

Dual N-Channel MOSFET

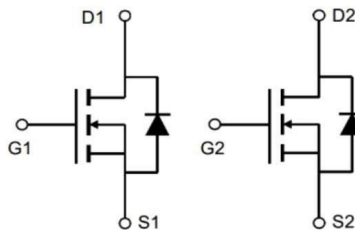
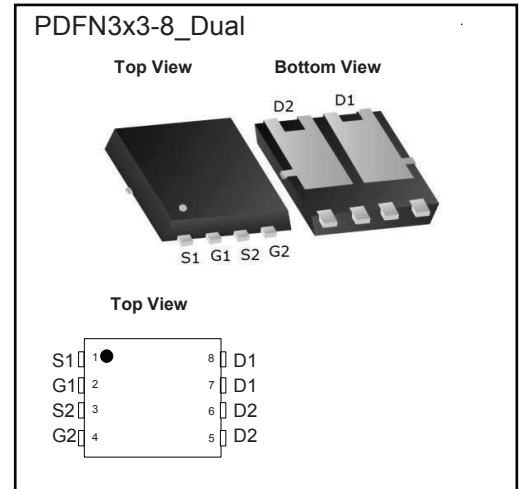
RC45N03DD3

■ Features

- Trench Power LV MOSFET technology
- Excellent package for heat dissipation
- High density cell design for low $R_{DS(ON)}$
- V_{DS} (V)= 30 V
- I_D = 45 A
- $R_{DS(ON)}$ (at V_{GS} = 10 V) < 9 m Ω
- $R_{DS(ON)}$ (at V_{GS} = 4.5 V) < 13 m Ω

■ Application

- High current load applications
- Load switching
- Hard switched and high frequency circuits
- Uninterruptible power supply



■ Absolute Maximum Ratings ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Parameter		Symbol	Limit	Unit
Drain-source Voltage		V_{DS}	30	V
Gate-source Voltage		V_{GS}	± 20	V
Drain Current	$T_C=25^\circ\text{C}$	I_D	45	A
	$T_C=100^\circ\text{C}$		25	
Pulsed Drain Current ^A		I_{DM}	150	A
Total Power Dissipation	$T_C=25^\circ\text{C}$	P_D	42	W
	$T_C=100^\circ\text{C}$		21	W
Single Pulse Avalanche Energy ^B		E_{AS}	225	mJ
Thermal Resistance Junction-to-Case ^C		$R_{\theta JC}$	3.6	$^\circ\text{C}/\text{W}$
Junction and Storage Temperature Range		T_J, T_{STG}	-55~+175	$^\circ\text{C}$

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■ Electrical Characteristics(T_J=25℃ unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Static Parameter						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} = 0V, I _D =250μA	30			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =30V, V _{GS} =0V			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	1.5	2.5	V
Static Drain-Source On-Resistance	R _{DS(on)}	V _{GS} = 10V, I _D =15A		7	9	mΩ
		V _{GS} = 4.5V, I _D =15A		8.8	13	
Diode Forward Voltage	V _{SD}	I _S =20A, V _{GS} =0V			1.2	V
Maximum Body-Diode Continuous Current	I _S				45	A
Dynamic Parameters						
Input Capacitance	C _{iss}	V _{DS} =15V, V _{GS} =0V, f=1MHZ		2504		pF
Output Capacitance	C _{oss}			323		
Reverse Transfer Capacitance	C _{rss}			283		
Gate resistance	R _g	F= 1MHZ			3	Ω
Switching Parameters						
Total Gate Charge	Q _g	V _{GS} =10V, V _{DS} =15V, I _D =20A		54		nC
Gate-Source Charge	Q _{gs}			26		
Gate-Drain Charge	Q _{gd}			8.5		
Reverse Recovery Chrage	Q _{rr}	I _F =15A, di/dt=100A/us		10.2		ns
Reverse Recovery Time	t _{rr}			15		
Turn-on Delay Time	t _{D(on)}	V _{GS} =10V, V _{DD} =20V, I _D =2A R _{GEN} =3Ω		11		
Turn-on Rise Time	t _r			20		
Turn-off Delay Time	t _{D(off)}			41		
Turn-off fall Time	t _f			25		

