

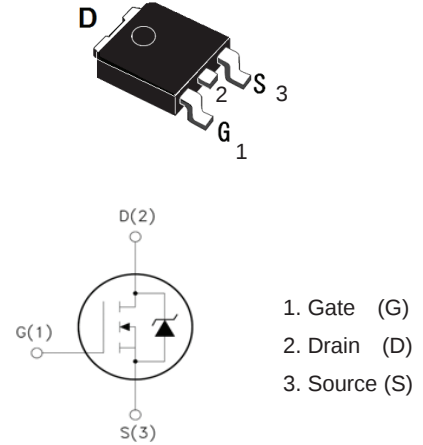
N-Channel Trench Power MOSFET

RCD40N06

■ Features

- $V_{DS} (V) = 60V$
- $I_D = 45A$
- $R_{DS(ON)} < 15m\Omega$ @ $V_{GS} = 10V$

TO-252



■ Absolute Maximum Ratings ($T_A = 25^\circ C$, unless otherwise specified)

Parameter		Symbol	Rating	Unit
Drain-Source Voltage		V_{DS}	60	V
Gate-Source Voltage		V_{GS}	± 25	
Continuous Drain Current	$T_C = 25^\circ C$	I_D	45	A
	$T_C = 100^\circ C$		31	
Pulsed Drain Current (Note 1)		I_{DM}	180	
Avalanche Energy, Single Pulsed (Note 2)		E_{AS}	196	mJ
Power Dissipation ($T_C = 25^\circ C$)		P_D	68	W
Thermal Resistance, Junction- to-Case		R_{thJC}	2.2	$^\circ C/W$
Junction Temperature		T_J	175	$^\circ C$
Storage Temperature Range		T_{stg}	-55 to 175	

Notes: 1.Repetitive Rating: Pulse width limited by maximum junction temperature

2.EAS condition: $T_J = 25^\circ C$, $V_{DD} = 30V$, $V_G = 10V$, $R_G = 25\Omega$

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■ Electrical Characteristics (T_A = 25°C, unless otherwise specified)

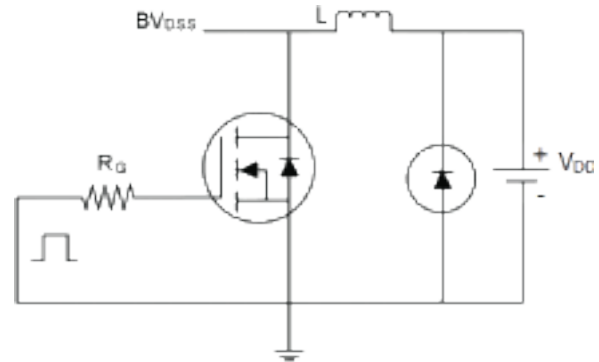
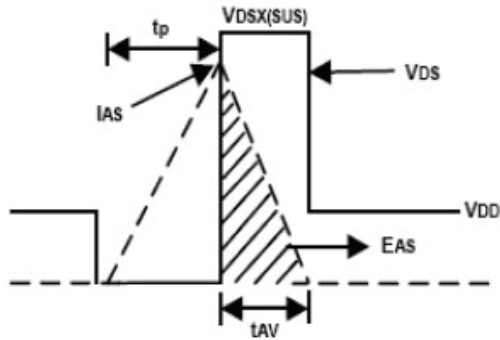
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	V _{DSS}	I _D =250μA, V _{GS} =0V	60			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =60V, V _{GS} =0V, T _C =25°C			1	μA
		V _{DS} =60V, V _{GS} =0V, T _C =100°C			5	
Gate-Body Leakage Current	I _{GSS}	V _{DS} =0V, V _{GS} =±25V			±100	nA
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	1.1		2.1	V
Static Drain-Source On-Resistance	R _{DS(on)}	V _{GS} =10V, I _D =20A			15	mΩ
		V _{GS} =4.5V, I _D =20A			19	
Forward Transconductance	g _{FS}	V _{DS} =10V, I _D =15A	18			S
Input Capacitance	C _{iss}	V _{GS} =0V, V _{DS} =25V, f=1MHz		1659		pF
Output Capacitance	C _{oss}			180		
Reverse Transfer Capacitance	C _{rss}			128		
Total Gate Charge	Q _g	V _{DS} =30V, I _D =15A, V _{GS} =10V		50		nC
Gate Source Charge	Q _{gs}			12		
Gate Drain Charge	Q _{gd}			23		
Turn-On Delay Time	t _{d(on)}	V _{DS} =30V, R _L =2.5Ω V _{GS} =10V, R _G =3Ω		15		ns
Turn-On Rise Time	t _r			25		
Turn-Off Delay Time	t _{d(off)}			53		
Turn-Off Fall Time	t _f			23		
Maximum Body-Diode Continuous Current	I _S			45		A
Source Current Pulsed	I _{SM}			180		
Diode Forward Voltage (Note 1)	V _{SD}	T _J =25°C, I _{SD} =1A, V _{GS} =0V			0.99	V
Reverse Recovery Time (Note 1)	t _{rr}	T _J =25°C, I _F =15A di/dt=100A/μs		24		nS
Reverse Recovery Charge (Note 1)	Q _{rr}			30		nC
Forward Turn-on Time	t _{on}	Intrinsic turn-on time is negligible(turn-on is dominated by L _s +L _D)				

