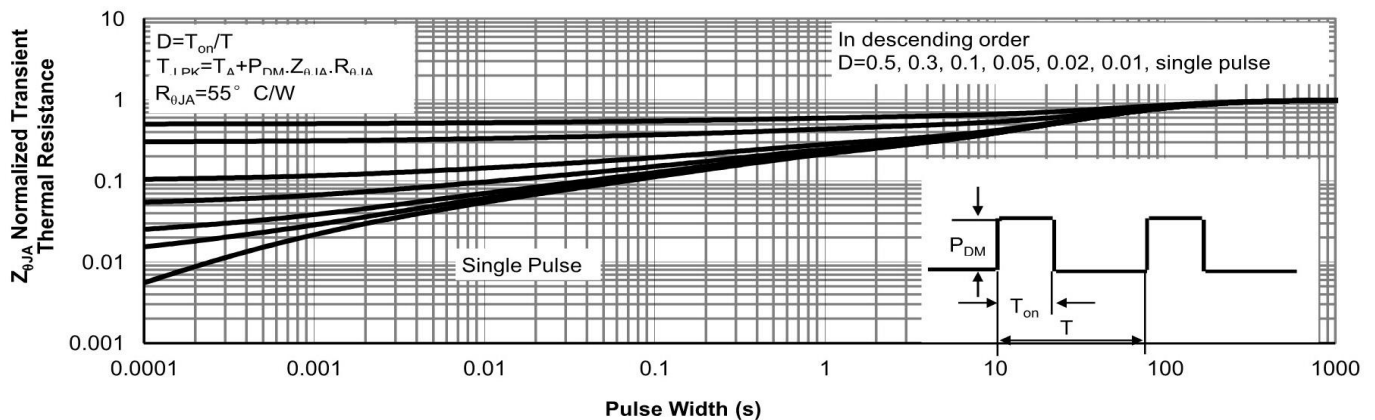


Figure 16: Normalized Maximum Transient Thermal Impedance (Note H)