A. Pulse Test: Pulse Width≤300us, Duty cycle ≤2%.

B. R_{θJA} is the sum of the junction-to-Case and Case-to-ambient thermal resistance, where the Case thermal reference is defined as the solder mounting surface of the drain pins. R_{θJC} is guaranteed by design, while R_{θJA} is determined by the board design. The maximum rating presented here is based on mounting on a 1 in 2 pad of 2oz copper.

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Typical Performance Characteristics

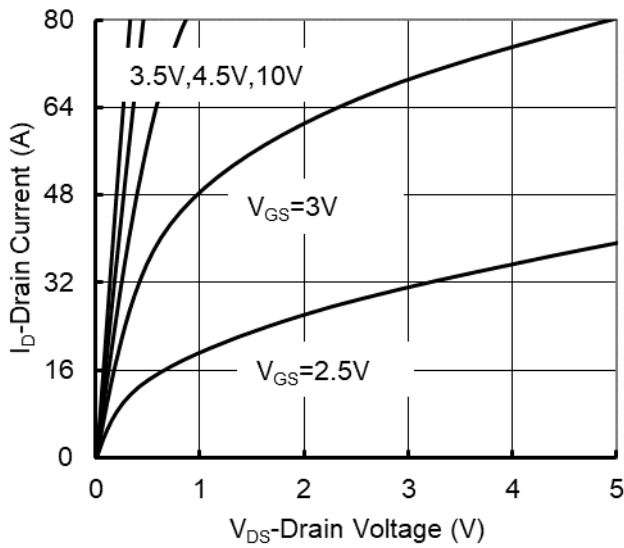