Notes 1. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 1.5%, Starting T_J=25°C

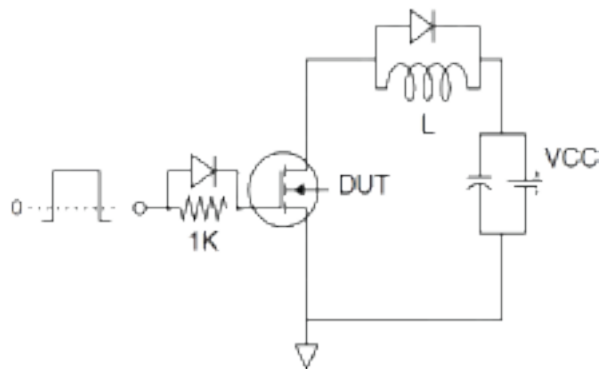
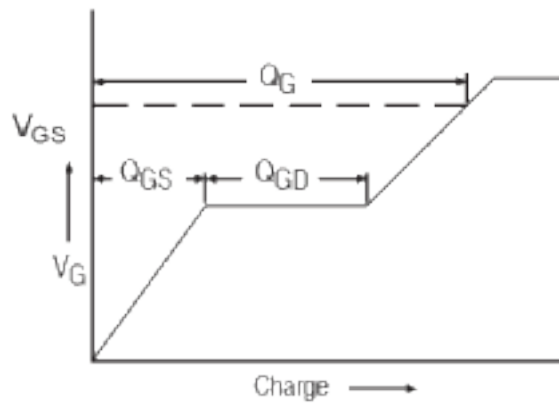
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■ Test Circuit

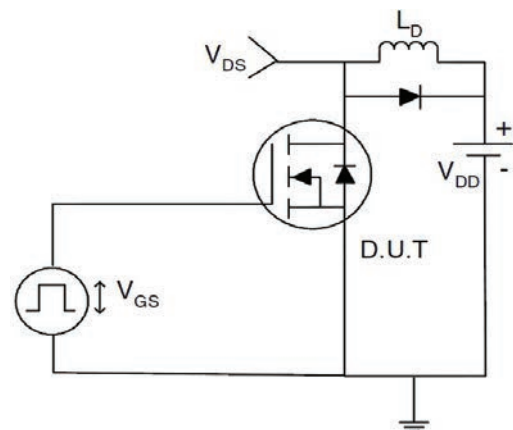
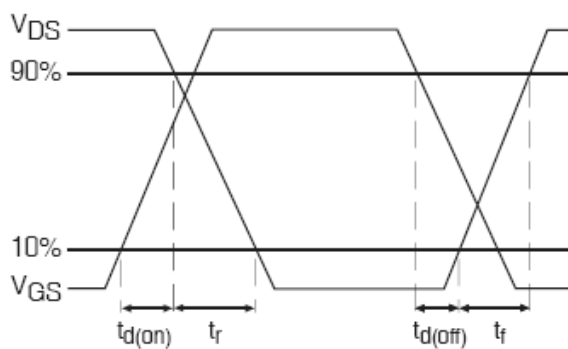
1) E_{AS} Test Circuits



2) Gate Charge Test Circuit:



3) Switch Time Test Circuit:



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■ Typical Electrical And Thermal Characteristics (Curves)

