



DESCRIPTION

The AM0780AH is available in TO-220F package.

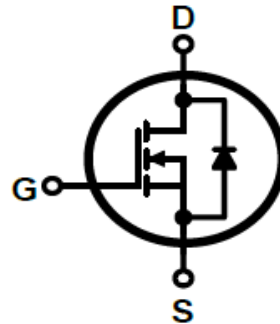
FEATURES

- High voltage: $BV_{DSS}=800V$
- Low gate charge: $Q_g=40nC$ (Typ.)
- Low drain-source On resistance:
 $R_{DS(ON)}=1.8\Omega$ (Max.)
- 100% avalanche tested
- Available in TO-220F Packages

ORDERING INFORMATION

Package Type	Part Number	
TO-220F SPQ: 50pcs/Tube	T3F	AM0780AHT3FU
		AM0780AHT3FVU
Note	V: Halogen free Package U: Tube	
AiT provides all RoHS products		

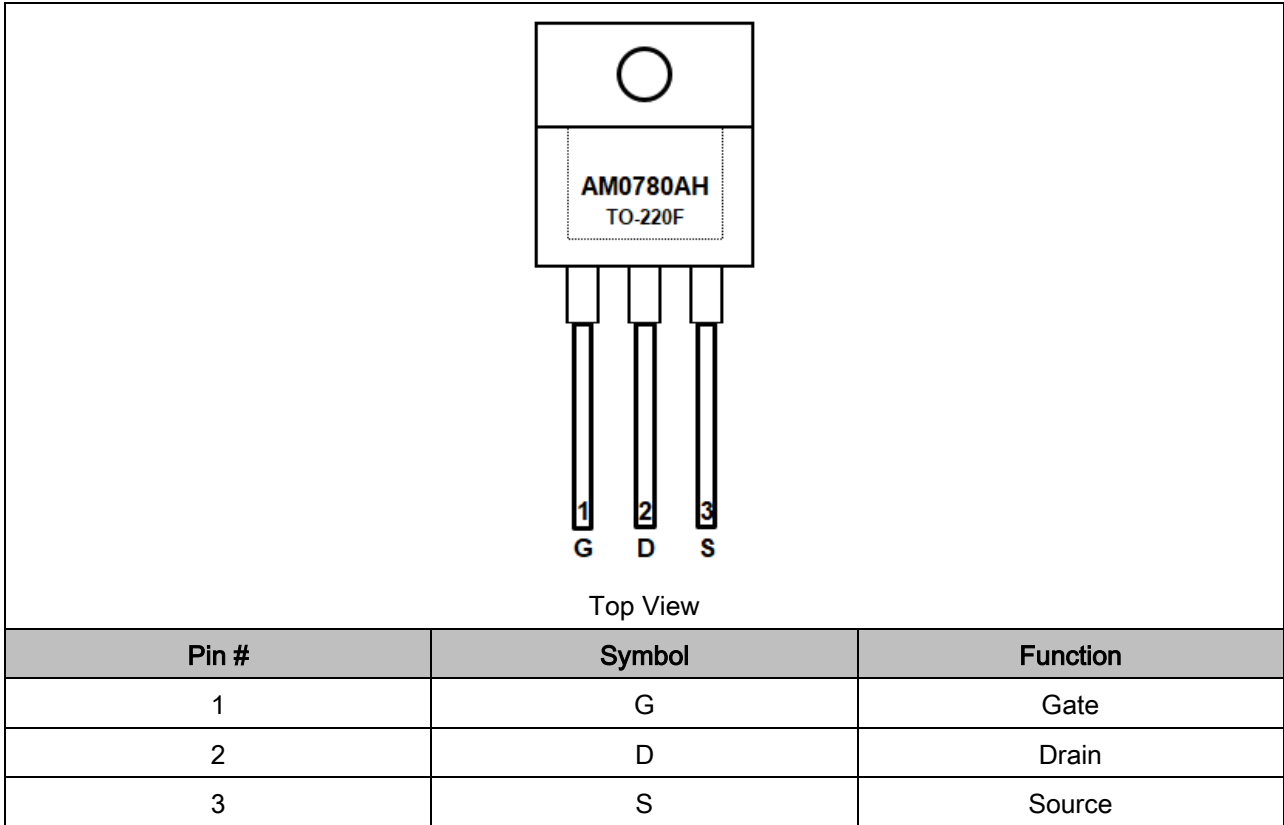
TYPICAL APPLICATION



Schematic diagram



PIN DESCRIPTION





ABSOLUTE MAXIMUM RATINGS

$T_C = 25^\circ\text{C}$, unless otherwise noted

V_{DSS} , Drain-Source Voltage	800V
V_{GSS} , Gate-Source Voltage	$\pm 30\text{V}$
I_D , Drain Current (DC) ^{NOTE1}	$T_C=25^\circ\text{C}$ 7A
	$T_C=100^\circ\text{C}$ 5.1A
I_{DM} , Drain Current (Pulsed) ^{NOTE1}	28A
E_{AS} , Single Pulsed Avalanche Energy ^{NOTE2}	300mJ
P_D , Power Dissipation	60W
T_J , Junction Temperature	150°C
T_{STG} , Storage Temperature Range	-55°C ~ 150°C

Stress beyond above listed "Absolute Maximum Ratings" may lead permanent damage to the device. These are stress ratings only and operations of the device at these or any other conditions beyond those indicated in the operational sections of the specifications are not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

THERMAL CHARACTERISTIC

Parameter	Symbol	Value	Units
Thermal Resistance, Junction to Case	R_{thJC}	Max. 2.08	°C/W
Thermal Resistance, Junction to Ambient	R_{thJA}	Max. 120	°C/W



ELECTRICAL CHARACTERISTICS

T_C= 25°C, unless otherwise noted