Figure1. Output Characteristics

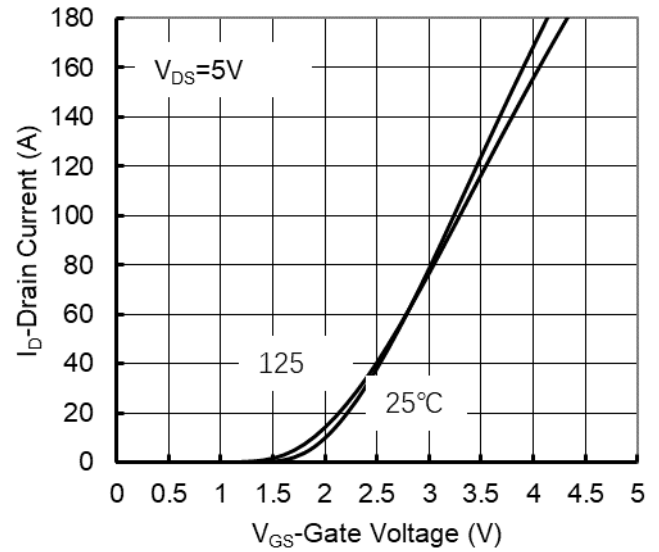


Figure2. Transfer Characteristics

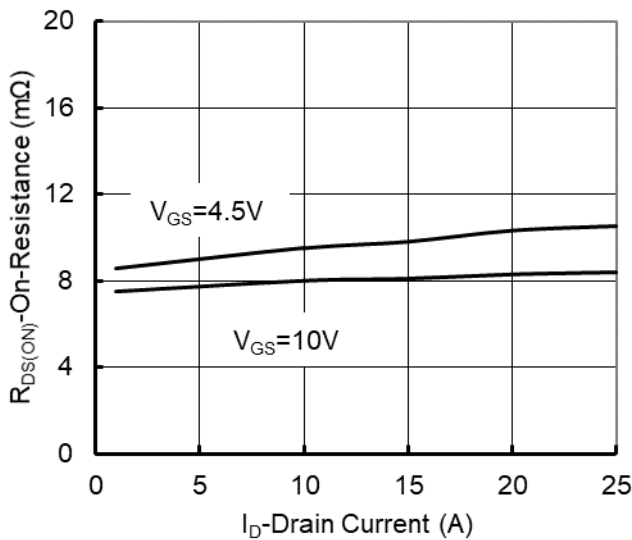


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

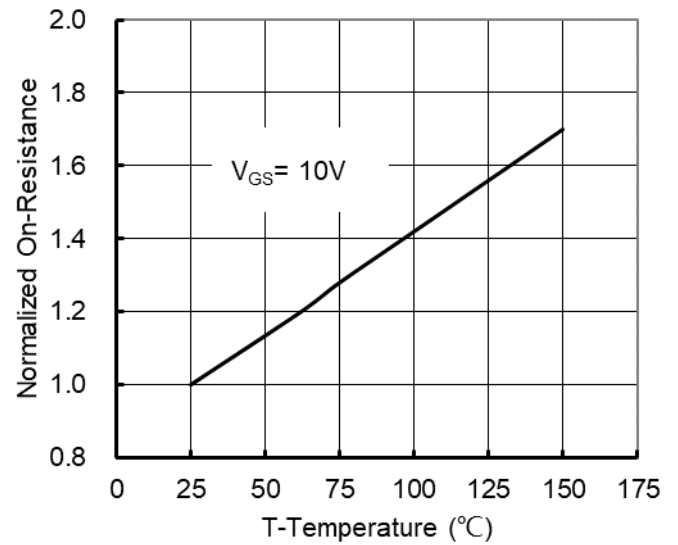


Figure 4: On-Resistance vs. Junction Temperature

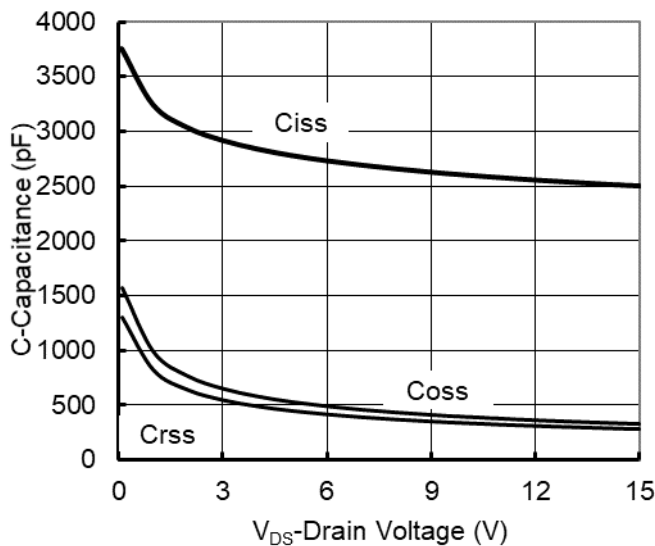


Figure5. Capacitance Characteristics

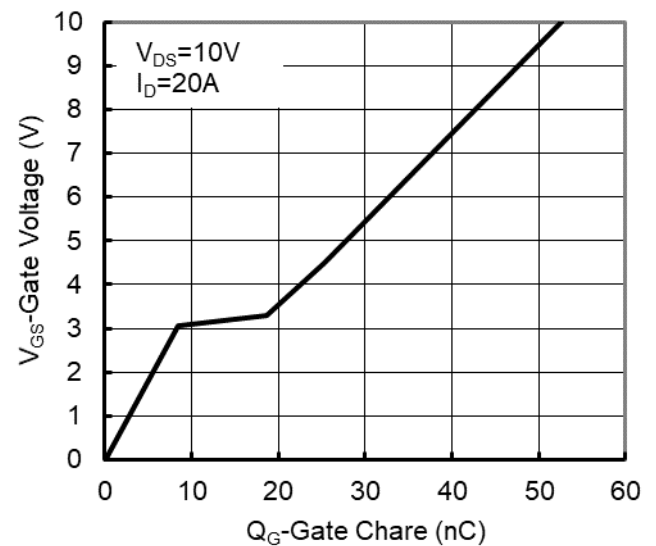


Figure6. Gate Charge

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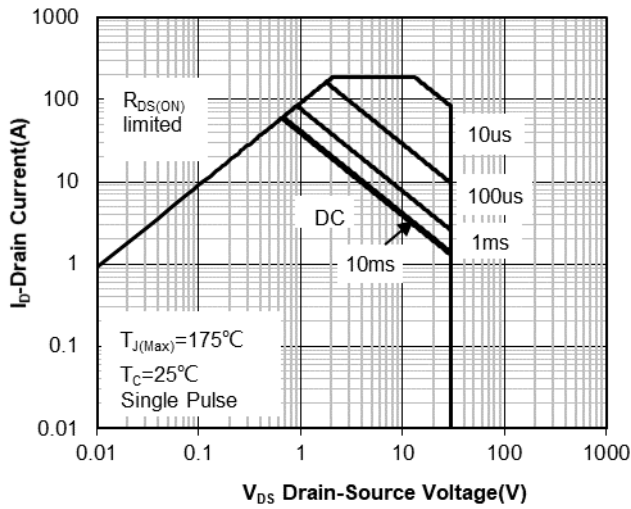


