ASR04N03S

N-Channel Super Trench Power MOSFET

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
30V	5.8mΩ@10V	60A
	8mΩ@4.5V	

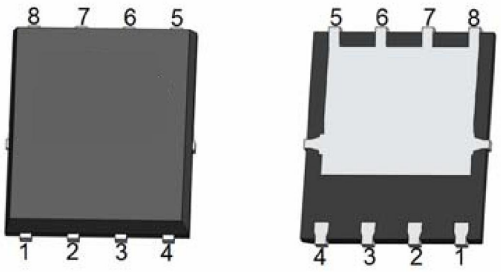
Feature

- Fast Switching
- Low Gate Charge and Rdson
- Low Reverse transfer capacitances
- 100% Single Pulse avalanche energy Test

Application

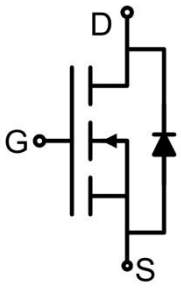
- Power switching application
- Isolated DC/DC Converters in Telecom and Industrial

Package

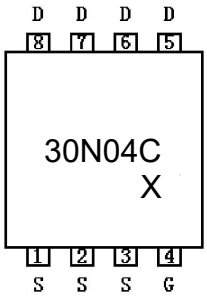


DFN5X6-8L

Circuit diagram



Marking



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Absolute maximum ratings (Ta=25℃ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current (T_C =25℃)[1]	I_D	60	A
Continuous Drain Current (T_C =100℃)[1]	I_D	38	A
Pulsed Drain Current[2]	I_{DM}	240	A
Power Dissipation[4]	P_D	87	W
Thermal Resistance ,Junction-to-Ambient[1]	$R_{\theta JA}$	50	℃/W
Thermal Resistance,Junction-to-Case[1]	$R_{\theta JC}$	1.5	℃/W
Single pulse avalanche energy[3]	E_{AS}	20	mJ
Junction Temperature	T_J	-55 ~ +150	℃
Storage Temperature	T_{STG}	-55 ~ +150	℃

Electrical characteristics (Ta=25 ºC, unless otherwise noted)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-source breakdown voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D =250uA	30	-	-	V
Drain-source Leakage current	I_{DSS}	V_{DS} =24V,V_{GS} = 0V TJ=25℃	-	-	1	μA
Gate-body leakage current	I_{GSS}	V_{GS} =±20V, V_{DS} = 0V	-	-	±100	nA
Gate threshold voltage	$V_{GS(th)}$	V_{DS} =V_{GS}, I_D =250μA	1.0	1.7	2.5	V
Drain-source on-resistance[2]	$R_{DS(on)}$	V_{GS} =10V, I_D =15A	-	4	5.8	mΩ
		V_{GS} =4.5V, I_D =10A	-	6	8	
Dynamic characteristics						
Input Capacitance	C_{iss}	V_{DS} =15V,V_{GS} =0V,f =1MHz	-	1109	-	pF
Output Capacitance	C_{oss}		-	240	-	
Reverse Transfer Capacitance	C_{rss}		-	220	-	
Total Gate Charge(4.5V)	Q_g	V_{DS} =15V,V_{GS} =10V, I_D =15A	-	6.7	-	nC
Gate-Source Charge	Q_{gs}		-	2.1	-	
Gate-Drain Charge	Q_{gd}		-	2.0	-	
Turn-on delay time	$t_{d(on)}$	V_{DD}=15V,V_{GS}=10V, I_D=15A,R_{GEN}=6Ω	-	2.4	-	nS
Turn-on rise time	t_r		-	2.5	-	
Turn-off delay time	$t_{d(off)}$		-	12.7	-	
Turn-off fall time	t_f		-	6.9	-	
Source-Drain Diode characteristics						
Diode Forward Current[1],[5]	I_S		-	-	60	A
Diode Forward voltage[2]	V_{SD}	V_{GS} =0V, I_S=1A, TJ =25℃	-	-	1.2	V

Notes:

1) The data tested by surface mounted on a 1 inch2 FR-4 board with 2OZ copper.

