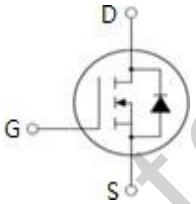
FEATURES

- Fast switching
- 100% avalanche tested
- Improved dv/dt capability

APPLICATIONS

- Switch Mode Power Supply (SMPS)
- Uninterruptible Power Supply (UPS)
- Power Factor Correction (PFC)



Absolute Maximum Ratings T_C = 25ºC, unless otherwise noted

Parameter	Symbol	Value	Unit
		TO-220	
Drain-Source Voltage (V_{GS} = 0V)	V_{DSS}	-55	V
Continuous Drain Current	I_D	-80	A
Pulsed Drain Current (note1)	I_{DM}	-260	A
Gate-Source Voltage	V_{GSS}	±20	V
Single Pulse Avalanche Energy (note2)	E_{AS}	930	mJ
Avalanche Current (note1)	I_{AR}	-38	A
Repetitive Avalanche Energy (note1)	E_{AR}	20	mJ
Power Dissipation (T_C = 25ºC)	P_D	200	W
Operating Junction and Storage Temperature Range	T_J, T_{stg}	-55 to175	ºC

Thermal Resistance

Parameter	Symbol	Value	Unit
		TO-220	
Thermal Resistance, Junction-to-Case	R_{thJC}	0.75	℃/W
Thermal Resistance, Junction-to-Ambient	R_{thJA}	62	

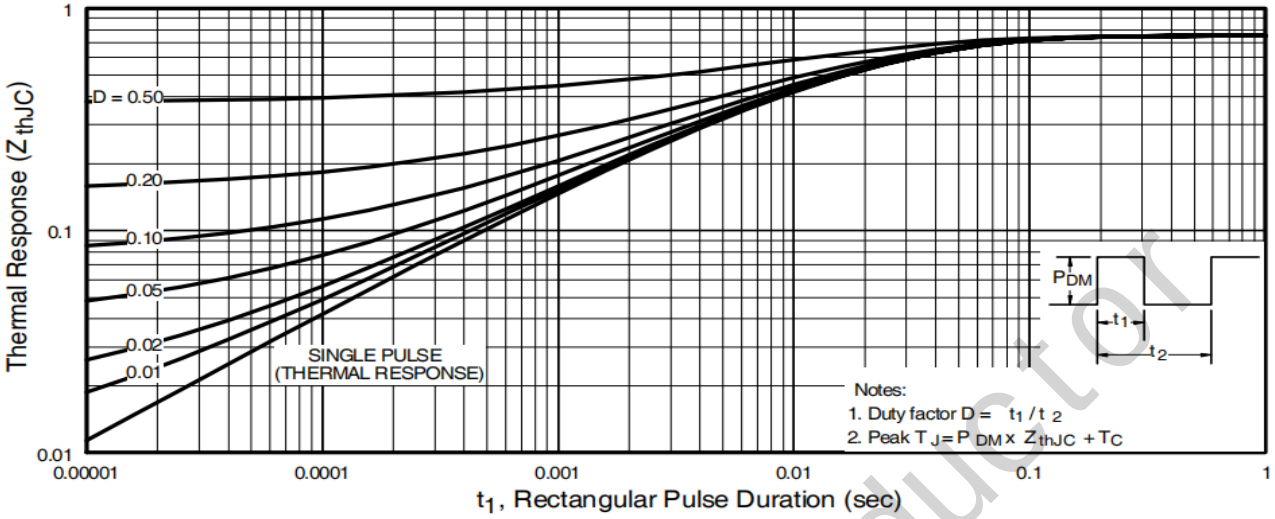
Specifications T_J = 25ºC, unless otherwise noted