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _D =250μA	800	-	-	V
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	2	-	4	V
Drain-Source Cut-Off Current	I _{DSS}	V _{DS} =800V, V _{GS} =0V	-	-	1	μA
Gate Leakage Current	I _{GSS}	V _{GS} =±30V, V _{DS} =0V	-	-	±100	nA
Drain-Source On-Resistance	R _{DS(ON)}	V _{GS} =10V, I _D =3.5A	-	1.4	1.8	Ω
Forward Transfer Conductance ^{NOTE3}	G _{FS}	V _{DS} =10V, I _D =3.5A	-	5.0	-	S
Input Capacitance	C _{iss}	V _{DS} =25V, V _{GS} =0V, f=1MHz	-	1100	-	pF
Output Capacitance	C _{oss}		-	110	-	
Reverse Transfer Capacitance	C _{rss}		-	11	-	
Turn-on Delay Time ^{NOTE3,4}	t _{d(on)}	V _{DD} =400V, I _D =7A, R _G =25Ω	-	30	-	ns
Rise Time ^{NOTE3,4}	t _r		-	67	-	
Turn-Off Delay Time ^{NOTE3,4}	t _{d(off)}		-	58	-	
Fall Time ^{NOTE3,4}	t _f		-	38	-	
Total Gate Charge ^{NOTE3,4}	Q _g	V _{DS} =640V, V _{GS} =10V, I _D =7A	-	26	-	nC
Gate-Source Charge ^{NOTE3,4}	Q _{gs}		-	7.0	-	
Gate-Drain Charge ^{NOTE3,4}	Q _{gd}		-	8.0	-	
Source-Drain Diode Ratings and Characteristics						
Source Current (DC)	I _S	Integral reverse diode in the MOSFET	-	-	8	A
Source Current (Pulsed)	I _{SM}		-	-	32	A
Forward Voltage	V _{SD}	V _{GS} =0V, I _S =7A	-	-	1.4	V
Reverse Recovery Time ^{NOTE3,4}	t _{rr}	I _S =7A, V _{GS} =0V	-	310	-	ns
Reverse Recovery Charge ^{NOTE3,4}	Q _{rr}	dI _F /dt=100A/us	-	0.53	-	μC

NOTE1: Repeated rating: Pulse width limited by safe operating area

NOTE2: L=30mH, I_{AS}=4.5A, V_{DD}=50V, R_G=25Ω, Starting T_J=25°C

NOTE3: Pulse test: Pulse width ≤ 300us, Duty cycle ≤ 2%

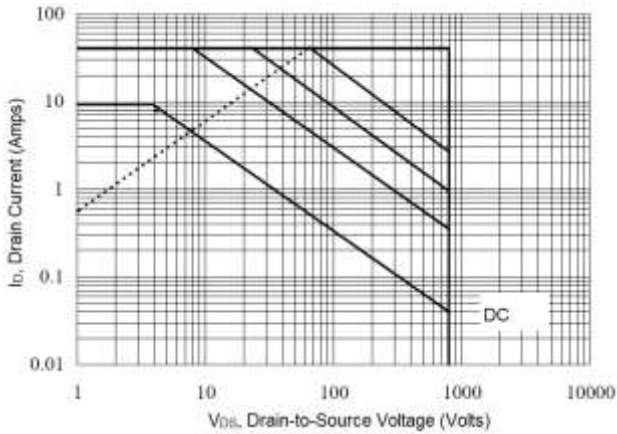
NOTE4: Essentially independent of operating temperature typical characteristics



