

Descriptions

These N-channel MOSFET are produced using advanced plane MOSFET Technology, which provides Low on-state resistance, high switching performance and excellent quality. These devices are suitable device for SMPS, high Speed switching and general purpose applications.

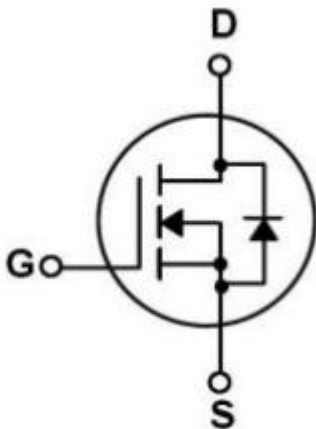
Features

- $V_{DS} = 400V$
- $I_D = 20A$ @ $V_{GS} = 10V$
- $R_{DS(ON)} (Typ) = 0.23 \Omega$ @ $V_{GS} = 10V$

Applications

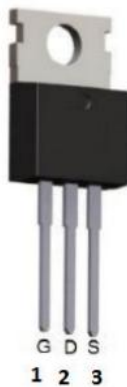
- Power Supply
- PFC
- High Current, High Speed Switching

Equivalent Circuit



Pinning

TO-220



PIN1:Gate PIN 2:Drain PIN 3:Source

Absolute Maximum Ratings(Ta=25°C)

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	400	V
Drain Current	$I_D(T_C=25^{\circ}\text{C})$	20	A
Drain Current	$I_D(T_C=100^{\circ}\text{C})$	13	A
Drain Current - Pulsed	I_{DP}	80	A
Gate-Source Voltage	V_{GS}	± 20	V
Single Pulsed Avalanche Energy	E_{AR}	28	mJ
Repetitive Avalanche Energy	E_{AS}	1110	mJ
Avalanche Current	I_{AR}	20	A
Power Dissipation	$P_D(T_C=25^{\circ}\text{C})$	200	W
Junction Temperature Range	T_j	150	$^{\circ}\text{C}$
Storage Temperature Range	T_{stg}	-55~150	$^{\circ}\text{C}$
Thermal Resistance Junction-Ambient	R_{thJA}	40	$^{\circ}\text{C/W}$
Thermal Resistance Junction-Case	R_{thJC}	0.63	$^{\circ}\text{C/W}$

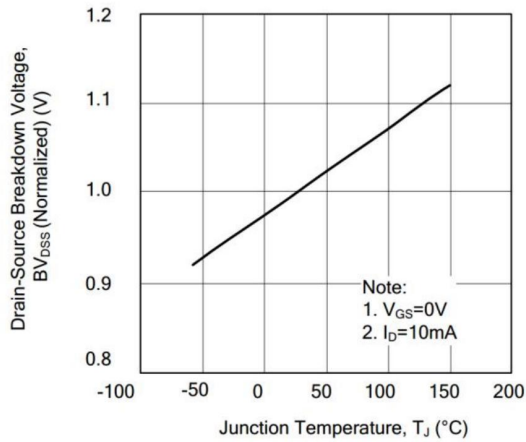
Electrical Characteristics(Ta=25°C)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	V_{DS}	$V_{GS}=0V$ $I_D=250\mu A$	400			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=400V$ $V_{GS}=0V$			1.0	μA
		$V_{DS}=400V$ $T_C=125^{\circ}\text{C}$			10	
Gate-Body Leakage Current, Forward	I_{GSS}	$V_{GS}=\pm 20V$ $V_{DS}=0V$			± 100	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}$ $I_D=250\mu A$	2.0		4.0	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V$ $I_D=10A$		0.23	0.40	Ω
Input Capacitance	C_{iss}	$V_{DS}=25V$ $V_{GS}=0V$ $f=1.0\text{MHz}$		2700		pF
Output Capacitance	C_{oss}			400		
Reverse Transfer Capacitance	C_{rss}			40		
Total Gate Charge	Q_g	$V_{DS}=320V$ $I_D=20A$ $V_{GS}=10V$		40		nC
Gate-Source Charge	Q_{gs}			15		
Gate-Drain Charge	Q_{gd}			17		

