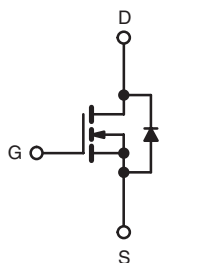
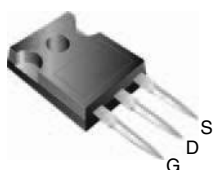


Power MOSFET

PRODUCT SUMMARY

V_{DS} (V)	250	
$R_{DS(on)}$ (Ω)	$V_{GS} = 10\text{ V}$	0.060
Q_g (Max.) (nC)	210	
Q_{gs} (nC)	34	
Q_{gd} (nC)	94	
Configuration	Single	

TO-247



N-Channel MOSFET

FEATURES

- Advanced Process Technology
- Dynamic dV/dt Rating
- 175 °C Operating Temperature
- Fast Switching
- Fully Avalanche Rated
- Ease of Paralleling
- Simple Drive Requirements
- Lead (Pb)-free Available



RoHS*
COMPLIANT

DESCRIPTION

Fifth generation Power MOSFETs from Vishay utilize advanced processing techniques to achieve extremely low on-resistance per silicon area. This benefit, combined with the fast switching speed and ruggedized device design that Power MOSFETs are well known for, provides the designer with an extremely efficient and reliable device for use in a wide variety of applications.

The TO-247 package is preferred for commercial-industrial applications where higher power levels preclude the use of TO-220 devices. The TO-247 is similar but superior to the earlier TO-218 package because of its isolated mounting hole.

ORDERING INFORMATION

Package	TO-247
Lead (Pb)-free	IRFP264NPbF SiHFP264N-E3
SnPb	IRFP264N SiHFP264N

ABSOLUTE MAXIMUM RATINGS $T_C = 25\text{ °C}$, unless otherwise noted

PARAMETER	SYMBOL	LIMIT	UNIT
Drain-Source Voltage	V_{DS}	250	V
Gate-Source Voltage	V_{GS}	± 20	
Continuous Drain Current	V_{GS} at 10 V	$T_C = 25\text{ °C}$	A
		$T_C = 100\text{ °C}$	
Pulsed Drain Current ^a	I_{DM}	170	
Linear Derating Factor		2.6	W/°C
Single Pulse Avalanche Energy ^b	E_{AS}	520	mJ
Repetitive Avalanche Current ^a	I_{AR}	25	A
Repetitive Avalanche Energy ^a	E_{AR}	38	mJ
Maximum Power Dissipation	P_D	380	W
Peak Diode Recovery dV/dt ^c	dV/dt	8.7	V/ns
Operating Junction and Storage Temperature Range	T_J, T_{stg}	- 55 to + 175	°C
Soldering Recommendations (Peak Temperature)	for 10 s	300 ^d	
Mounting Torque	6-32 or M3 screw	10	
		1.1	N · m

Notes

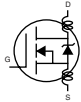
- Repetitive rating; pulse width limited by maximum junction temperature (see fig. 11).
- Starting $T_J = 25\text{ °C}$, $L = 1.7\text{ mH}$, $R_G = 25\text{ }\Omega$, $I_{AS} = 25\text{ A}$, $V_{GS} = 10\text{ V}$ (see fig. 12).
- $I_{SD} \leq 25\text{ A}$, $dI/dt \leq 500\text{ A}/\mu\text{s}$, $V_{DD} \leq V_{DS}$, $T_J \leq 175\text{ °C}$.
- 1.6 mm from case.

* Pb containing terminations are not RoHS compliant, exemptions may apply

THERMAL RESISTANCE RATINGS

PARAMETER	SYMBOL	TYP.	MAX.	UNIT
Maximum Junction-to-Ambient	R_{thJA}	-	40	°C/W
Case-to-Sink, Flat, Greased Surface	R_{thCS}	0.24	-	
Maximum Junction-to-Case (Drain)	R_{thJC}	-	0.39	