Figure7. Safe Operation Area

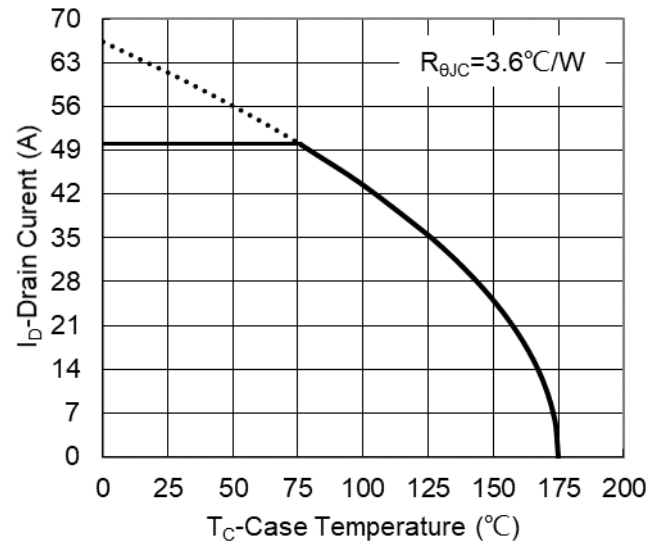


Figure8. Maximum Continuous Drain Current vs Case Temperature

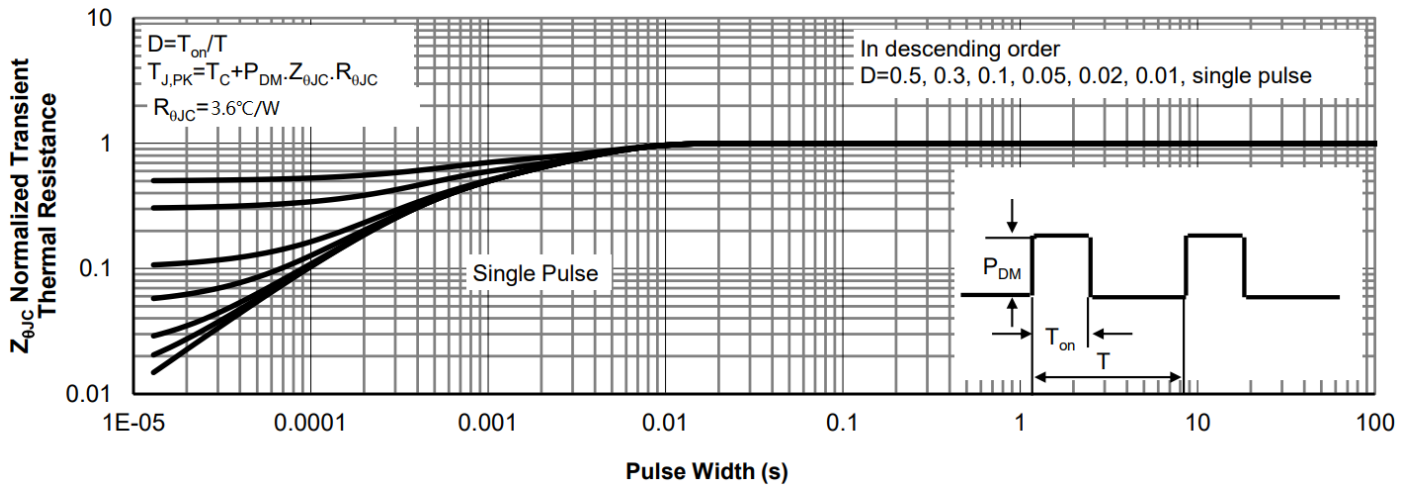
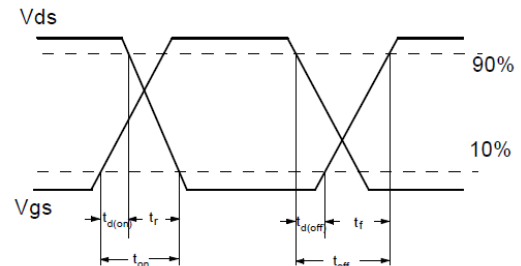
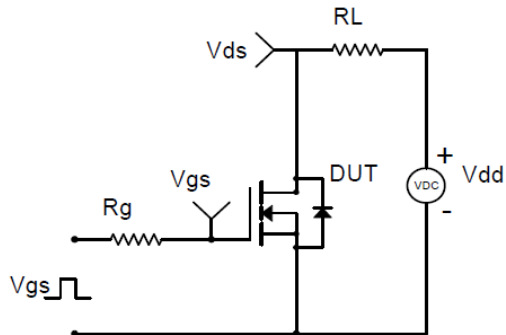