Parameter	Symbol	Test Conditions	Value			Unit
			Min.	Typ.	Max.	
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D = -250μA	-55	--	--	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = -55V, V_{GS} = 0V, T_J = 25ºC	--	--	-25	μA
		V_{DS} = -44V, V_{GS} = 0V, T_J =125ºC	--	--	-250	
Gate-Source Leakage	I_{GSS}	V_{GS} = +20V,V_{DS}=0V	--	--	55	nA
		V_{GS}=-20V, V_{DS}=0V	--	--	-55	
Gate-Source Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = -250μA	-2.0	--	-4.0	V
Drain-Source On-Resistance (Note3)	$R_{DS(on)}$	V_{GS} = -10V, I_D = -38A	--	--	0.02	Ω
Forward Transconductance	gfs	V_{DS} = 10V, I_D = 28A	21	--	--	S
Dynamic						
Input Capacitance	C_{iss}	V_{GS} = 0V, V_{DS} =-25V, f = 1.0MHz	--	3400	--	pF
Output Capacitance	C_{oss}		--	1400	--	
Reverse Transfer Capacitance	C_{rss}		--	640	--	
Total Gate Charge	Q_g	V_{DD} = -44V, I_D = -38A, V_{GS} = -10V	--	180	--	nC
Gate-Source Charge	Q_{gs}		--	32	--	
Gate-Drain Charge	Q_{gd}		--	86	--	
Turn-on Delay Time	$t_{d(on)}$	VDD = -28V, ID =-38A, R_D = 0.72 Ω R_G = 2.5 Ω	--	18	--	ns
Turn-on Rise Time	t_r		--	99	--	
Turn-off Delay Time	$t_{d(off)}$		--	61	--	
Turn-off Fall Time	t_f		--	96	--	
Drain-Source Body Diode Characteristics						
Continuous Body Diode Current	I_S	T_C = 25 ºC	--	--	-74	A
Pulsed Diode Forward Current	I_{SM}		--	--	-260	
Body Diode Voltage	V_{SD}	T_J = 25ºC, I_{SD} = -38A, V_{GS} = 0V	--	--	-1.6	V
Reverse Recovery Time	t_{rr}	V_{GS} = 0V,I_S = -38A, di_F/dt = -100A /μs	--	89	130	ns
Reverse Recovery Charge	Q_{rr}		--	230	350	μC

Notes

1. Repetitive Rating: Pulse width limited by maximum junction temperature
2. I_{AS} = 30A, V_{DD} = 50V, R_G = 25 Ω, Starting T_J = 25 ºC
3. Pulse Test: Pulse width ≤ 300μs, Duty Cycle ≤ 1%