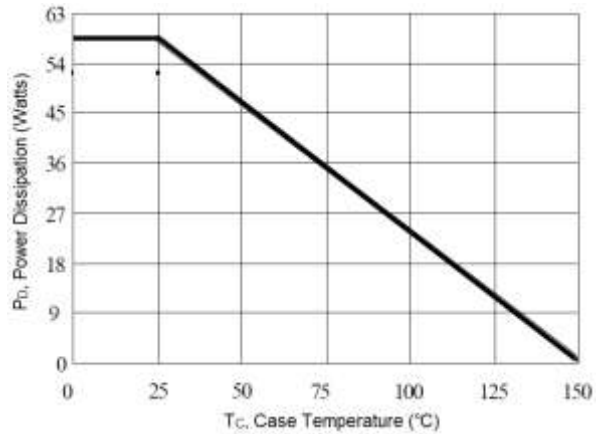
TYPICAL ELECTRICAL CHARACTERISTICS

T_J = 25°C, unless otherwise noted

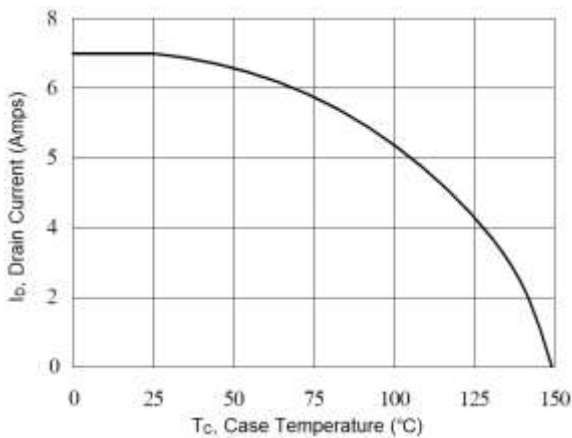
1. Maximum Forward Bias Safe Operating Area



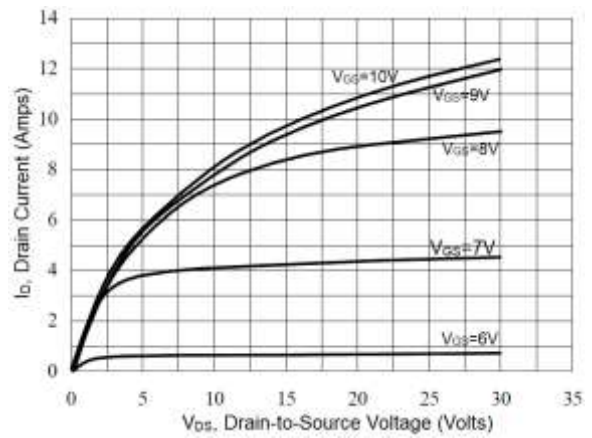
2. Maximum Power Dissipation vs. Case Temperature



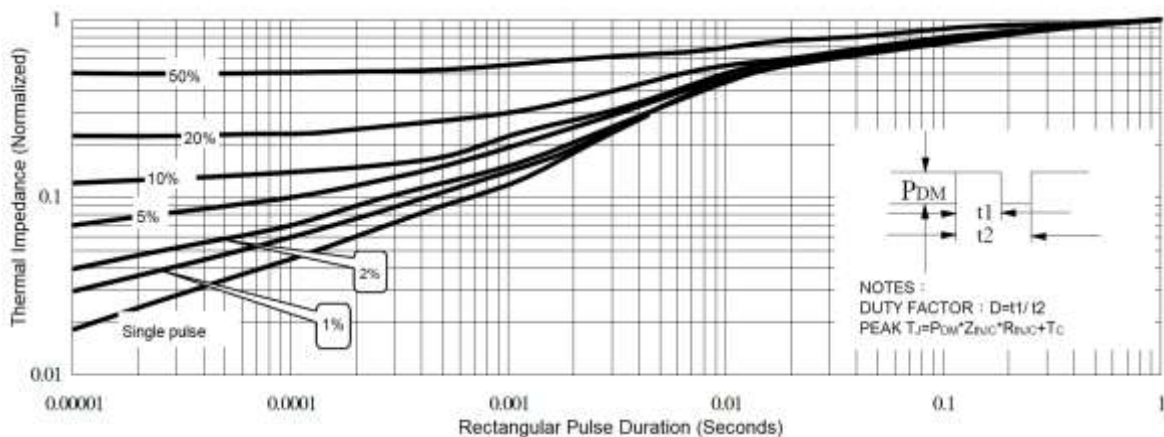
3. Maximum Continuous Drain Current vs. Case Temperature