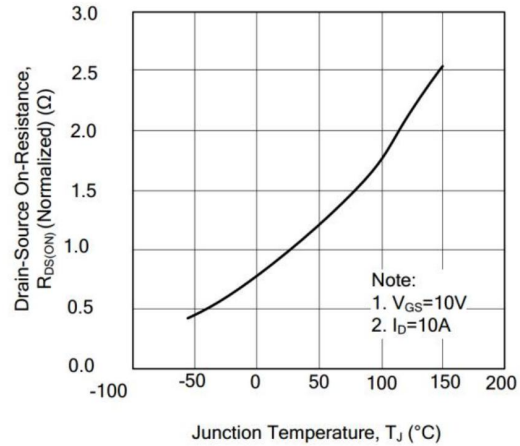
Electrical Characteristics(Ta=25°C)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Turn-On Delay Time	$t_{d(on)}$	$V_{DD}=320V \quad I_D=20A$ $R_G=25\Omega$		45		ns
Turn-On Rise Time	t_r			90		
Turn-Off Delay Time	$t_{d(off)}$			100		
Turn-Off Fall Time	t_f			60		
Maximum Continuous Drain-Source Diode Forward Current	I_S				20	A
Maximum Pulsed Drain-Source Diode Forward Current	I_{SM}				80	A
Drain-Source Diode Forward Voltage	V_{SD}	$V_{GS} = 0V, \quad I_S = 20A$			1.4	V
Reverse Recovery Time	t_{rr}	$V_{GS} = 0V, \quad I_S = 20A,$ $dI_F/dt = 100 A/\mu s$		290		nS
Reverse Recovery Charge	Q_{rr}			4000		nC

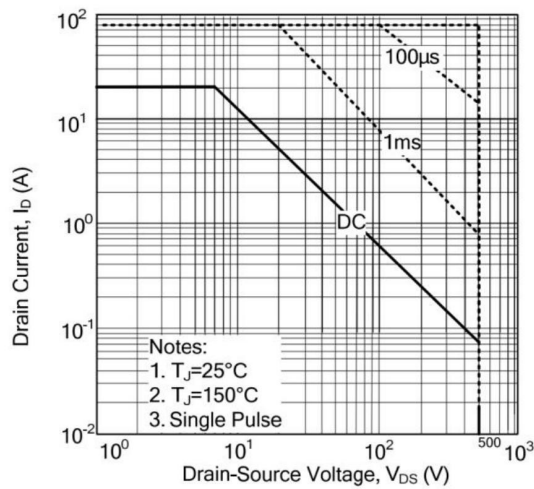
Electrical Characteristic Curve



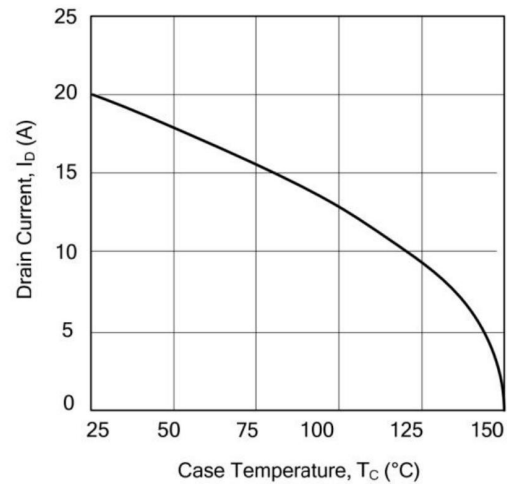
1. Breakdown Voltage Variation vs. Temperature



