



Description

The HXY49N05T can be used in various power

switching circuit for system miniaturization and higher efficiency. The package form is TO-263, which accords with the RoHS standard.

General Features

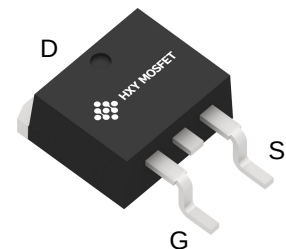
$V_{DS} = 55V$ $I_D = 49A$

$R_{DS(ON)} < 13m\Omega @ V_{GS}=10V$

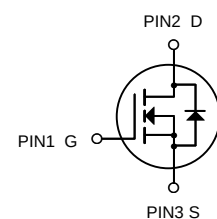
Application

Switching application

Power Management for Inverter Systems.



TO-263



N-Channel MOSFET

Package Marking and Ordering Information

Product ID	Pack	Marking	Units/Tube)
HXY49N05T	TO-263	FZ44NS XXXX	50

Absolute Maximum Ratings ($T_C=25^{\circ}C$ unless otherwise noted)

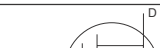
Symbol	Parameter	Limit	Unit
V_{DS}	Drain-Source Voltage	55	V
V_{GS}	Gate-Source Voltage	± 20	V
I_D	Drain Current-Continuous	49	A
$I_D (100^{\circ}C)$	Drain Current-Continuous($T_C=100^{\circ}C$)	35	A
I_{DM}	Pulsed Drain Current	160	A
P_D	Maximum Power Dissipation	94	W
E_{AR}	Repetitive Avalanche Energy	9.4	mJ
T_J, T_{STG}	Operating Junction and Storage Temperature Range	-55 To 175	$^{\circ}C$
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	1.5	$^{\circ}C/W$



Electrical Characteristics @T_J = 25°C (unless otherwise specified)

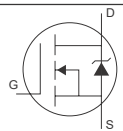
Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
V _{(BR)DSS}	Drain-to-Source Breakdown Voltage	55			V	V _{GS} = 0V, I _D = 250μA
ΔV _{(BR)DSS} /ΔT _J	Breakdown Voltage Temp. Coefficient		0.058		V/°C	Reference to 25°C, I _D = 1mA
R _{DS(on)}	Static Drain-to-Source On-Resistance		10	13	mΩ	V _{GS} = 10V, I _D = 25A
V _{GS(th)}	Gate Threshold Voltage	2.0		4.0	V	V _{DS} = V _{GS} , I _D = 250μA
g _{fs}	Forward Transconductance	19			S	V _{DS} = 25V, I _D = 25A
I _{DSS}	Drain-to-Source Leakage Current			25	μA	V _{DS} = 55V, V _{GS} = 0V
				250		V _{DS} = 44V, V _{GS} = 0V, T _J = 150°C
I _{GSS}	Gate-to-Source Forward Leakage			100	nA	V _{GS} = 20V
	Gate-to-Source Reverse Leakage			-100		V _{GS} = -20V
Q _g	Total Gate Charge			63	nC	I _D = 25A
Q _{gs}	Gate-to-Source Charge			14		V _{DS} = 44V
Q _{gd}	Gate-to-Drain ("Miller") Charge			23		V _{GS} = 10V, See Fig. 6 and 13
t _{d(on)}	Turn-On Delay Time		12		ns	V _{DD} = 28V
t _r	Rise Time		60			I _D = 25A
t _{d(off)}	Turn-Off Delay Time		44			R _G = 12Ω
t _f	Fall Time		45			V _{GS} = 10V, See Fig. 10
L _S	Internal Source Inductance		7.5		nH	Between lead, and center of die contact
C _{iss}	Input Capacitance		1470		pF	V _{GS} = 0V
C _{oss}	Output Capacitance		360			V _{DS} = 25V
C _{rss}	Reverse Transfer Capacitance		88			f = 1.0MHz, See Fig. 5
E _{AS}	Single Pulse Avalanche Energy		530	150	mJ	I _{AS} = 25A, L = 0.47mH

