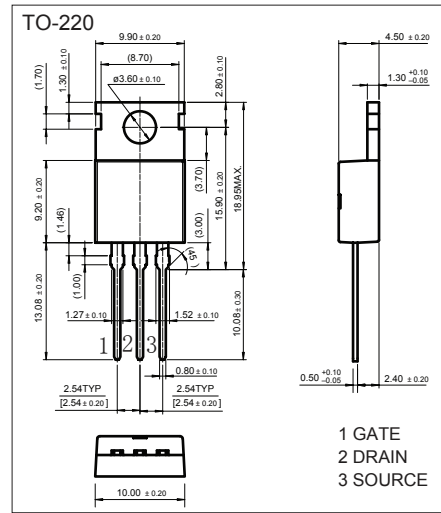


N-Channel Trench Power MOSFET

RCP55N06

■ Features

- $V_{DS} (V) = 60V$
- $I_D = 50A$
- $R_{DS(ON)} < 18m\Omega @ V_{GS} = 10V$



■ 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	I_D	$T_C = 25^\circ C$	50
		$T_C = 100^\circ C$	35
Pulsed Drain Current (Note 1)	I_{DM}	180	A
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: $T_J=25^\circ C, V_{DD}=30V, V_G=10V, R_G=25\Omega$

N-Channel Trench Power MOSFET

RCP55N06

■ 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	2		4	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		24		nS
Reverse Recovery Charge (Note 1)	Q _{rr}	di/dt=100A/μs		30		nC
Forward Turn-on Time	t _{on}	Intrinsic turn-on time is negligible(turn-on is dominated by L _S +L _D)				

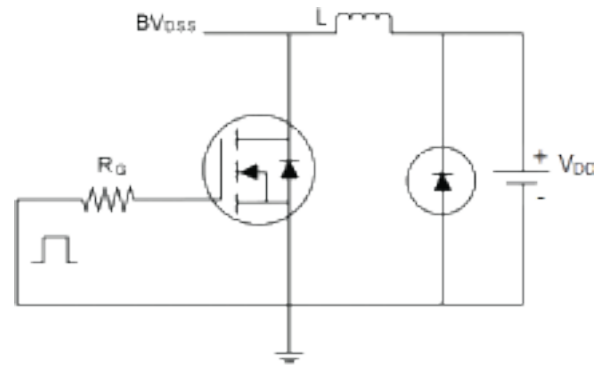
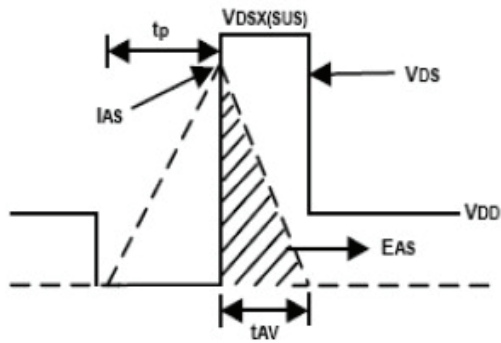
Notes 1.Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 1.5%, Starting T_J=25°C

N-Channel Trench Power MOSFET

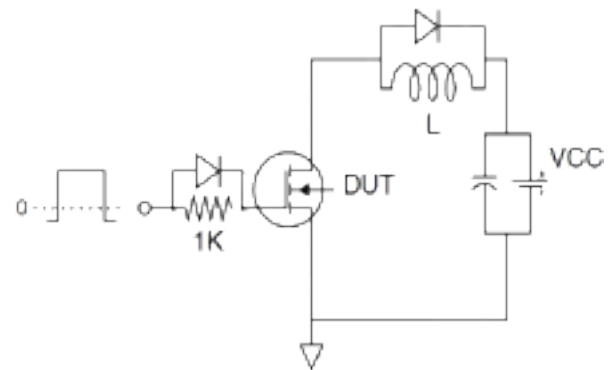
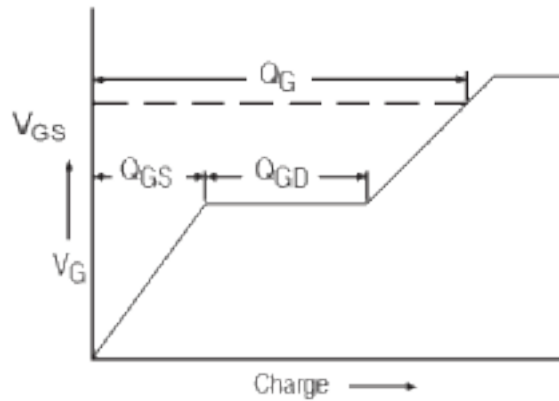
RCP55N06