SPECIFICATIONS $T_J = 25\text{ °C}$, unless otherwise noted

PARAMETER	SYMBOL	TEST CONDITIONS		MIN.	TYP.	MAX.	UNIT
Static							
Drain-Source Breakdown Voltage	V _{DS}	V _{GS} = 0 V, I _D = 250 μA		250	-	-	V
V _{DS} Temperature Coefficient	ΔV _{DS} /T _J	Reference to 25 °C, I _D = 1 mA		-	0.30	-	V/°C
Gate-Source Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250 μA		2.0	-	4.0	V
Gate-Source Leakage	I _{GSS}	V _{GS} = ± 20 V		-	-	± 100	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 250 V, V _{GS} = 0 V		-	-	25	μA
		V _{DS} = 200 V, V _{GS} = 0 V, T _J = 150 °C		-	-	250	
Drain-Source On-State Resistance	R _{DS(on)}	V _{GS} = 10 V	I _D = 25 A ^b	-	-	0.060	Ω
Forward Transconductance	g _{fs}	V _{DS} = 25 V, I _D = 25 A ^b		29	-	-	S
Dynamic							
Input Capacitance	C _{iss}	V _{GS} = 0 V, V _{DS} = 25 V, f = 1.0 MHz, see fig. 5		-	3860	-	pF
Output Capacitance	C _{oss}			-	480	-	
Reverse Transfer Capacitance	C _{rss}			-	110	-	
Total Gate Charge	Q _g	V _{GS} = 10 V	I _D = 25 A, V _{DS} = 200 V, see fig. 6 and 13	-	-	210	nC
Gate-Source Charge	Q _{gs}			-	-	34	
Gate-Drain Charge	Q _{gd}			-	-	94	
Turn-On Delay Time	t _{d(on)}	V _{DD} = 30 V, I _D = 25 A , R _G = 1.8 Ω, V _{GS} = 10 V, see fig. 10 ^b		-	17	-	ns
Rise Time	t _r			-	62	-	
Turn-Off Delay Time	t _{d(off)}			-	52	-	
Fall Time	t _f			-	53	-	
Internal Drain Inductance	L _D	Between lead, 6 mm (0.25") from package and center of die contact 		-	5.0	-	nH
Internal Source Inductance	L _S			-	13	-	
Drain-Source Body Diode Characteristics							
Continuous Source-Drain Diode Current	I _S	MOSFET symbol showing the integral reverse p - n junction diode 		-	-	44	A
Pulsed Diode Forward Current ^a	I _{SM}			-	-	170	
Body Diode Voltage	V _{SD}	T _J = 25 °C, I _S = 25 A, V _{GS} = 0 V ^b		-	-	1.3	V
Body Diode Reverse Recovery Time	t _{rr}	T _J = 25 °C, I _F = 25 A, dI/dt = 100 A/μs ^b		-	270	400	ns
Body Diode Reverse Recovery Charge	Q _{rr}			-	2.7	4.1	μC
Forward Turn-On Time	t _{on}	Intrinsic turn-on time is negligible (turn-on is dominated by L _S and L _D)					

Notes

- a. Repetitive rating; pulse width limited by maximum junction temperature (see fig. 11).
b. Pulse width $\leq 300\text{ }\mu\text{s}$; duty cycle $\leq 2\%$.

TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted

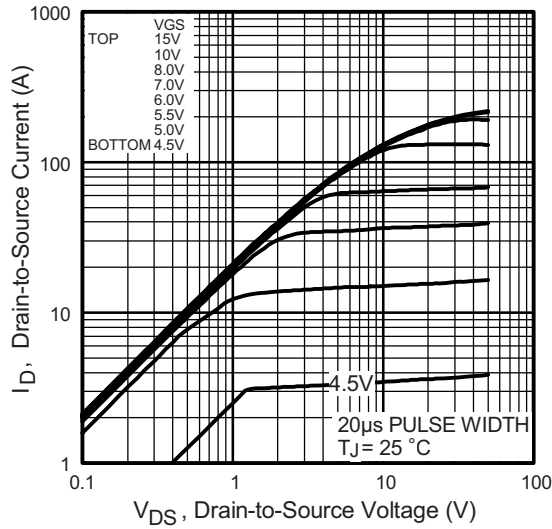


Fig. 1 - Typical Output Characteristics

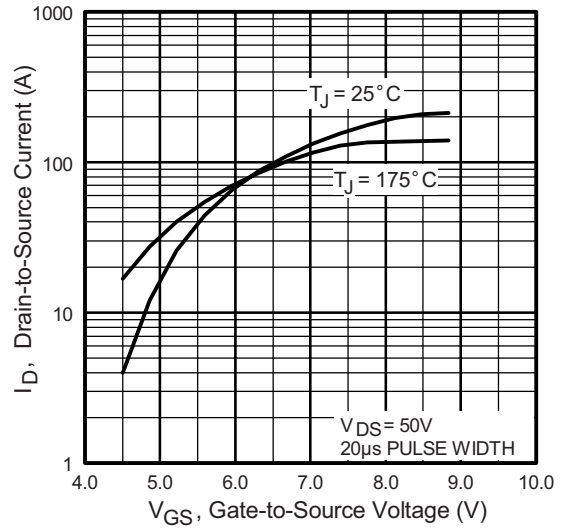


Fig. 3 - Typical Transfer Characteristics

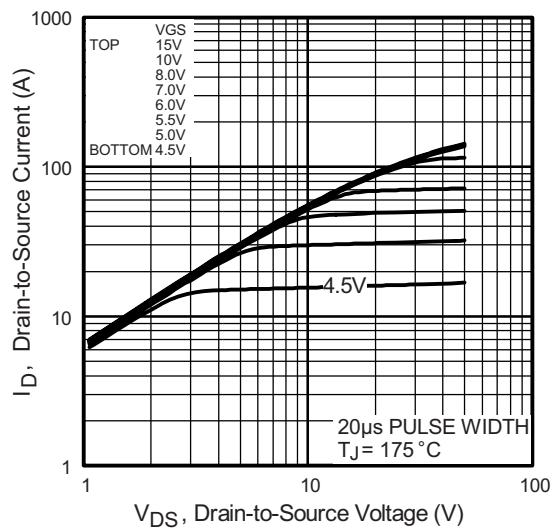