Source-Drain Ratings and Characteristics

Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
I _S	Continuous Source Current (Body Diode)			49	)	MOSFET symbol showing the integral reverse p-n junction diode. 
I _{SM}	Pulsed Source Current (Body Diode)			160		
V _{SD}	Diode Forward Voltage			1.3	V	T _J = 25°C, I _S = 25A, V _{GS} = 0V
t _{rr}	Reverse Recovery Time		63	95	ns	T _J = 25°C, I _F = 25A
Q _{rr}	Reverse Recovery Charge		170	260	nC	di/dt = 100A/μs
t _{on}	Forward Turn-On Time	Intrinsic turn-on time is negligible (turn-on is dominated by L _S +L _D)				

Notes:

- ① Repetitive rating; pulse width limited by max. junction temperature. (See fig. 11)
- ② Starting T_J = 25°C, L = 0.48mH
R_G = 25Ω, I_{AS} = 25A. (See Figure 12)
- ③ I_{SD} ≤ 25A, di/dt ≤ 230A/μs, V_{DD} ≤ V_{(BR)DSS}, T_J ≤ 175°C
- ④ Pulse width ≤ 400μs; duty cycle ≤ 2%.
- ⑤ This is a typical value at device destruction and represents operation outside rated limits.
- ⑥ This is a calculated value limited to T_J = 175°C .