Typical Characteristics T_J = 25ºC, unless otherwise noted



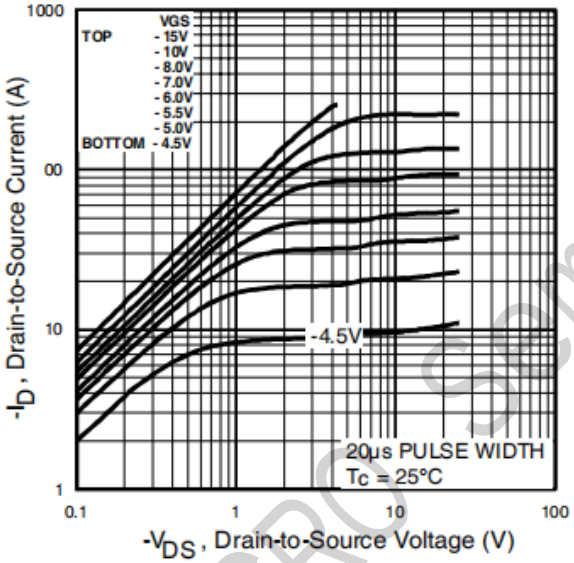


Fig 2. Typical Output Characteristics

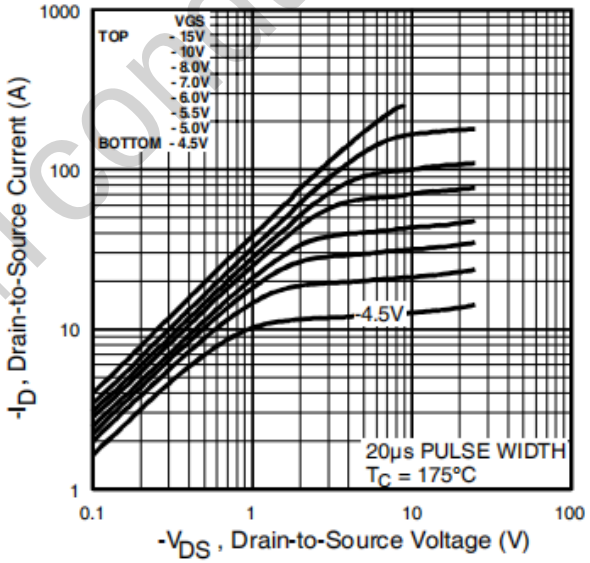


Fig 3. Typical Output Characteristics

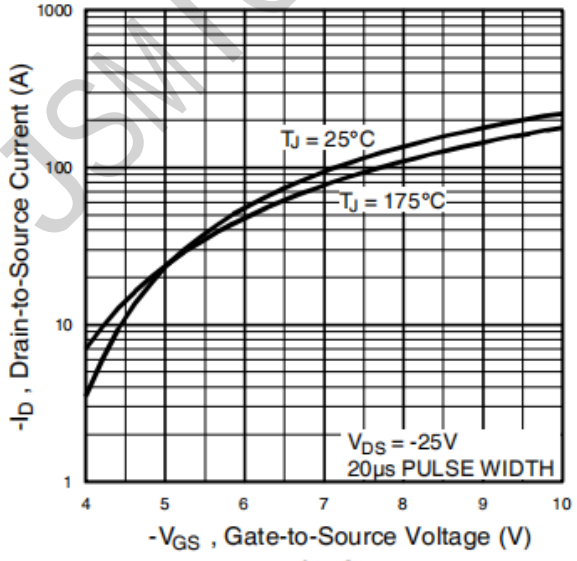


Fig 4. Typical Transfer Characteristics

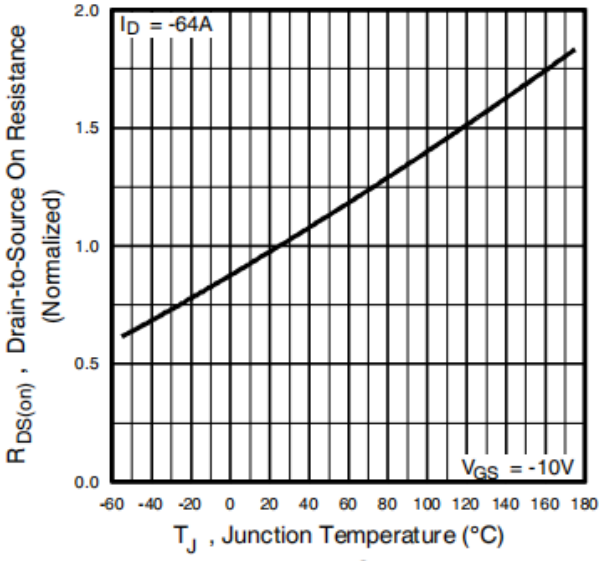


Fig 5. Normalized On-Resistance Vs. Temperature