Figure1. Output Characteristics

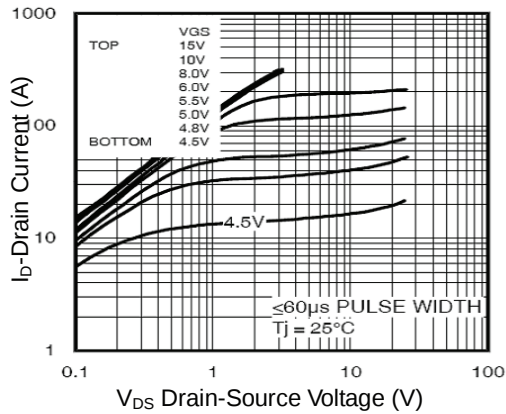


Figure2. Transfer Characteristics

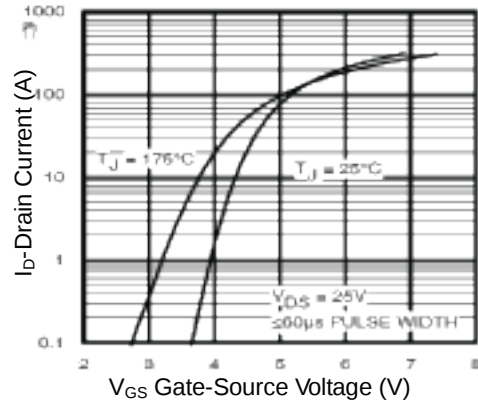


Figure3. BVDS vs Junction Temperature

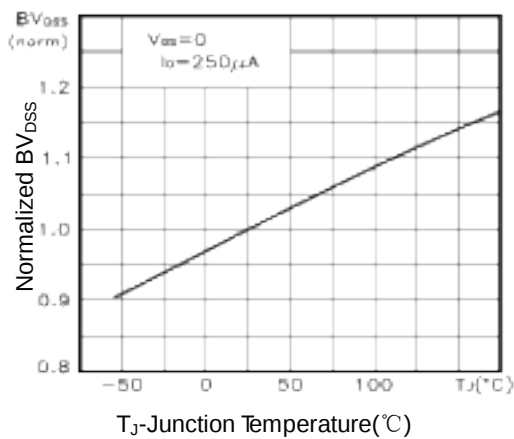


Figure4. ID vs Junction Temperature

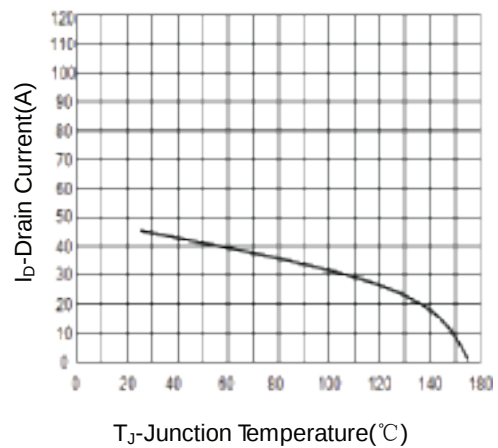


Figure5. VGS(th) vs Junction Temperature

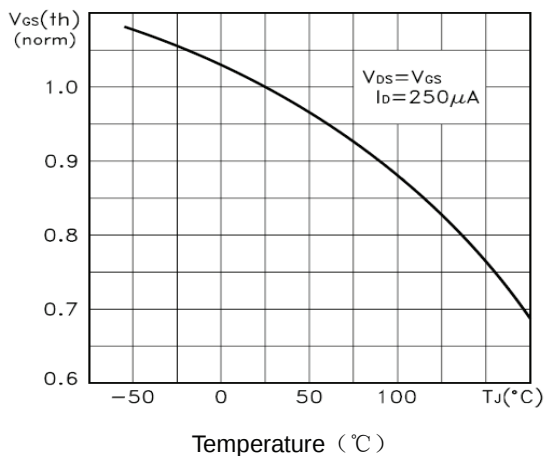
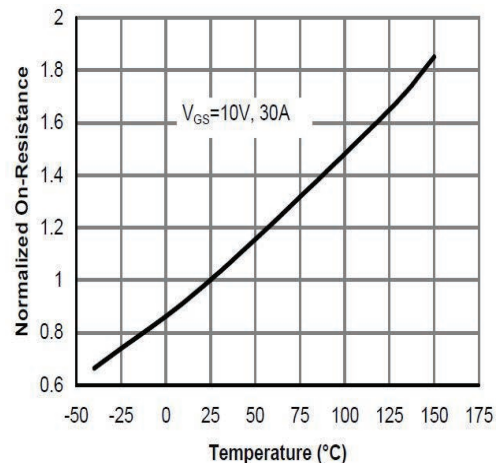