Typical Characteristics

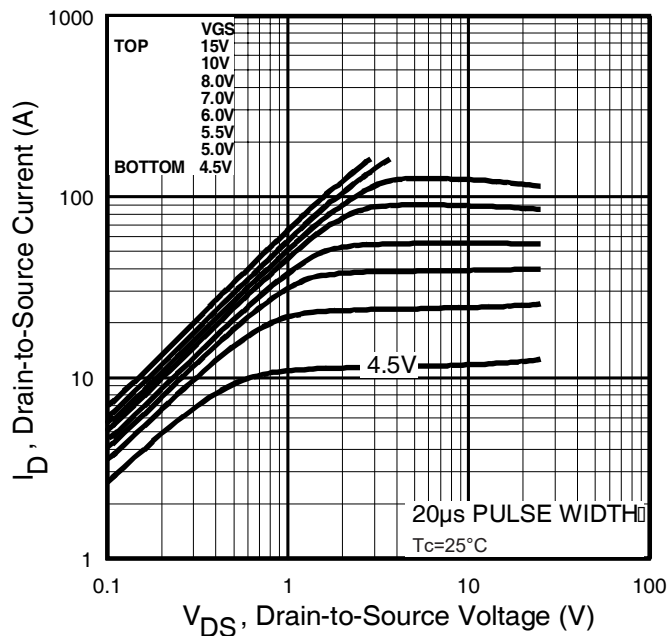


Fig 1. Typical Output Characteristics

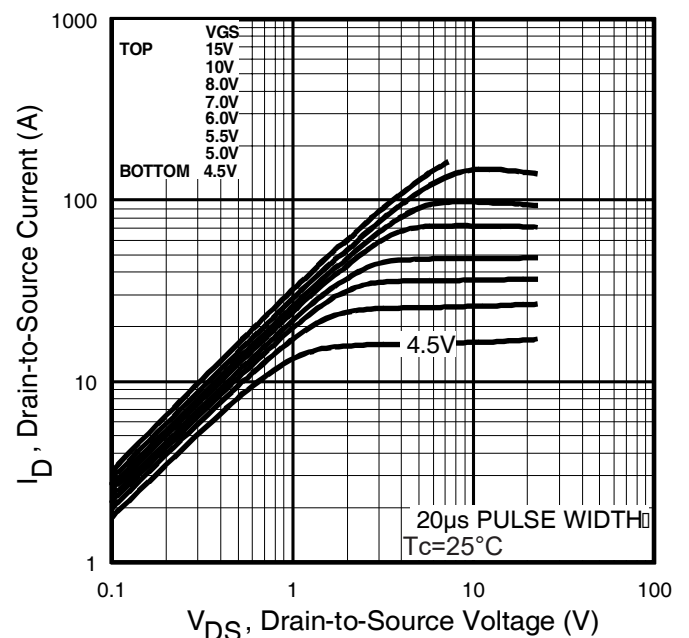


Fig 2. Typical Output Characteristics

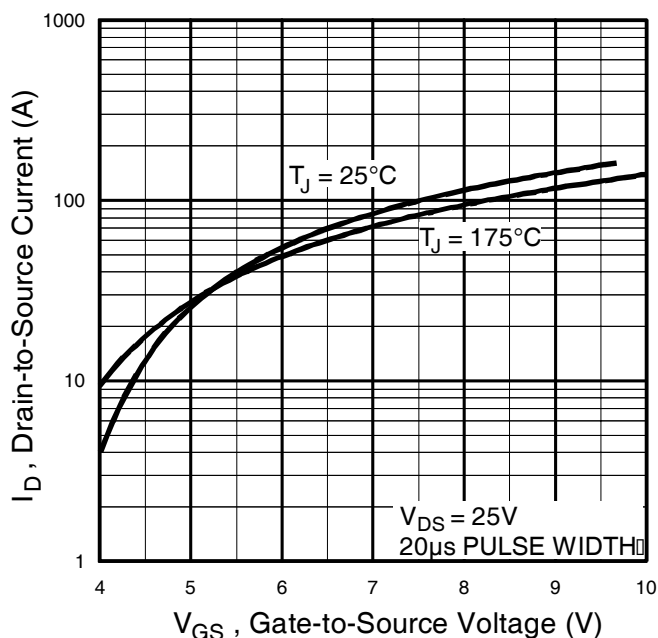


Fig 3. Typical Transfer Characteristics

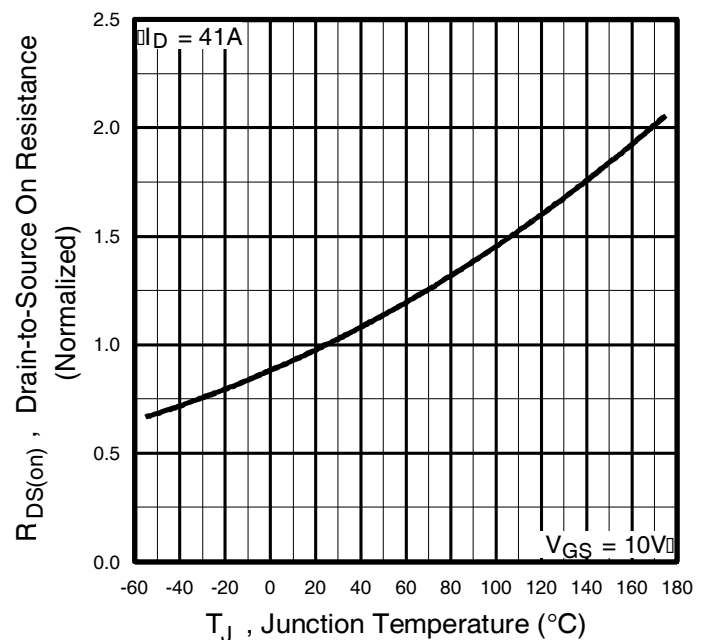


Fig 4. Normalized On-Resistance Vs. Temperature