2. On-Resistance Junction Temperature

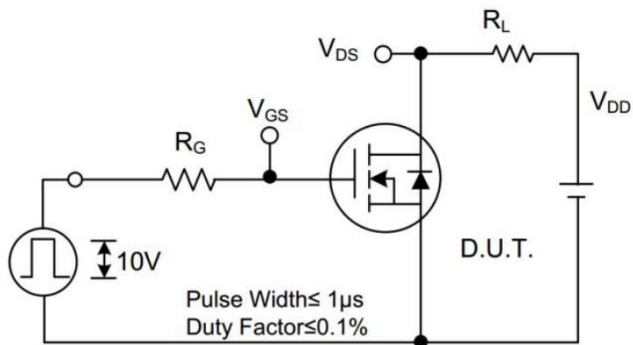


3. Safe Operating Area

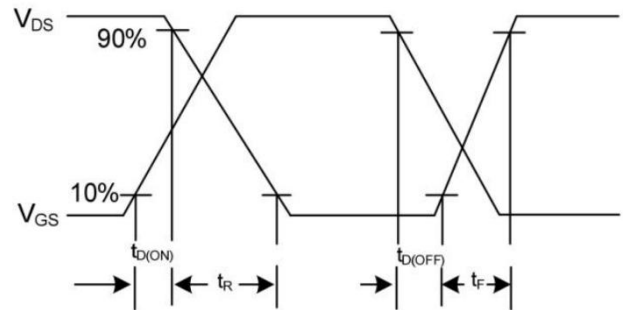


4. Maximum Drain Current vs. Case Temperature

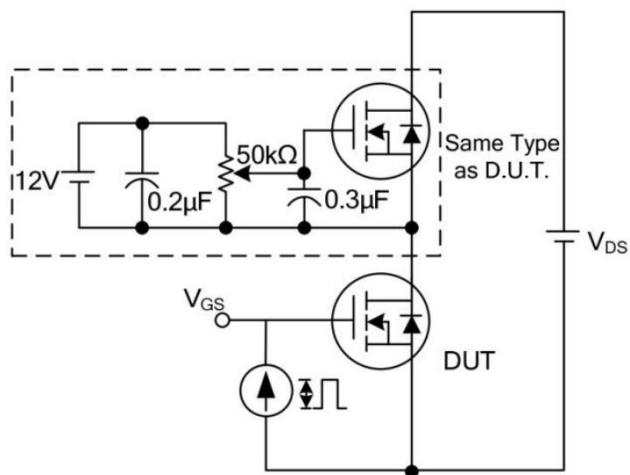
Test Circuits and Waveforms



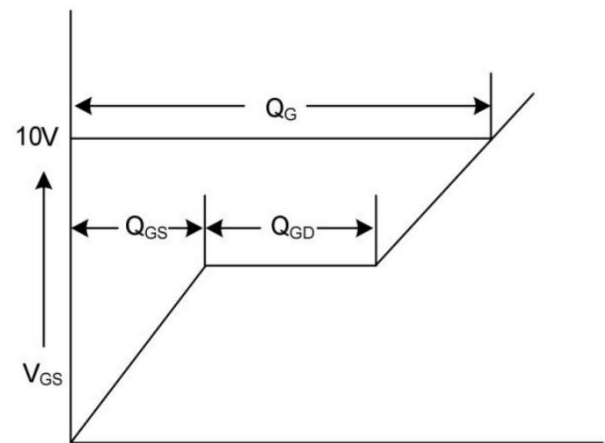
Switching Test Circuit



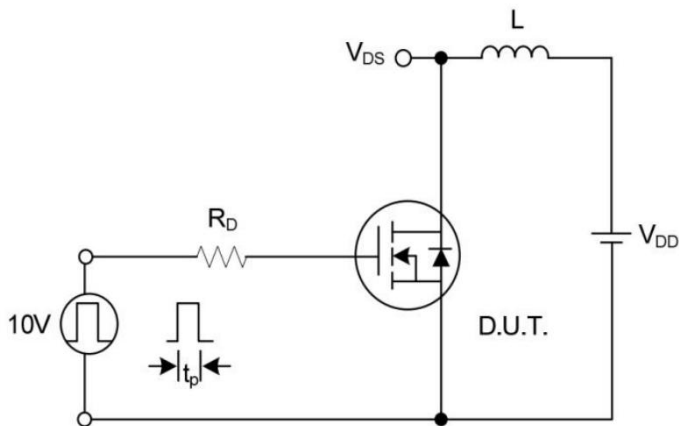
Switching Waveforms



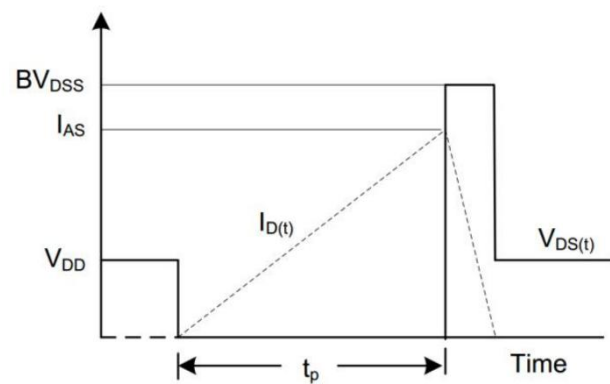
Gate Charge Test Circuit



Gate Charge Waveform

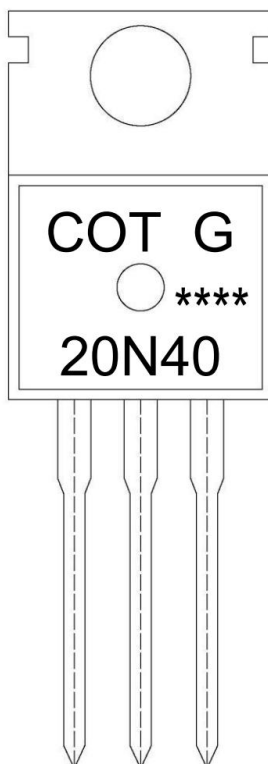


Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

Marking Instructions



Note:

COT: Company Logo

G: Halogen Free

20N40: Product Type.

****: Lot No. Code, code change with Lot No.

Packaging SPEC

REEL INFORMATION

Package Type	Units					Dimension (unit: mm ³)		
	Units/Bag	Bags/Inner Box	Units/Inner Box	Inner Boxes/Outer Box	Units/Outer Box	Bag	Inner Box	Outer Box
TO-220	200	10	2,000	5	10,000	135×190	237×172×102	560×245×195

TUBE INFORMATION

Package Type	Units					Dimension (unit: mm ³)		
	Units/Tube	Tubes/Inner Box	Units/Inner Box	Inner Boxes/Outer Box	Units/Outer Box	Tube	Inner Box	Outer Box
TO-220	50	20	1,000	5	5,000	532×31.4×5.5	555×164×50	575×290×180

Package Outline Dimensions

TO-220

单位: mm