■ Test Circuit

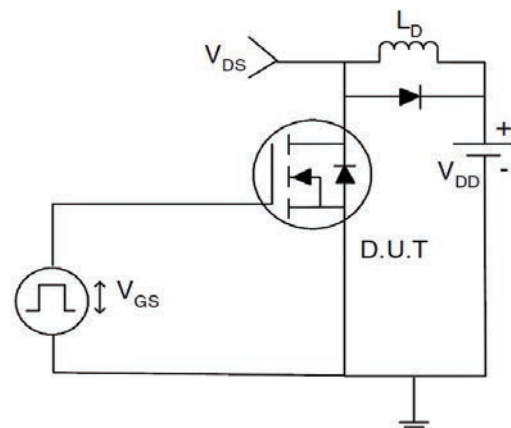
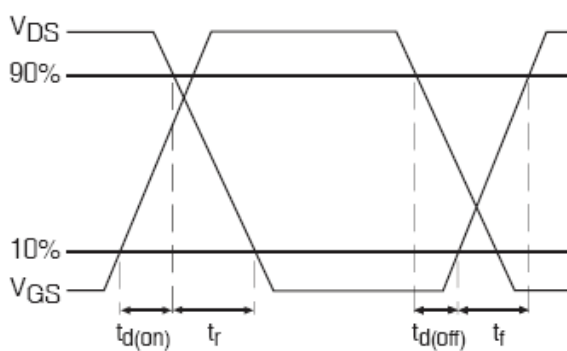
1) E_{AS} Test Circuits



2) Gate Charge Test Circuit:



3) Switch Time Test Circuit:



N-Channel Trench Power MOSFET

RCP55N06

■ Typical Electrical And Thermal Characteristics (Curves)