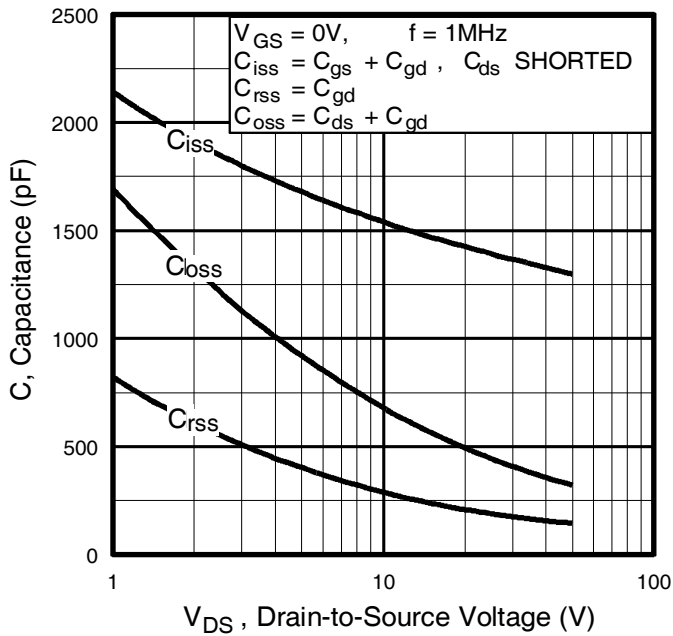


Fig 5. Typical Capacitance Vs. Drain-to-Source Voltage

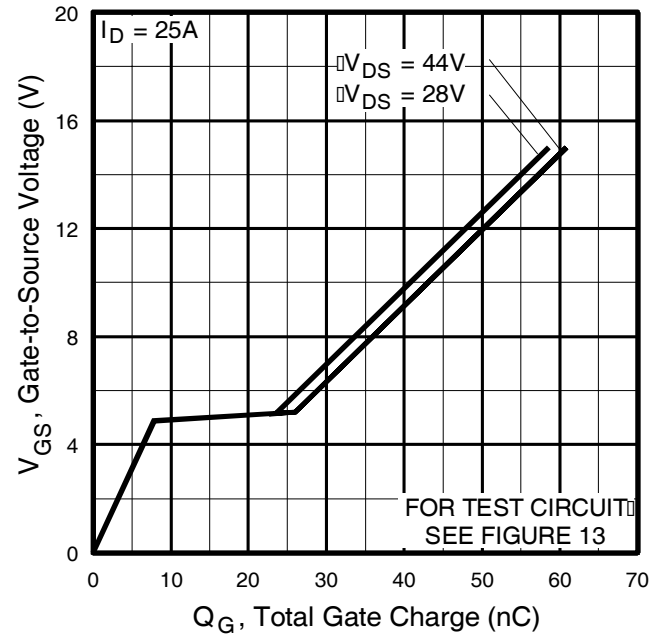


Fig 6. Typical Gate Charge Vs. Gate-to-Source Voltage

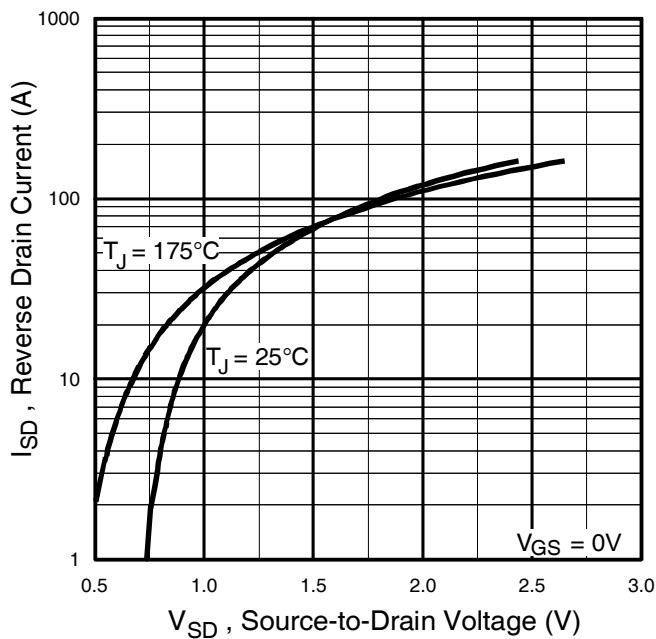


Fig 7. Typical Source-Drain Diode Forward Voltage

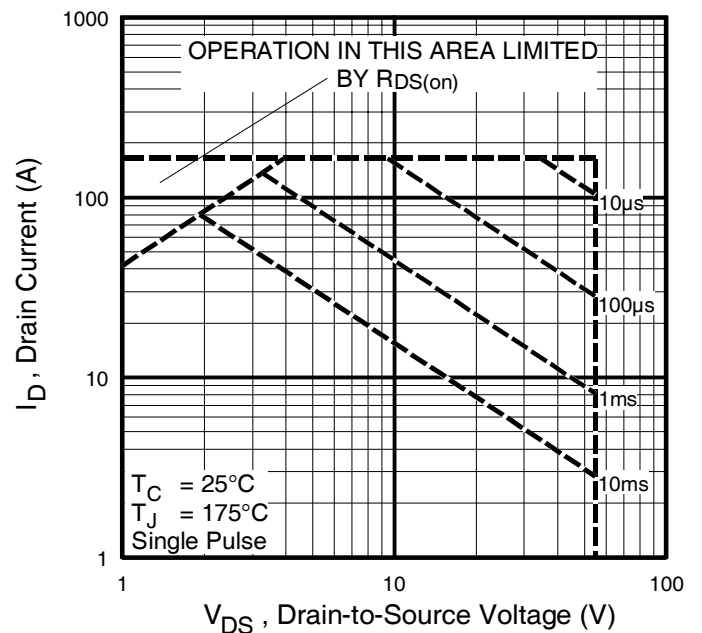


Fig 8. Maximum Safe Operating Area