4. Typical Output Characteristics

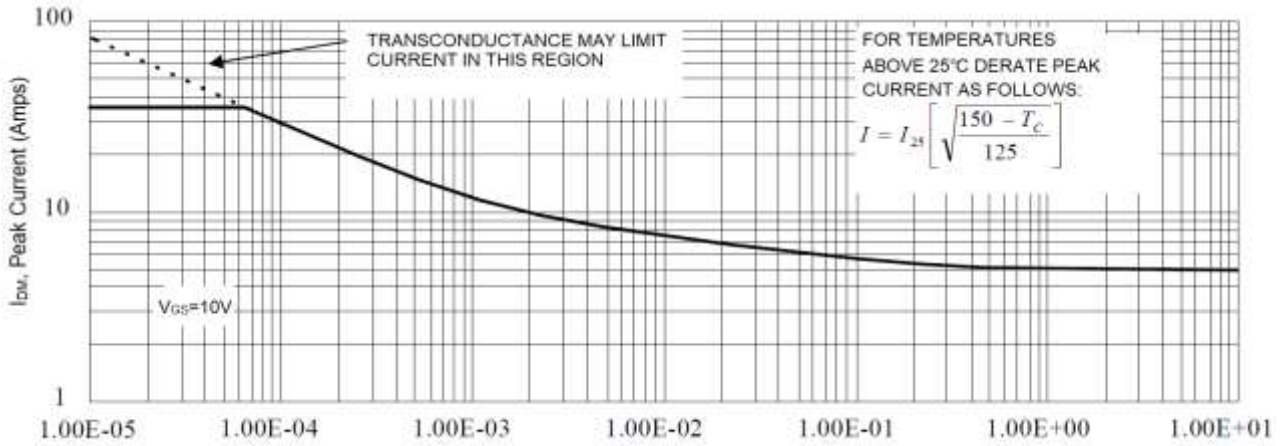


5. Maximum Effective Thermal Impedance, Junction to Case

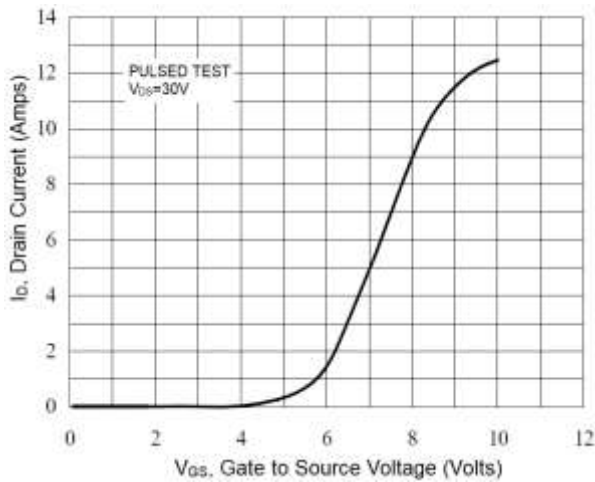




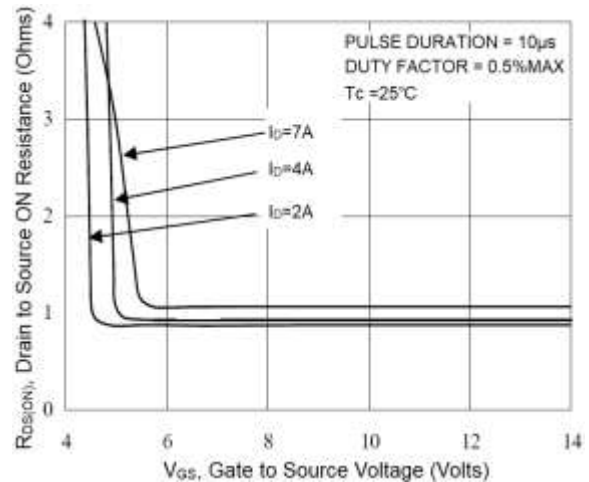
6. Maximum Peak Current Capability



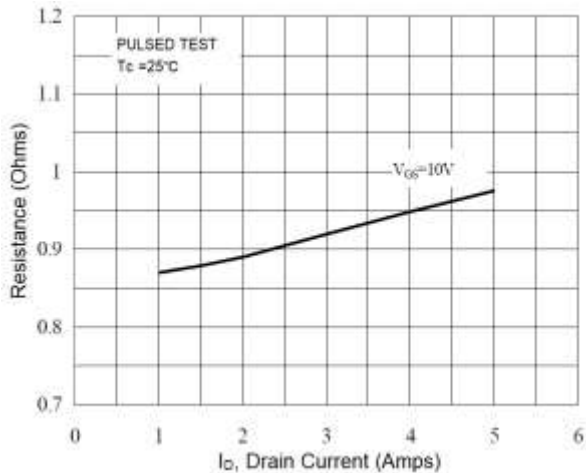
7. Typical Transfer Characteristics



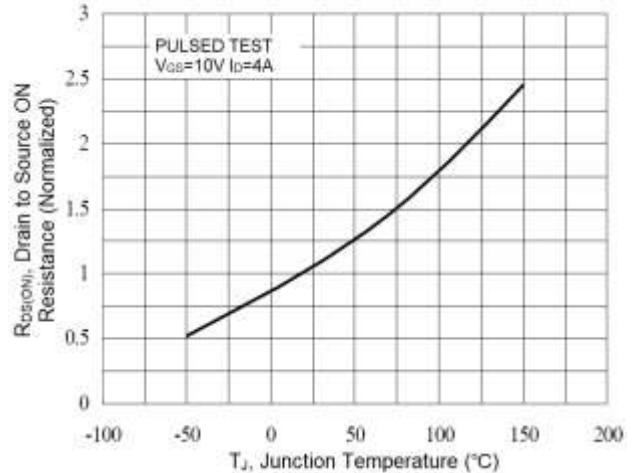