Typical Characteristics T_J = 25ºC, unless otherwise noted

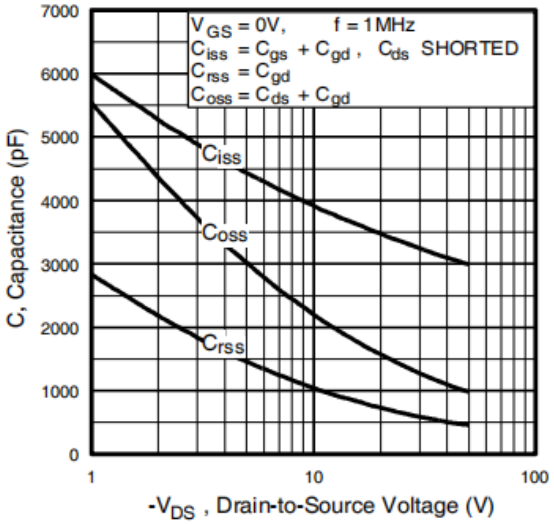


Fig 6. Typical Capacitance Vs. Drain-to-Source Voltage

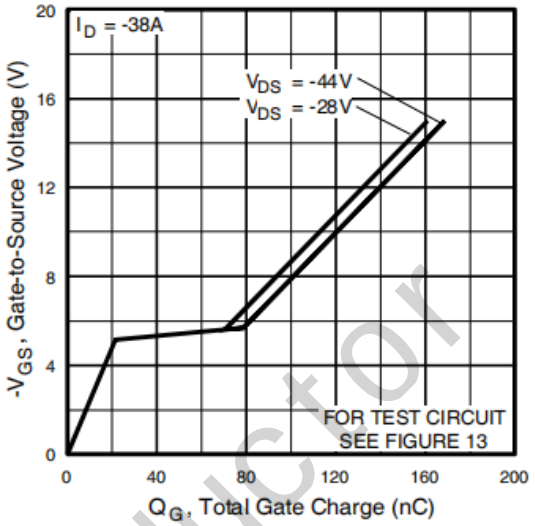


Fig 7. Typical Gate Charge Vs. Gate-to-Source Voltage

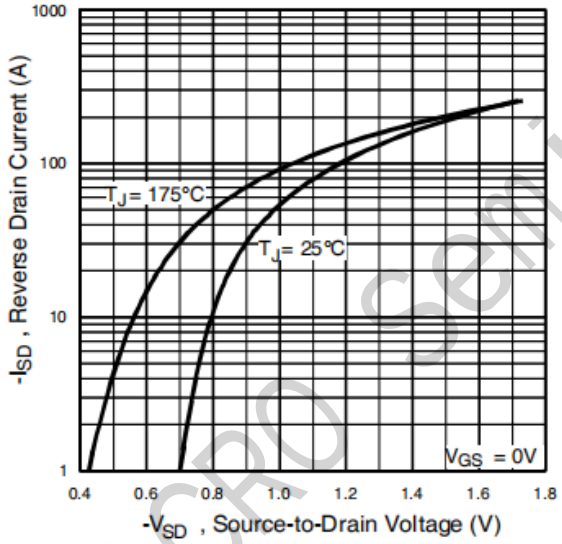


Fig 8. Typical Source-Drain Diode Forward Voltage