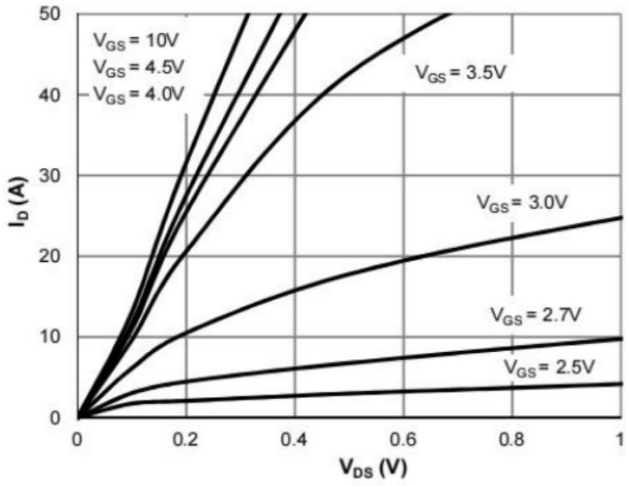
2) The data tested by pulsed , pulse width ≦ 300us , duty cycle≦2%.

3) The EAS data shows Max. rating . The test condition is VDD=25V,VGS=10V,L=0.1mH,IAS=20A.

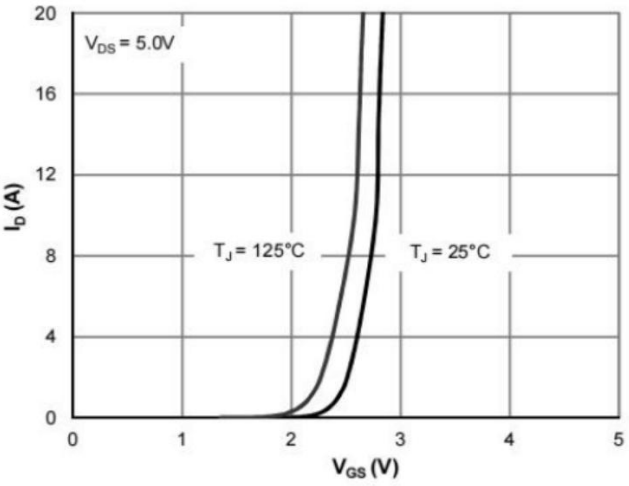
4) The power dissipation is limited by 150℃ junction temperature.

5) The data is theoretically the same as ID and IDM , in real applications , should be limited by total power dissipation.