8. Typical Drain to Source ON Resistance vs Gate Voltage and Drain Current



9. Typical Drain to Source ON Resistance vs. Drain Current

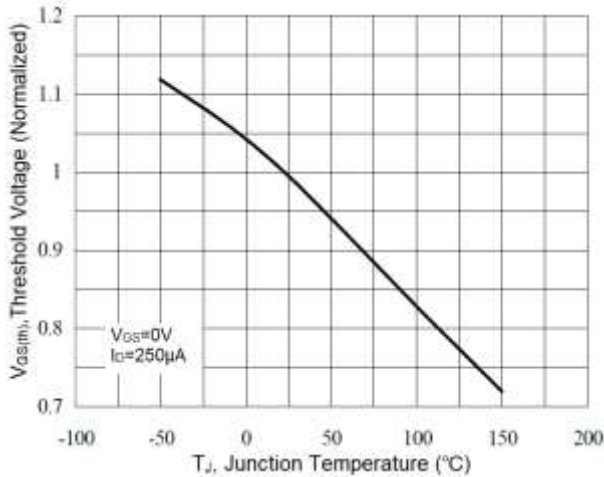


10. Typical Drain to Source on Resistance vs. Junction Temperature

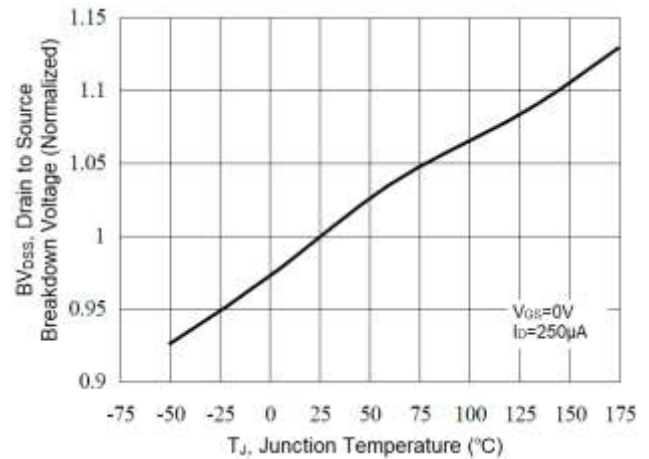




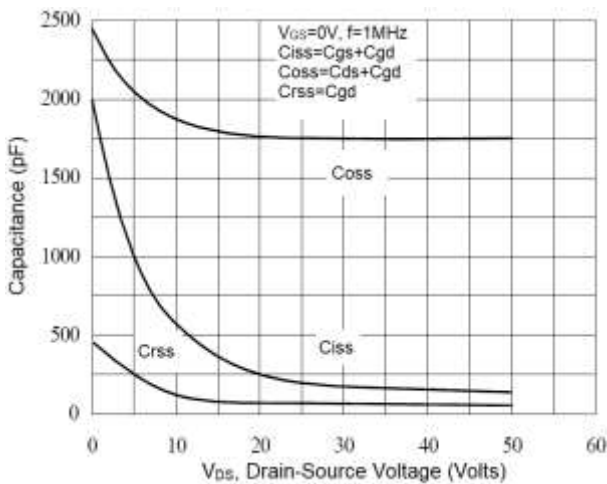
11. Typical Threshold Voltage vs. Junction Temperature