Fig. 2 - Typical Output Characteristics

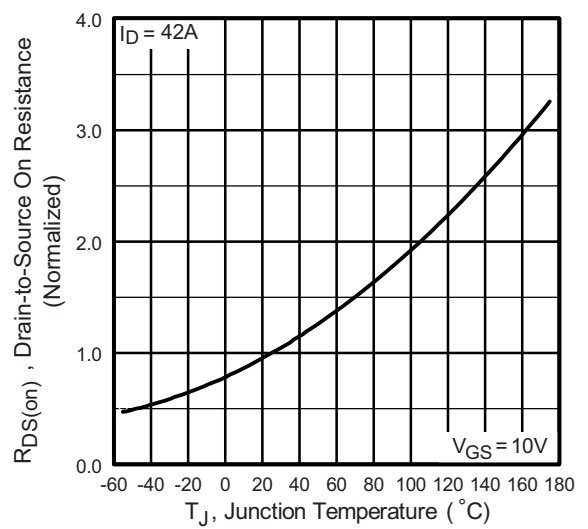
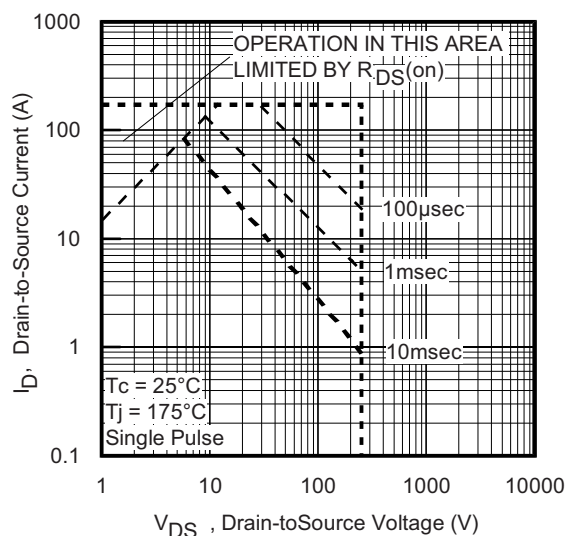
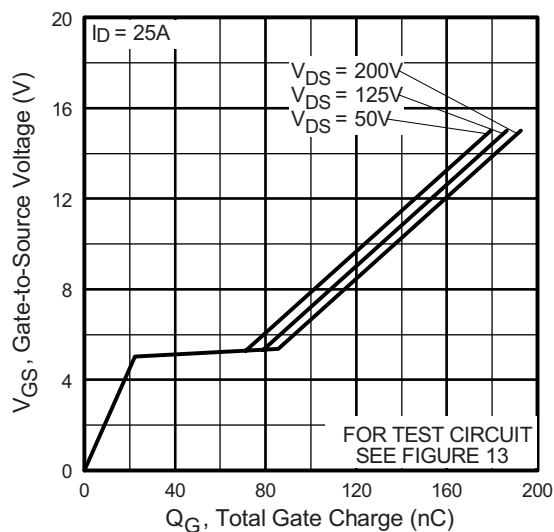
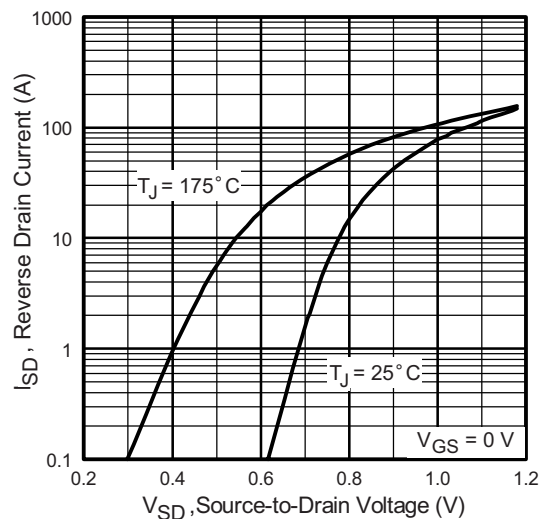
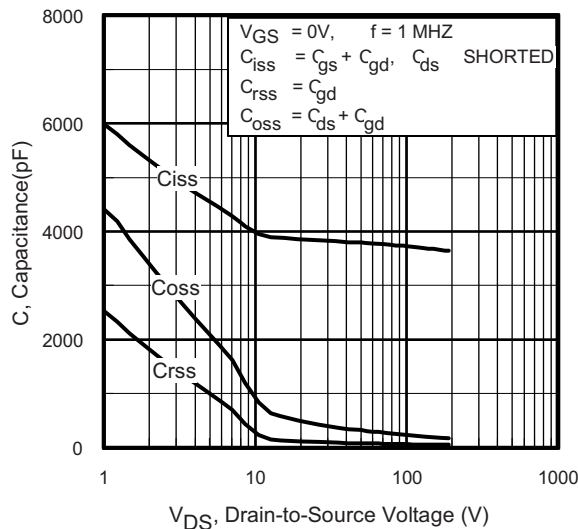