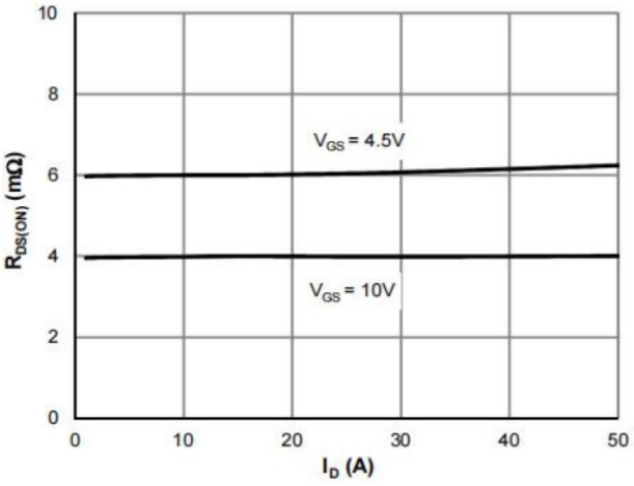
Typical Characteristics



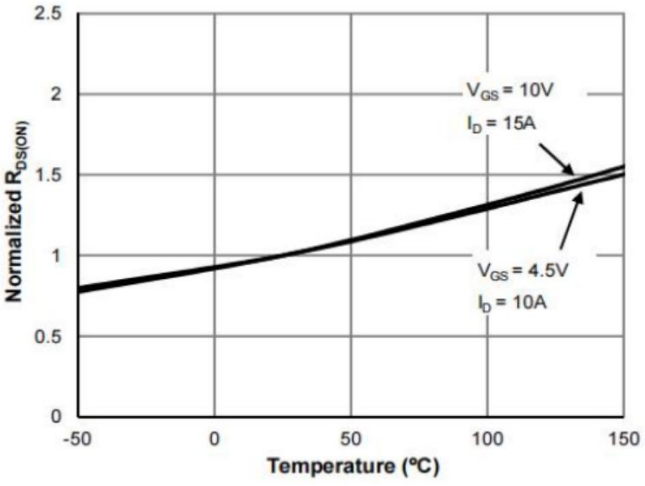
Typical Output Characteristics



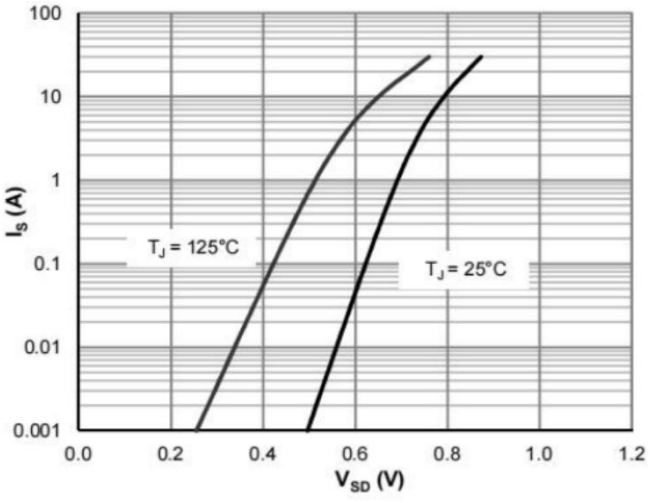
Transfer Characteristics



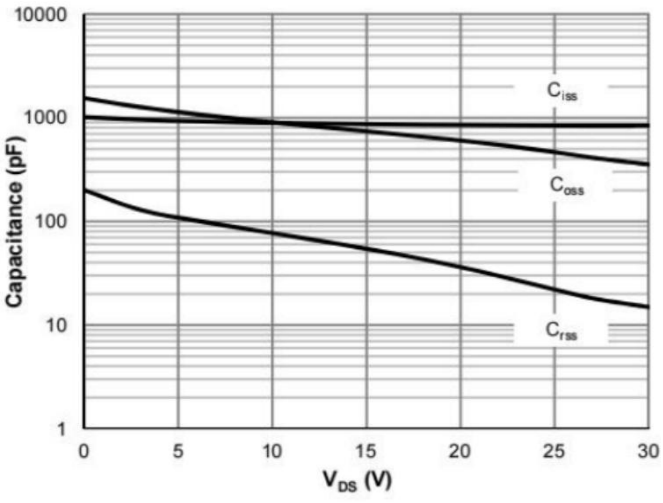
RDS(ON) vs. Drain Current



RDS(ON) vs. Junction Temperature

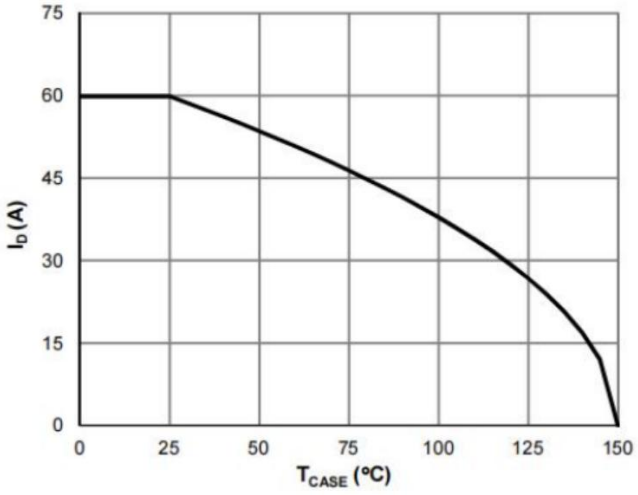


Body-Diode Characteristics

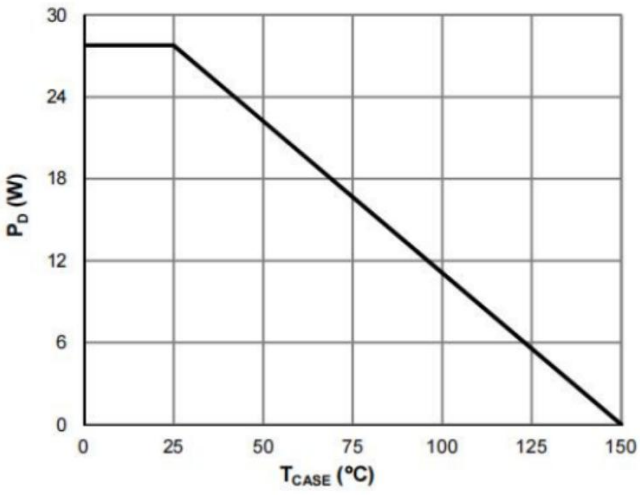


Capacitance Characteristics