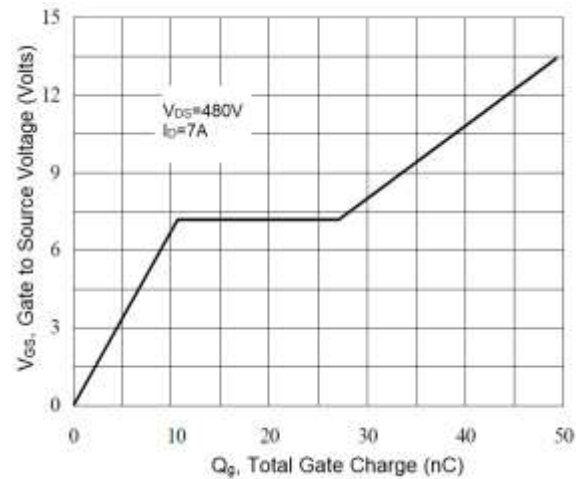
12. Typical Breakdown Voltage vs. Junction Temperature



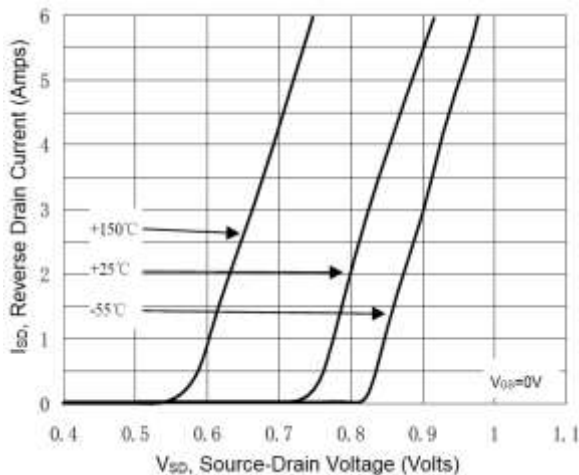
13. Typical Capacitance vs. Drain to Source Voltage



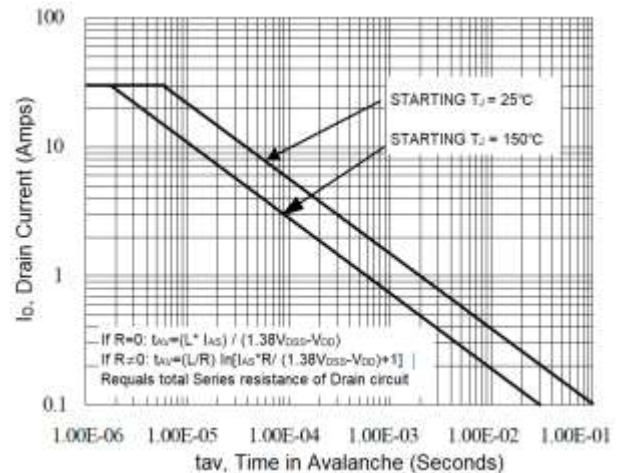
14. Typical Gate Charge vs. Gate to Source Voltage



15. Typical Body Diode Transfer Characteristics



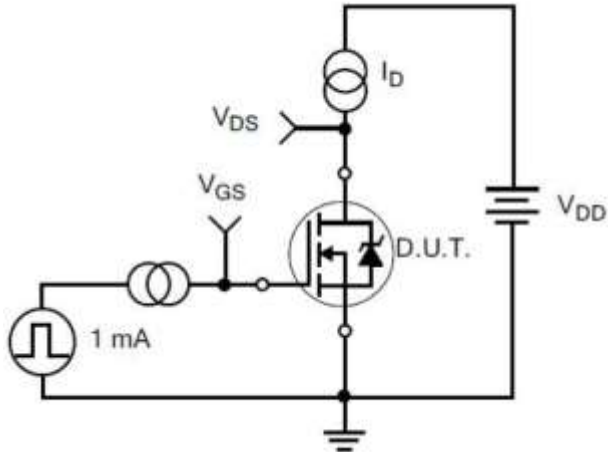
16. Unclamped Inductive Switching Capability