Fig. 4 - Normalized On-Resistance vs. Temperature



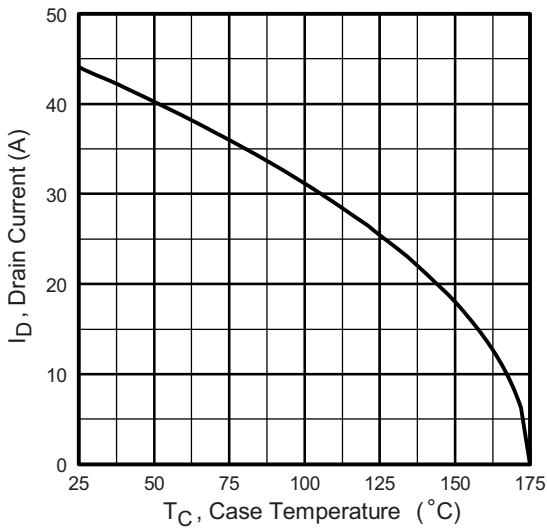


Fig. 9 - Maximum Drain Current vs. Case Temperature

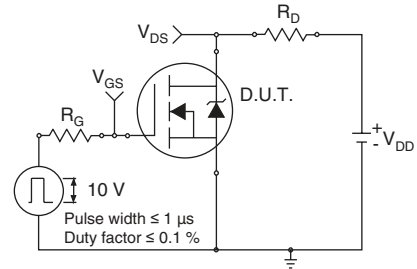


Fig. 10a - Switching Time Test Circuit

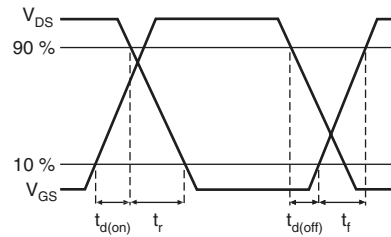


Fig. 10b - Switching Time Waveforms

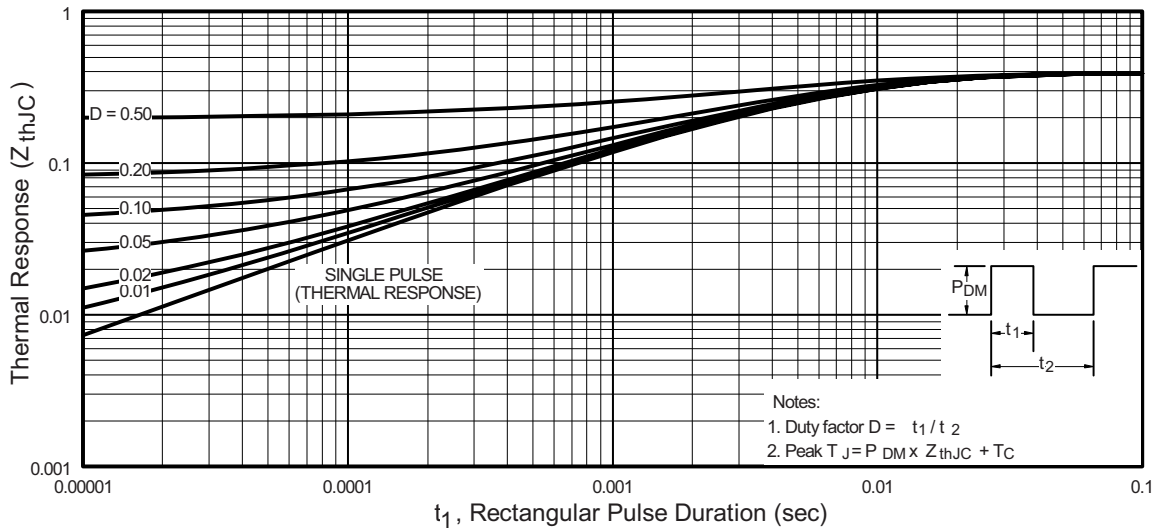


Fig. 11 - Maximum Effective Transient Thermal Impedance, Junction-to-Case

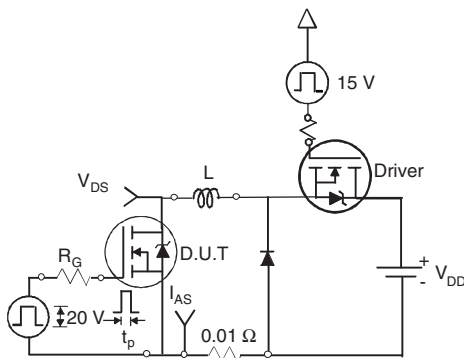


Fig. 12a - Unclamped Inductive Test Circuit