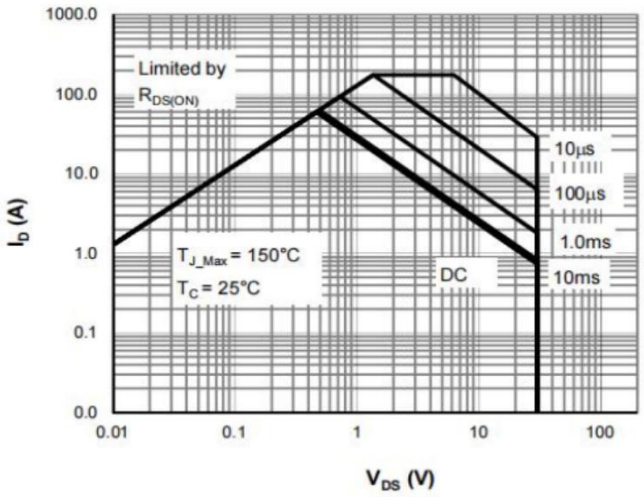
Typical Characteristics



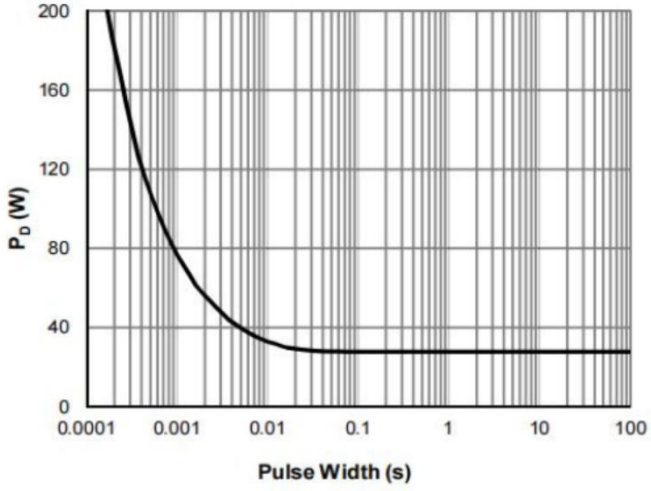
Current De-ratin



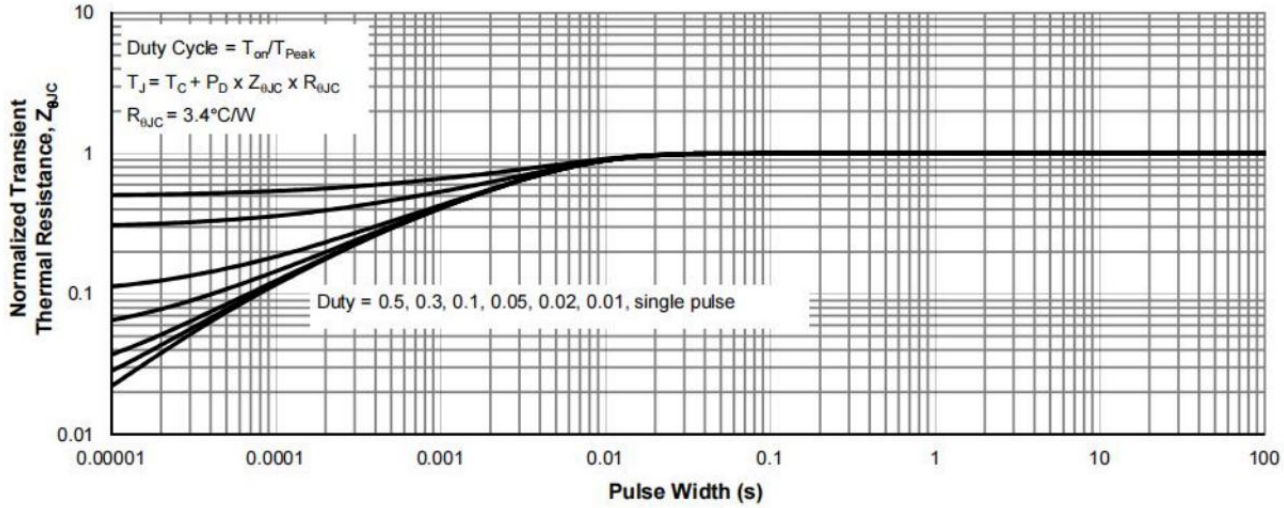
Power De-rating



Maximum Safe Operating Area

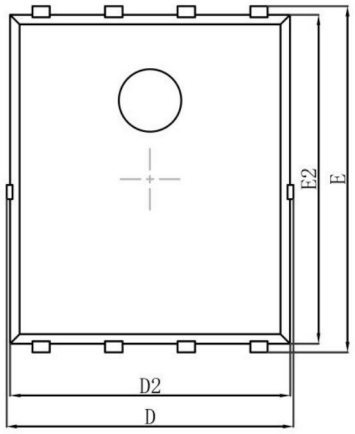


Single Pulse Power Rating, Junction-to-Case

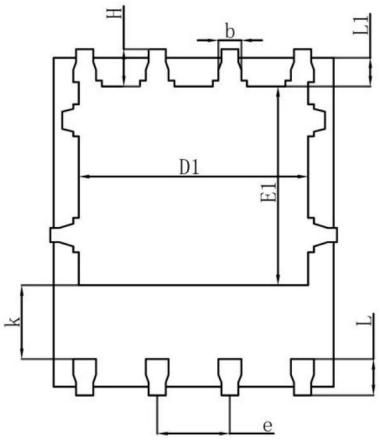


Normalized Maximum Transient Thermal Impedance

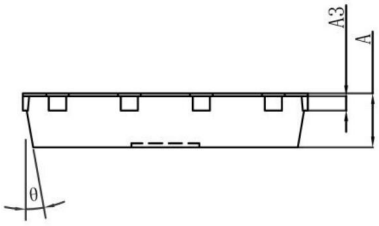
DFN5X6-8L Package Information



Top View



Bottom View



Side View

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.000	0.035	0.039
A3	0.254 REF		0.010 REF	
D	4.944	5.096	0.195	0.201
E	5.974	6.126	0.235	0.241
D1	3.910	4.110	0.154	0.162
E1	3.375	3.575	0.133	0.141
D2	4.824	4.976	0.190	0.196
E2	5.674	5.826	0.223	0.229
k	1.190	1.390	0.047	0.055
b	0.350	0.450	0.014	0.018
e	1.270TYP		0.050TYP	
L	0.559	0.711	0.022	0.028
L1	0.424	0.576	0.017	0.023
H	0.574	0.726	0.023	0.029
θ	10°	12°	10°	12°