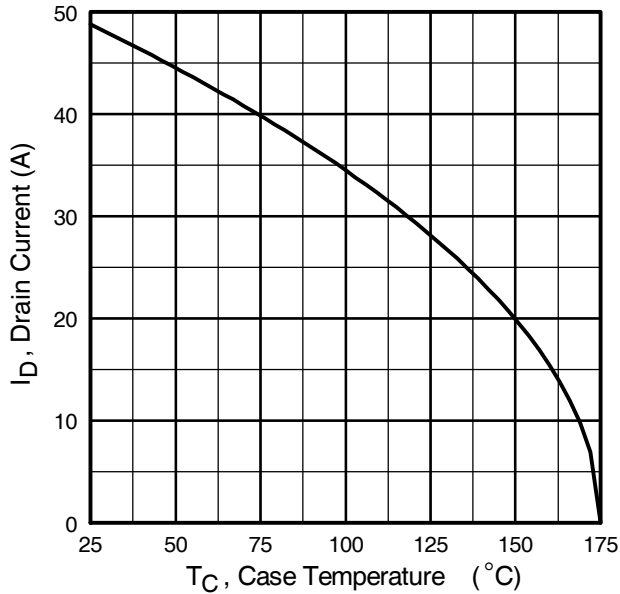


Fig 9. Maximum Drain Current Vs. Case Temperature

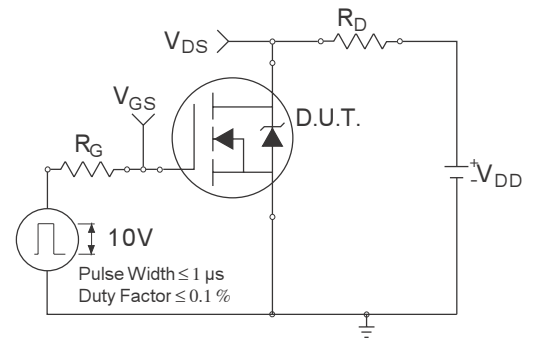


Fig 10a. Switching Time Test Circuit

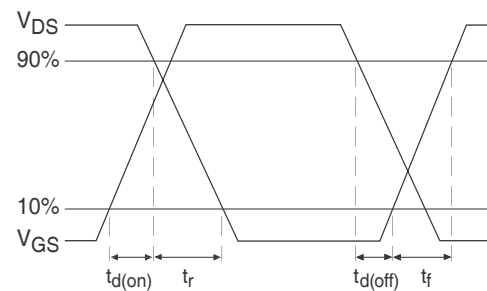


Fig 10b. Switching Time Waveforms

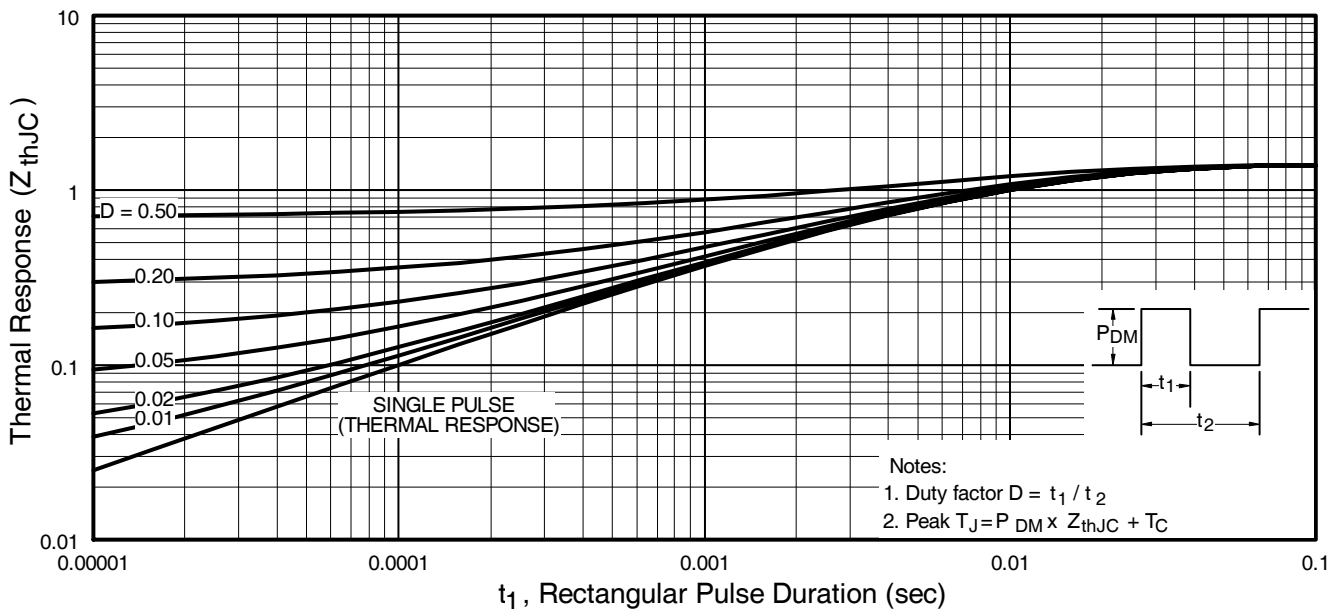


Fig 11. Maximum Effective Transient Thermal Impedance, Junction-to-Case

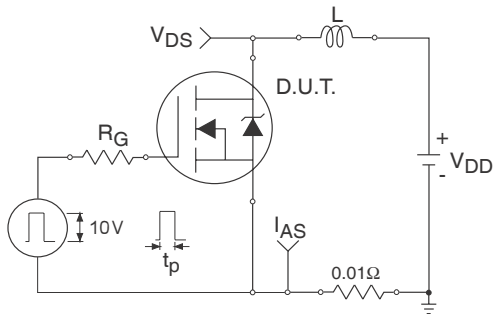