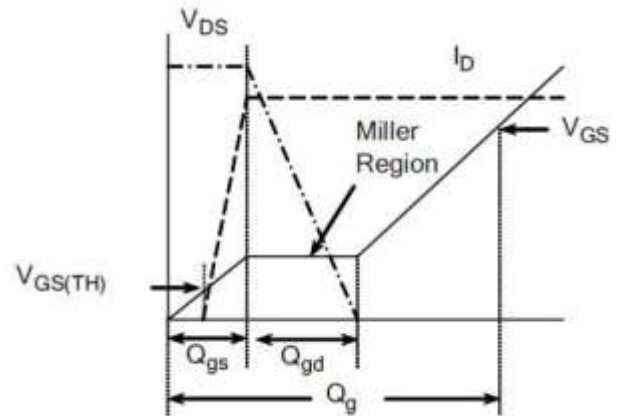


TEST CIRCUIT AND WAVEFORM

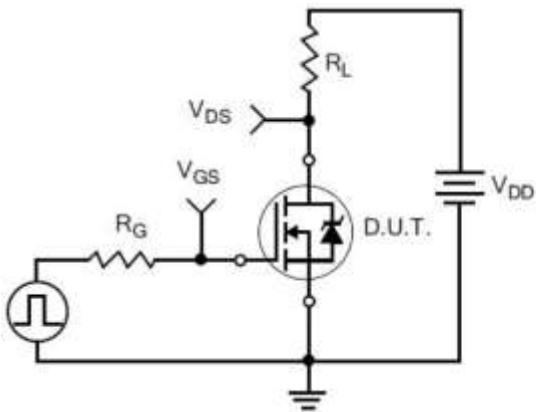
1. Gate Charge Test Circuit



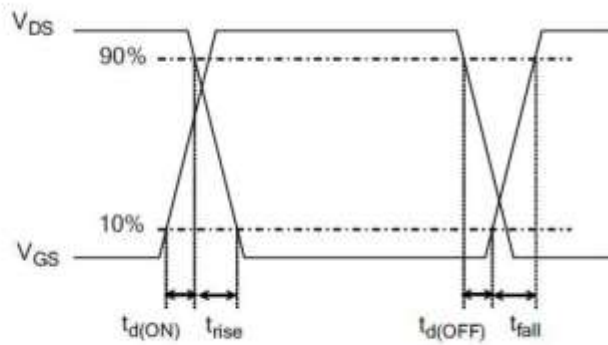
2. Gate Charge Waveform



3. Resistive Switching Test Circuit

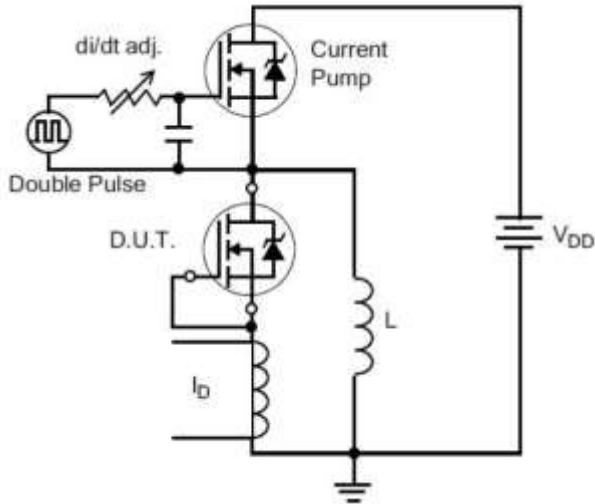


4. Resistive Switching Waveform

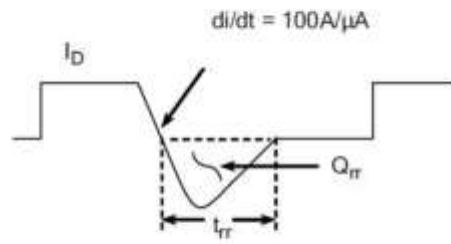




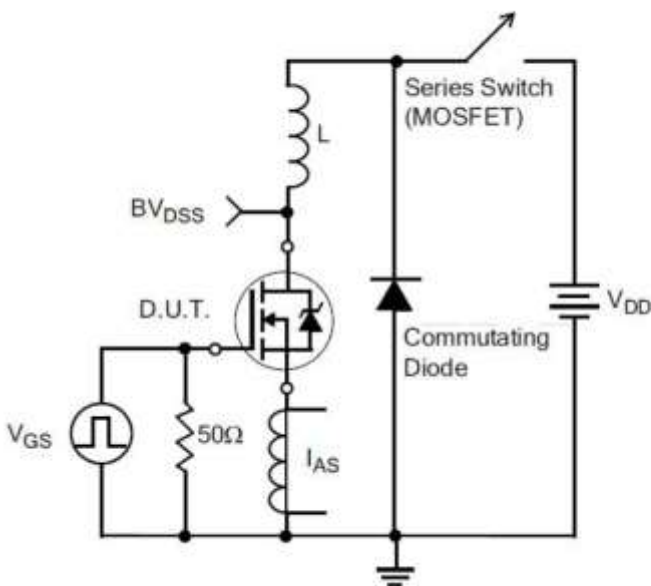
5. Diode Reverse Recovery Test Circuit



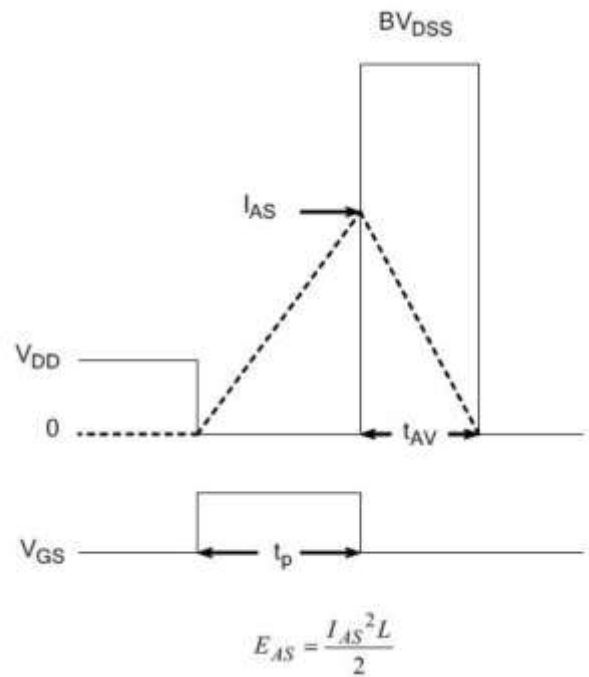
6. Diode Reverse Recovery Waveform