Figure6. Rdson Vs Junction Temperature



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Figure7. Gate Charge

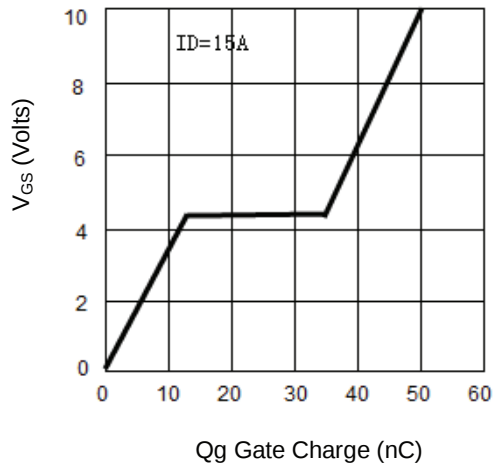


Figure8. Capacitance vs Vds

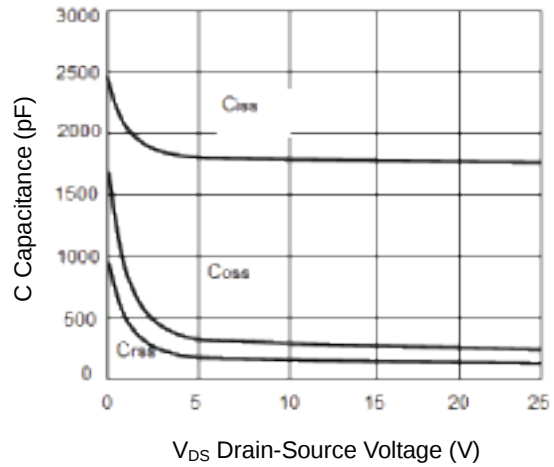


Figure9. Source- Drain Diode Forward

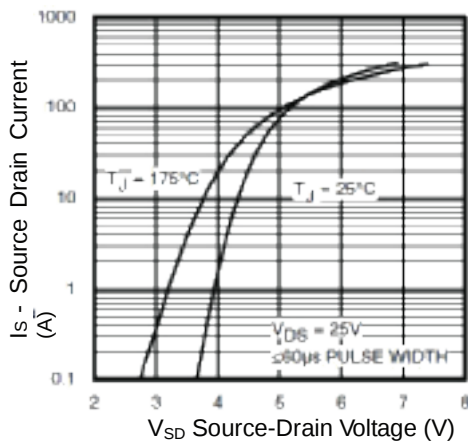


Figure10. Safe Operation Area

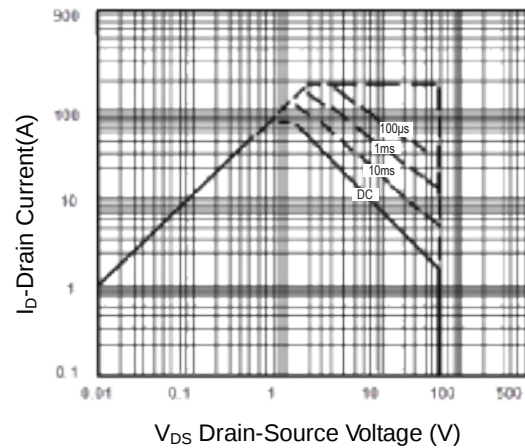
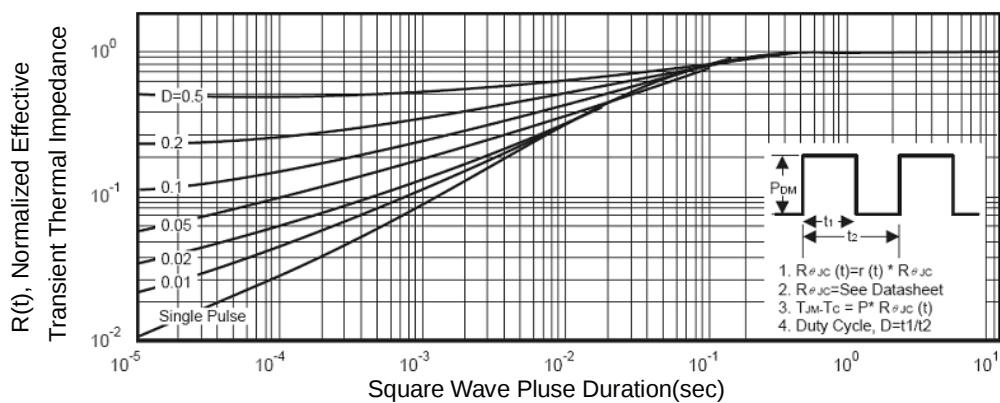