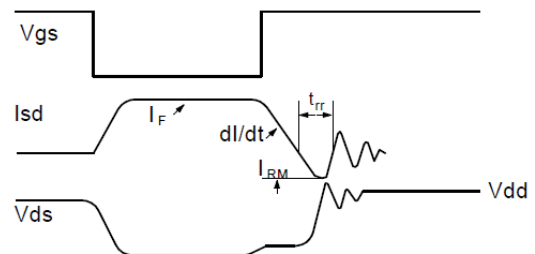
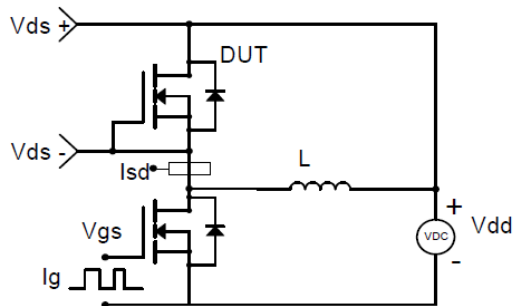
Figure9.Normalized Maximum Transient Thermal Impedance

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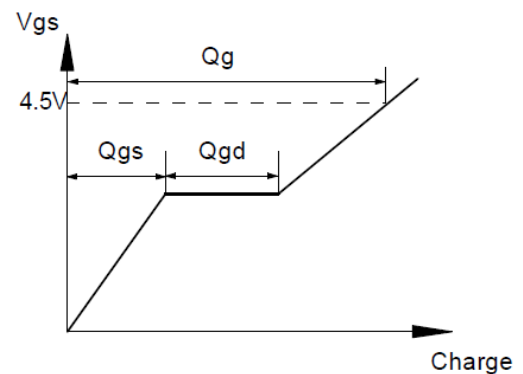
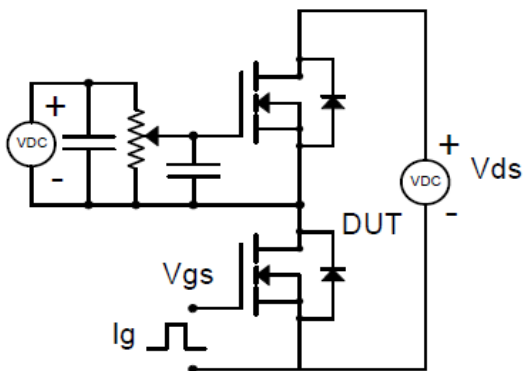
■ Test Circuit