Fig 12a. Unclamped Inductive Test Circuit

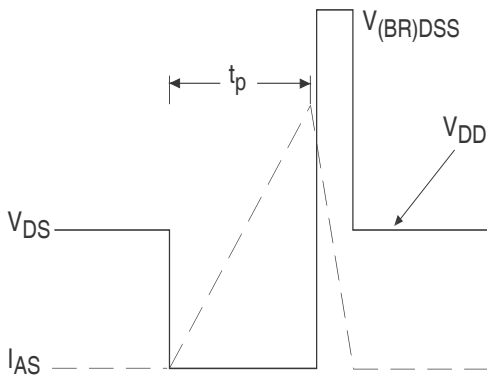


Fig 12b. Unclamped Inductive Waveforms

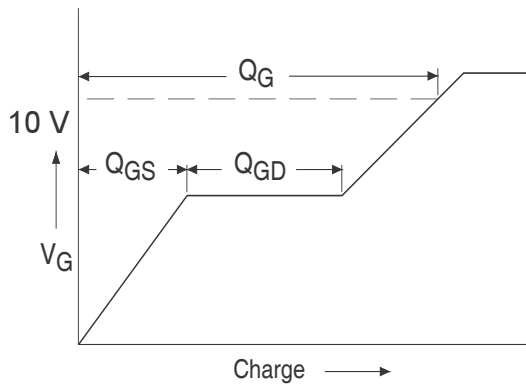


Fig 13a. Basic Gate Charge Waveform

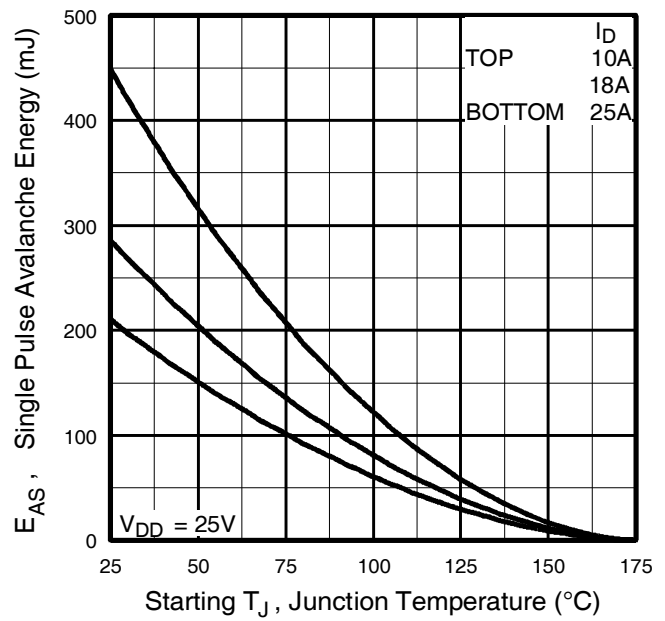


Fig 12c. Maximum Avalanche Energy
Vs. Drain Current

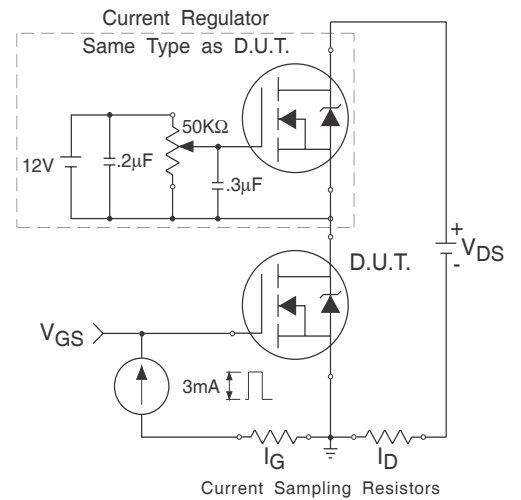