Figure1. Output Characteristics

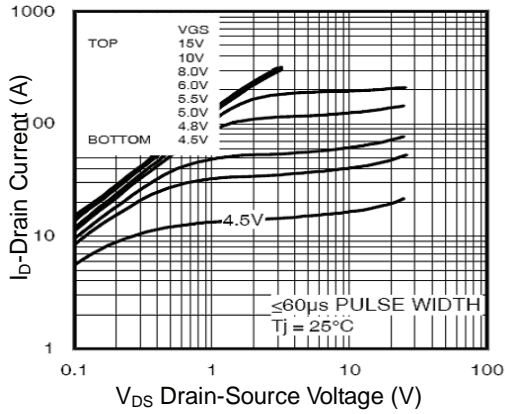


Figure2. Transfer Characteristics

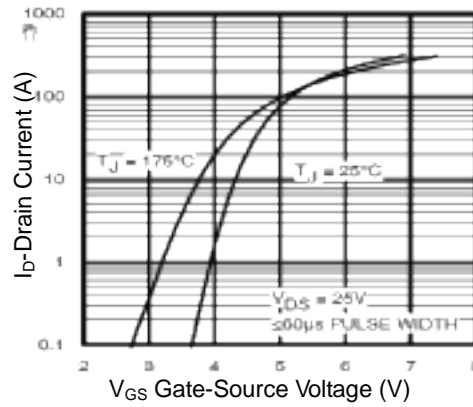


Figure3. BVDS vs Junction Temperature

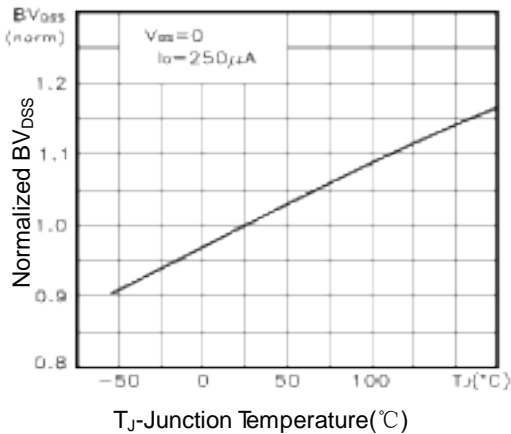


Figure4. ID vs Junction Temperature

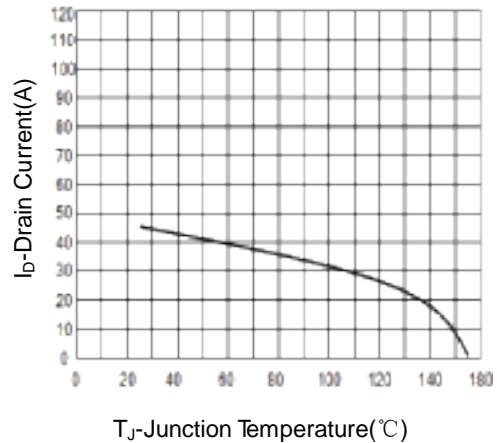


Figure5. VGS(th) vs Junction Temperature

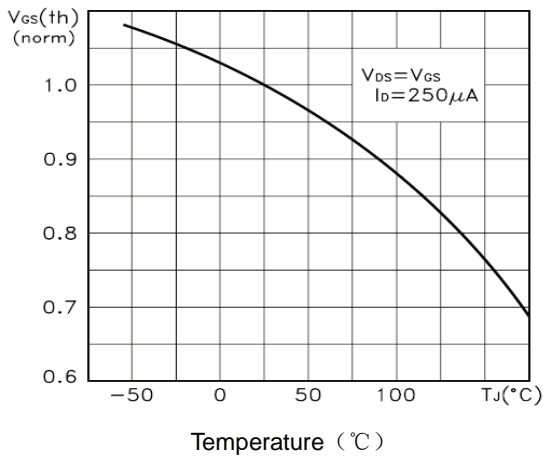
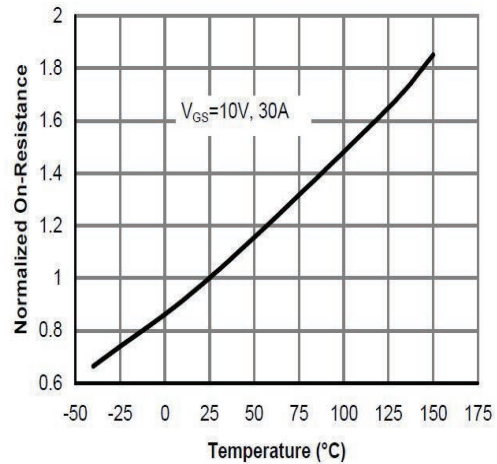


Figure6. Rds(on) Vs Junction Temperature



N-Channel Trench Power MOSFET

RCP55N06

Figure7. Gate Charge

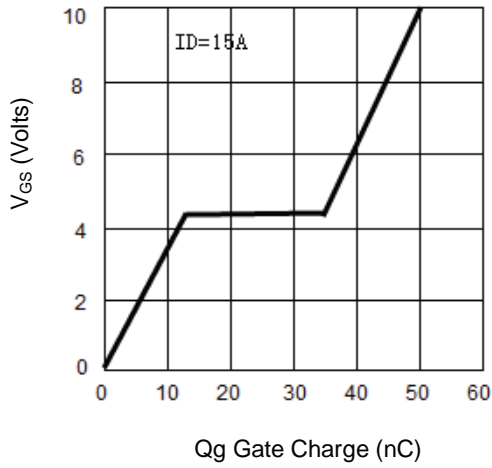


Figure8. Capacitance vs Vds

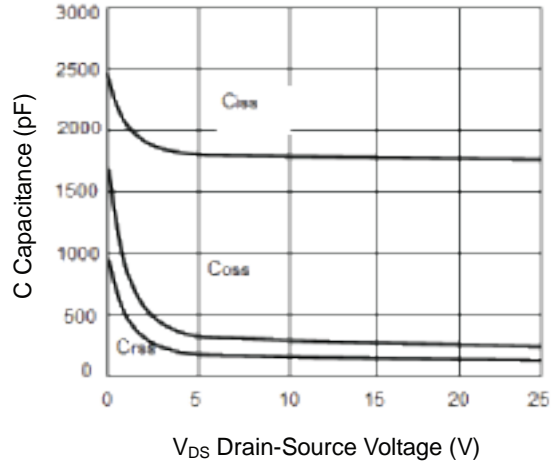


Figure9. Source- Drain Diode Forward

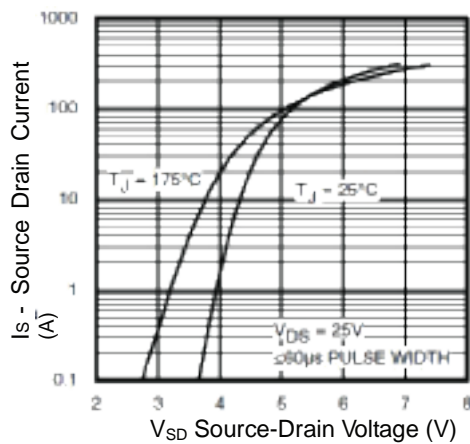


Figure10. Safe Operation Area

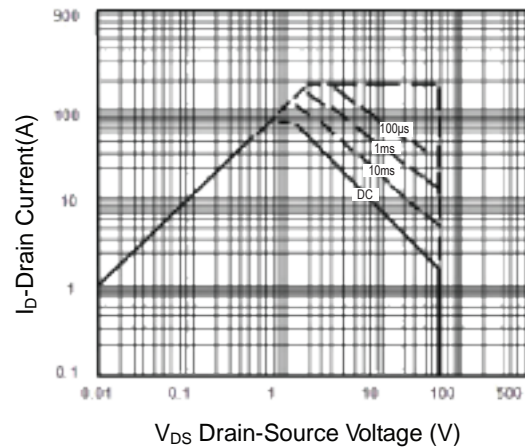


Figure11. Normalized Maximum Transient Thermal Impedance