Figure11. Normalized Maximum Transient Thermal Impedance

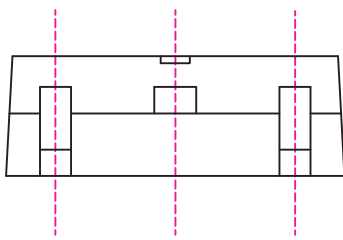
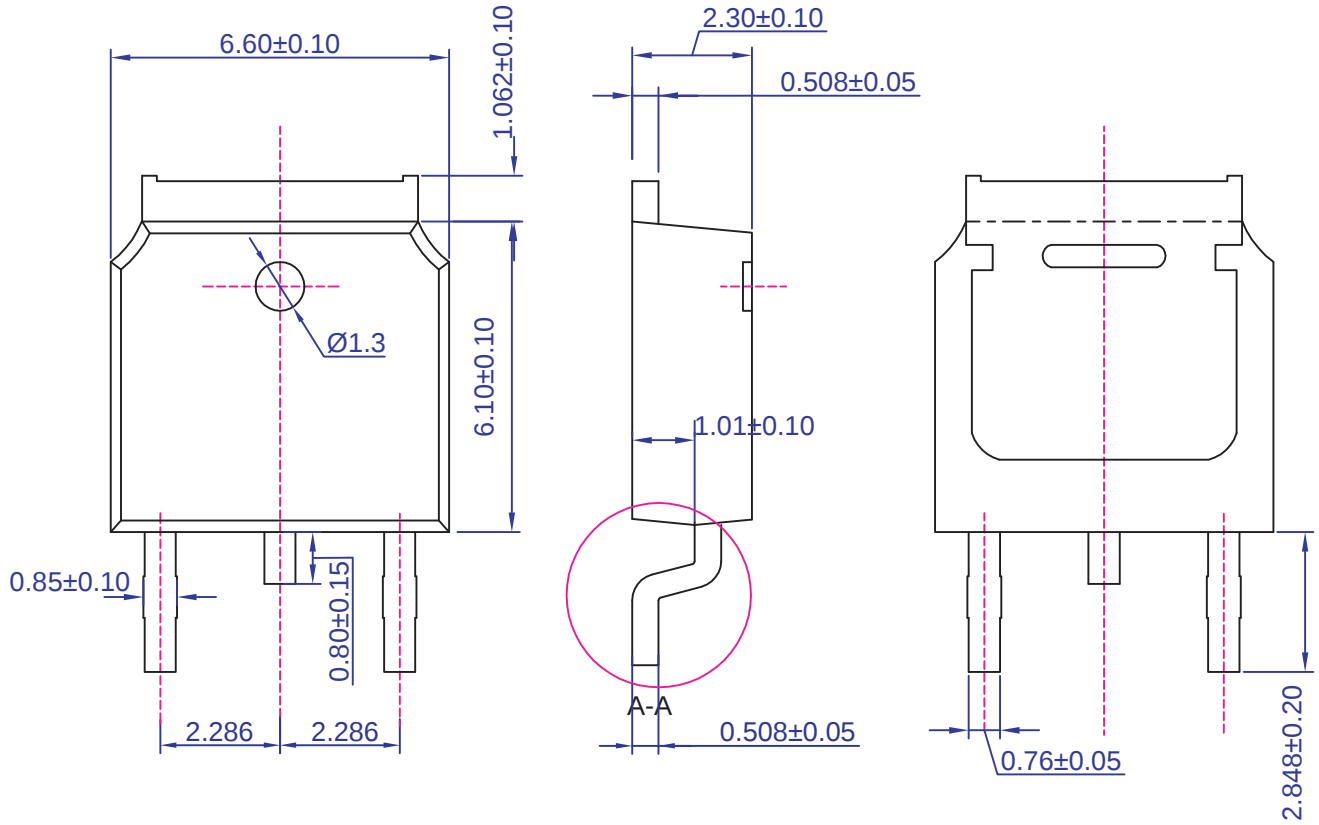


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■ Package Dimension

TO-252

Units: mm



A-A