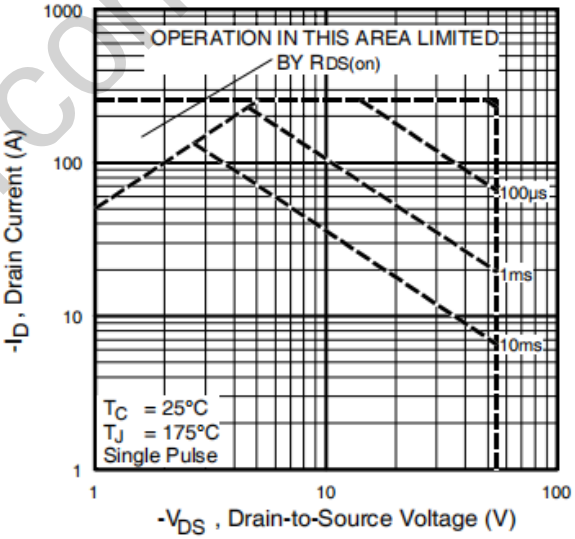


Fig 9. Maximum Safe Operating Area

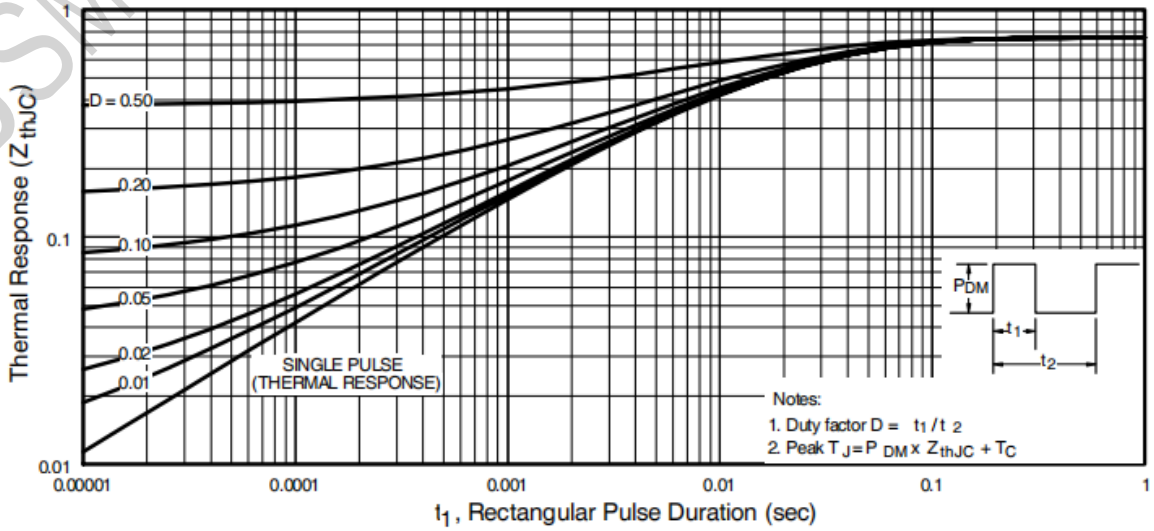


Fig 10. Maximum Effective Transient Thermal Impedance, Junction-to-Case

Typical Characteristics T_J = 25ºC, unless otherwise noted

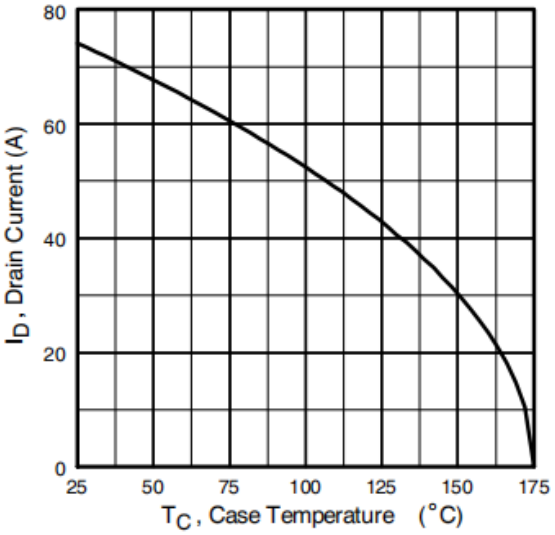


Fig 11. Maximum Drain Current Vs. Case Temperature

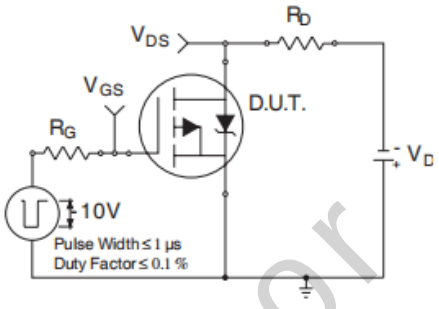