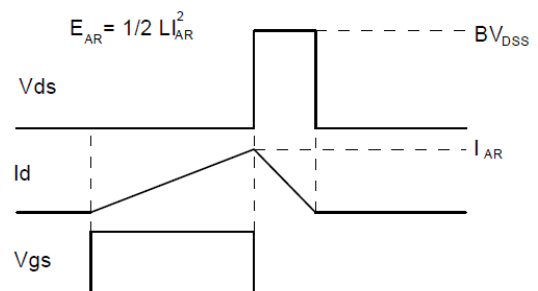
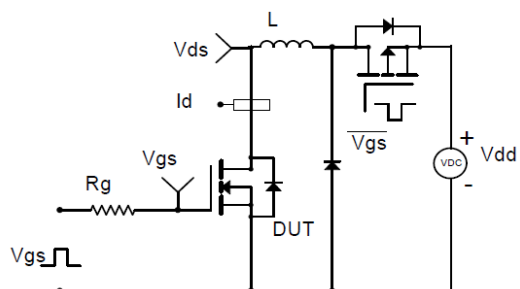
Resistive Switching Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



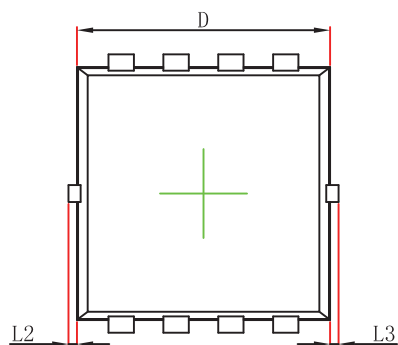
Gate Charge Test Circuit & Waveform



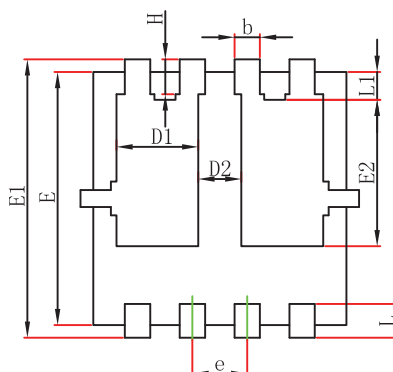
Unclamped Inductive Switching (UIS) Test Circuit & Waveforms

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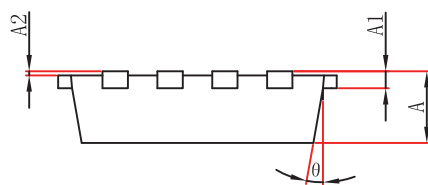
PDFN3x3-8 Package Outline Dimensions



Top View
[顶视图]



Bottom View
[背视图]



Side View
[侧视图]

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.650	0.850	0.026	0.033
A1	0.152 REF.		0.006 REF.	
A2	0~0.05		0~0.002	
D	2.900	3.100	0.114	0.122
D1	0.935	1.135	0.037	0.045
D2	0.280	0.480	0.011	0.019
E	2.900	3.100	0.114	0.122
E1	3.150	3.450	0.124	0.136
E2	1.535	1.935	0.060	0.076
b	0.200	0.400	0.008	0.016
e	0.550	0.750	0.022	0.030
L	0.300	0.500	0.012	0.020
L1	0.180	0.480	0.007	0.019
L2	0~0.100		0~0.004	
L3	0~0.100		0~0.004	
H	0.315	0.515	0.012	0.020
θ	9°	13°	9°	13°