Fig 13b. Gate Charge Test Circuit

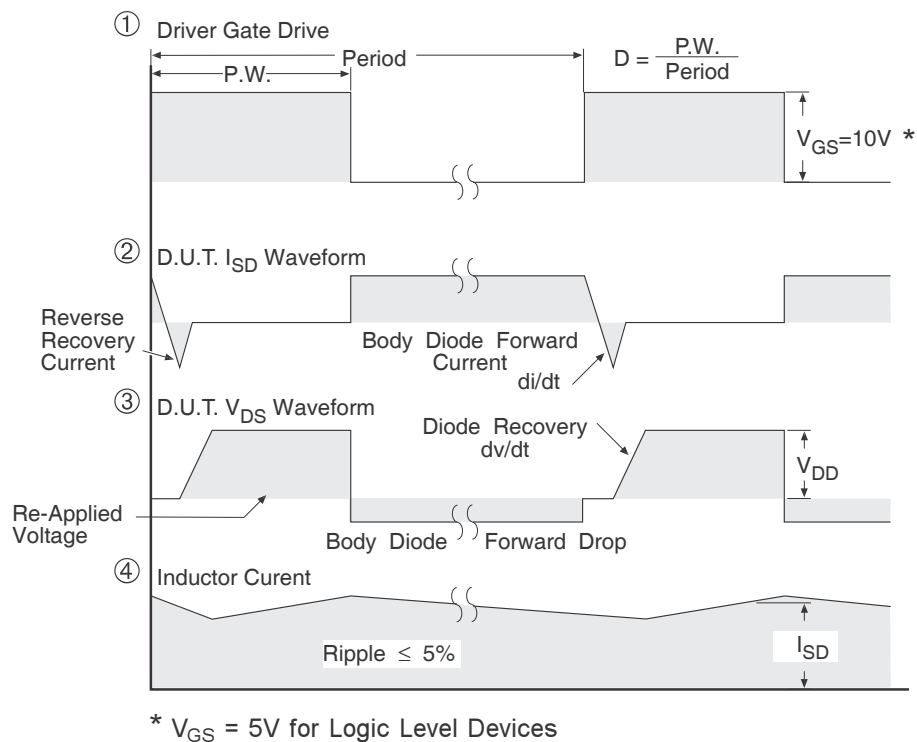
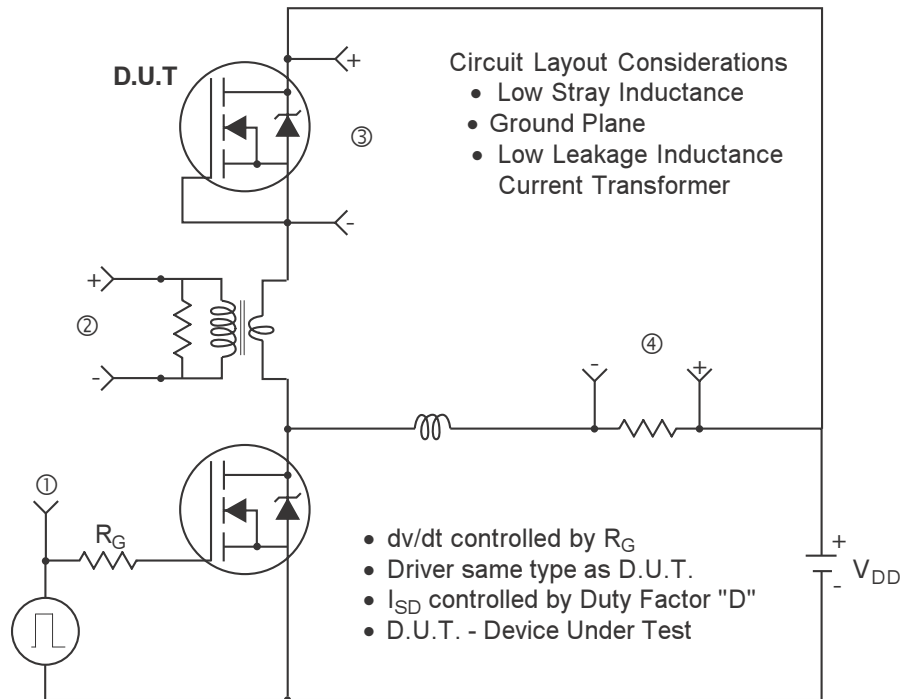
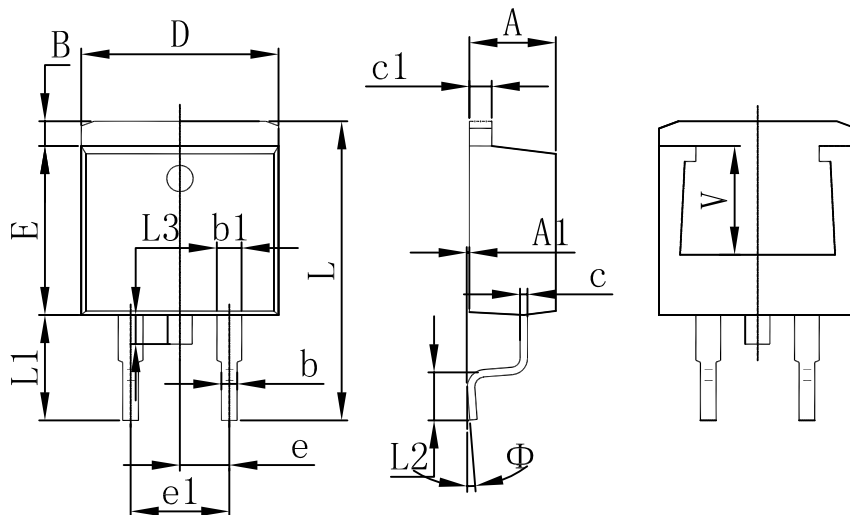


Fig 14. For N-Channel HEXFETS



TO-263(D2PAK) Package Outline Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.470	4.670	0.176	0.184
A1	0.000	0.150	0.000	0.006
B	1.120	1.420	0.044	0.056
b	0.710	0.910	0.028	0.036
b1	1.170	1.370	0.046	0.054
c	0.310	0.530	0.012	0.021
c1	1.170	1.370	0.046	0.054
D	10.010	10.310	0.394	0.406
E	8.500	8.900	0.335	0.350
e	2.540 TYP.		0.100 TYP.	
e1	4.980	5.180	0.196	0.204
L	14.940	15.500	0.588	0.610
L1	4.950	5.450	0.195	0.215
L2	2.340	2.740	0.092	0.108
L3	1.300	1.700	0.051	0.067
Φ	0°	8°	0°	8°
V	5.600 REF.		0.220REF.	



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