Fig 12a. Switching Time Test Circuit

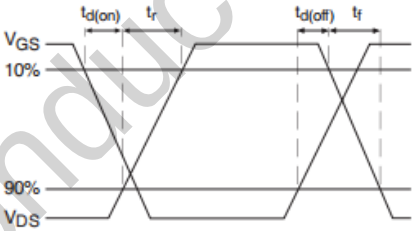


Fig 12b. Switching Time Waveforms

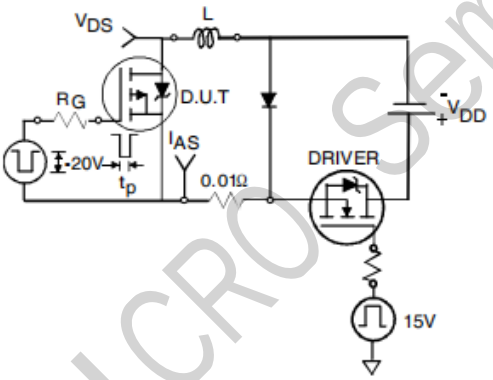


Fig 13a. Unclamped Inductive Test Circuit

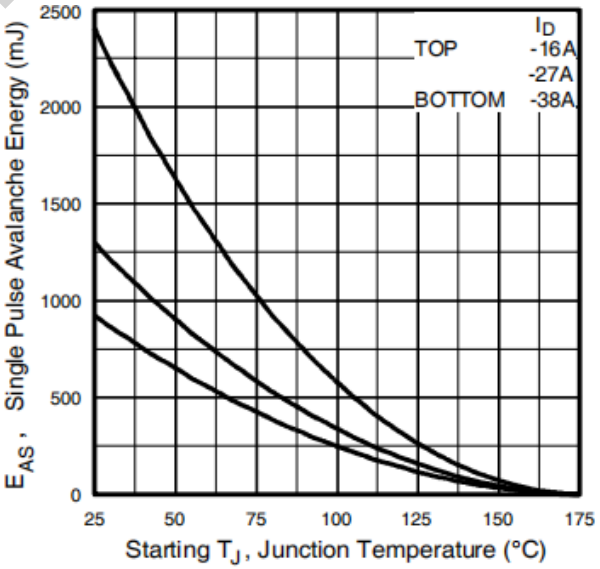


Fig 13c. Maximum Avalanche Energy Vs. Drain Current

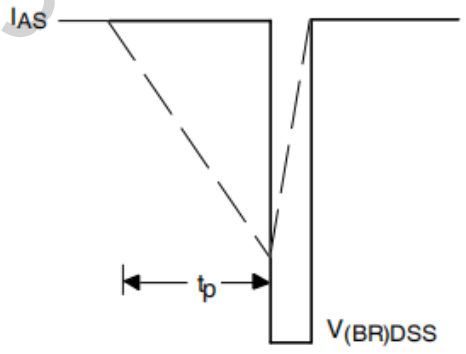
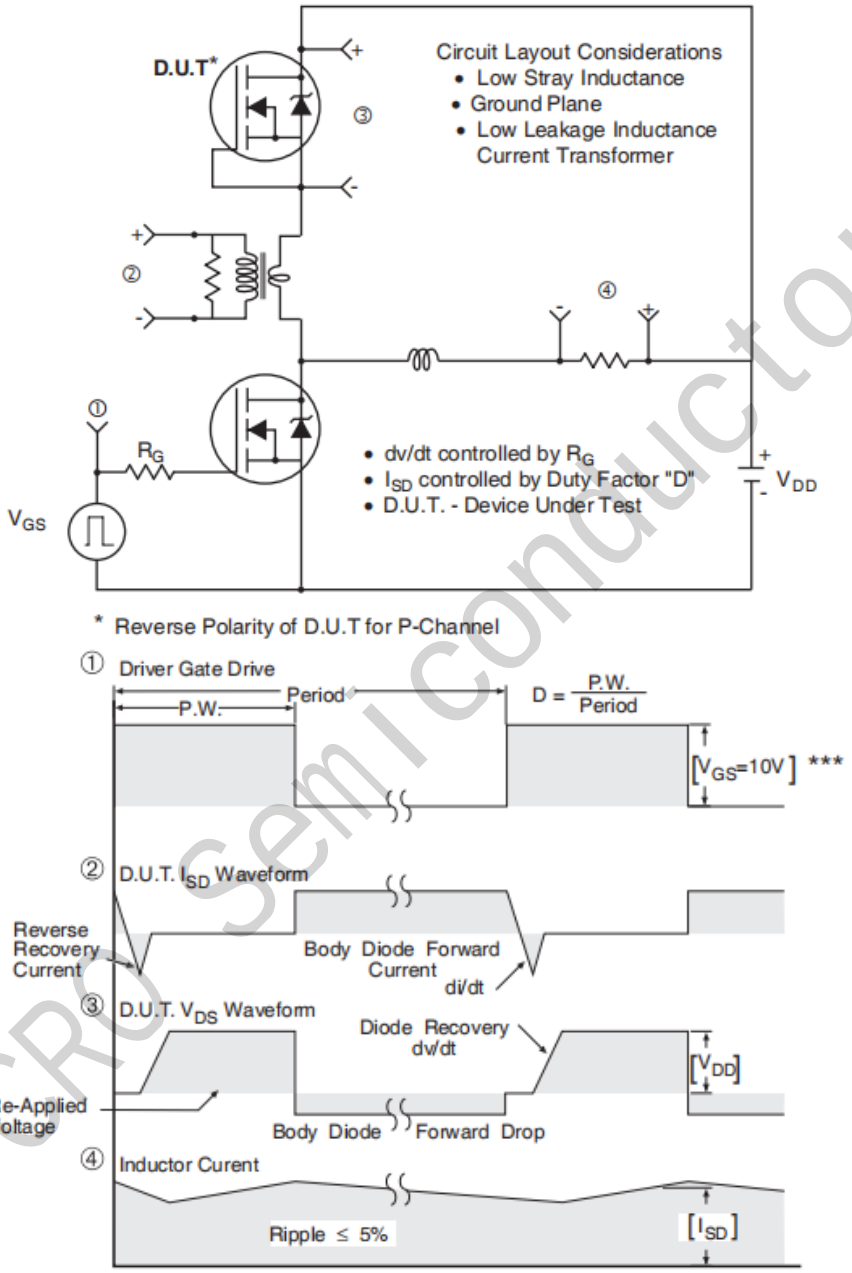