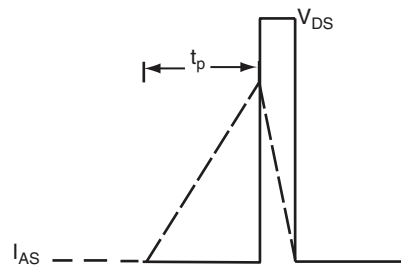


Fig. 12b - Unclamped Inductive Waveforms

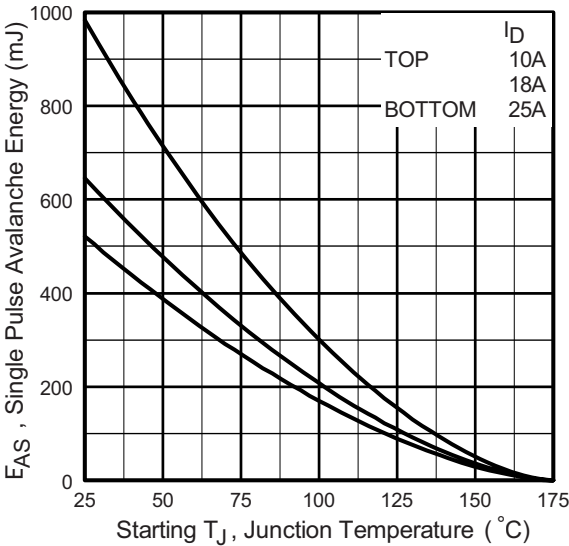


Fig. 12c - Maximum Avalanche Energy vs. Drain Current

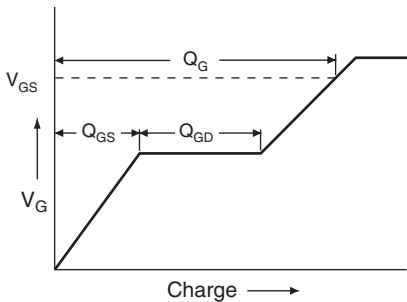


Fig. 13a - Basic Gate Charge Waveform

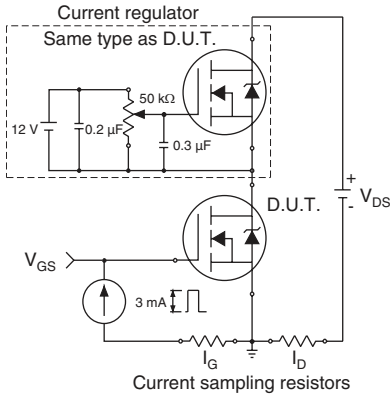


Fig. 13b - Gate Charge Test Circuit

Peak Diode Recovery dV/dt Test Circuit

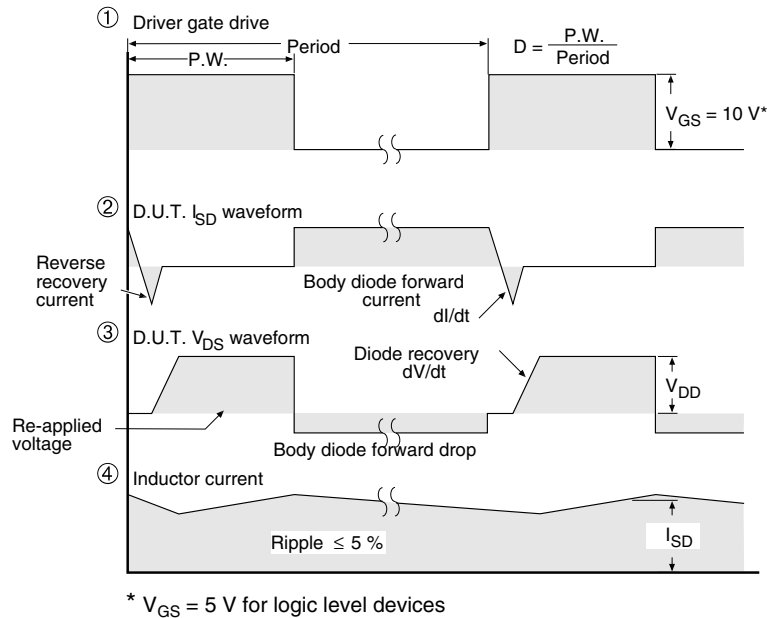
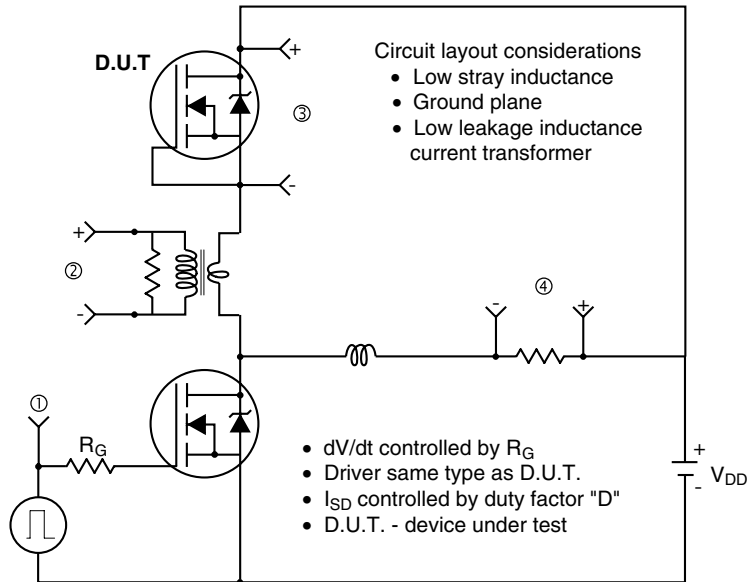


Fig. 14 - For N-Channel

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