7. Unclamped Inductive Switching Test Circuit



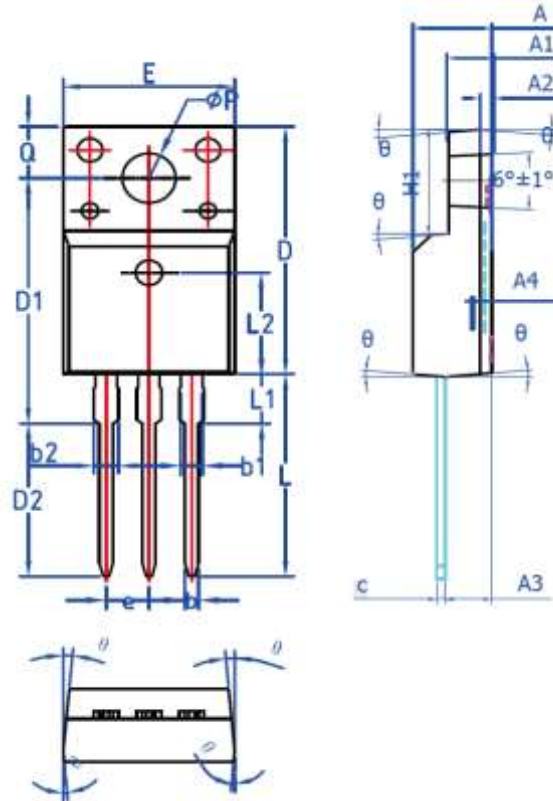
8. Unclamped Inductive Switching Waveform





PACKAGE INFORMATION

Dimension in TO-220F Package (Unit: mm)



Symbol	Min.	Max.
A	4.50	4.90
A1	2.34	2.74
A2	0.70 REF	
A3	2.56	2.96
b	0.70	0.90
b1	1.17	1.25
b2	1.17	1.25
c	0.45	0.60
D	15.67	16.07
D1	15.55	15.95
D2	10.00	10.40
E	9.96	10.36
e	2.54 BSC	
H1	6.48	6.88
L	12.68	13.28
L1	-	3.50
L2	6.50 REF	
ΦP	3.08	3.28
Q	3.20	3.40
θ	1°	5°
A4	0.53	0.59



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