Fig 13b. Unclamped Inductive Waveforms

Typical Characteristics T_J = 25ºC, unless otherwise noted

Peak Diode Recovery dv/dt Test Circuit

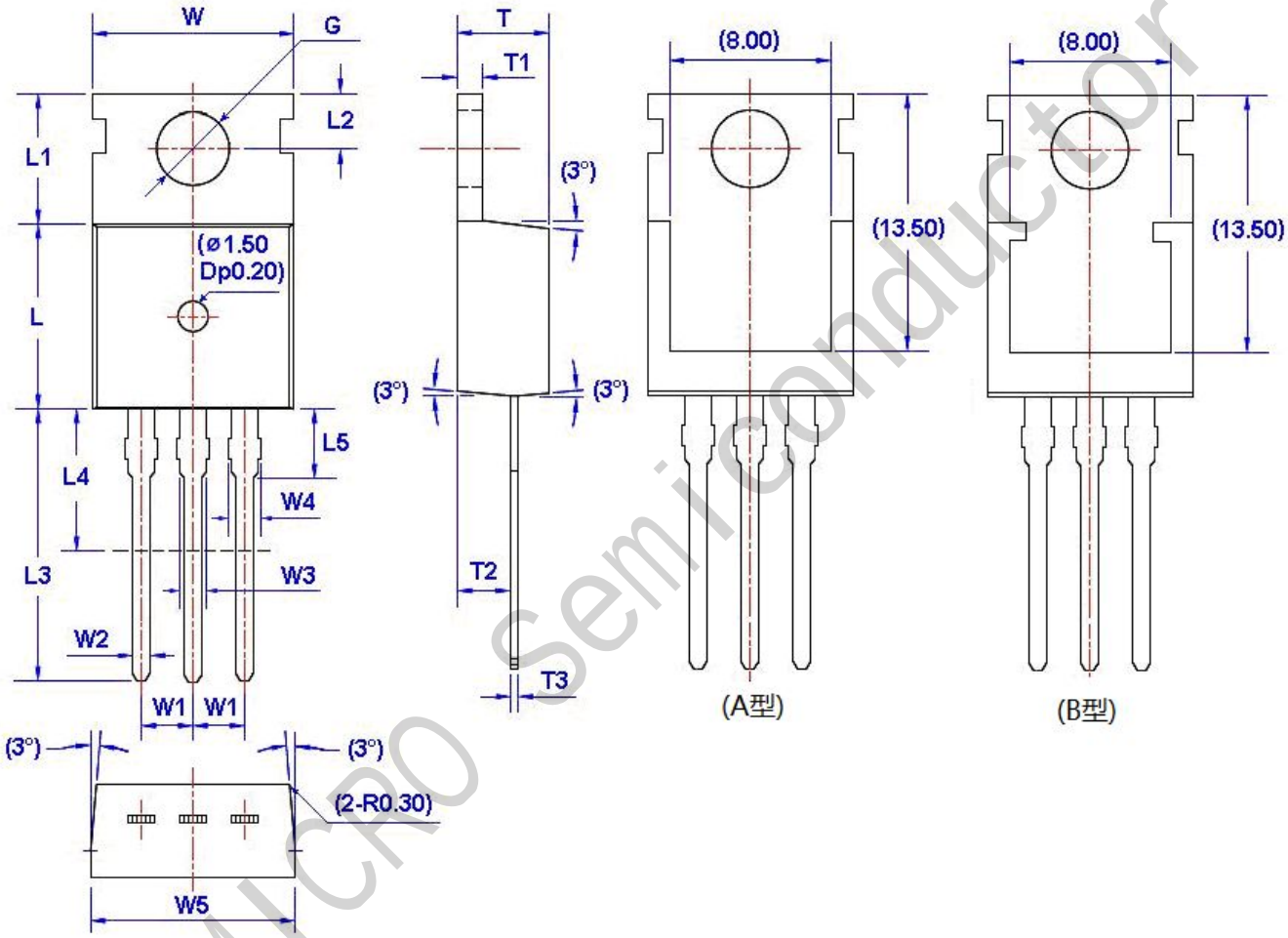


*** V_{GS} = 5.0V for Logic Level and 3V Drive Devices

Fig 14. For P-Channel HEXFETS

Package Information

TO-220



Unit: mm

Symbol	Size		Symbol	Size		Symbol	Size		Symbol	Size	
	Min	Max		Min	Max		Min	Max		Min	Max
W	9.66	10.28	W5	9.80	10.20	L4**	6.20	6.60	T3	0.45	0.60
W1	2.54（TYP）		L	9.00	9.40	L5	2.79	3.30	G(Φ)	3.50	3.70
W2	0.70	0.95	L1	6.40	6.80	T	4.30	4.70			
W3	1.17	1.37	L2	2.70	2.90	T1	1.15	1.40			
W4*	1.32	1.72	L3	12.70	14.27	T2	2.20	2.60			

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