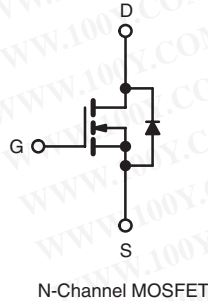
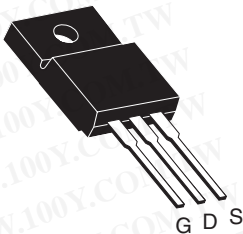


勝特力材料 886-3-5753170
 勝特力电子(上海) 86-21-34970699
 勝特力电子(深圳) 86-755-83298787
 Http://www.100y.com.tw

Power MOSFET

PRODUCT SUMMARY		
V _{DS} (V)	100	
R _{DS(on)} (Ω)	V _{GS} = 5.0 V	0.16
Q _g (Max.) (nC)	28	
Q _{gs} (nC)	3.8	
Q _{gd} (nC)	14	
Configuration	Single	

TO-220 FULLPAK



FEATURES

- Isolated Package
- High Voltage Isolation = 2.5 kV_{RMS} (t = 60 s; f = 60 Hz)
- Sink to Lead Creepage Dist. = 4.8 mm
- Logic-Level Gate Drive
- R_{DS(on)} Specified at V_{GS} = 4 V and 5 V
- Fast Switching
- Ease of paralleling
- Lead (Pb)-free Available



Available
RoHS*
 COMPLIANT

DESCRIPTION

Third generation Power MOSFETs from Vishay provide the designer with the best combination of fast switching, ruggedized device design, low on-resistance and cost-effectiveness. The TO-220 FULLPAK eliminates the need for additional insulating hardware in commercial-industrial applications. The molding compound used provides a high isolation capability and a low thermal resistance between the tab and external heatsink. This isolation is equivalent to using a 100 micron mica barrier with standard TO-220 product. The FULLPAK is mounted to a heatsink using a single clip or by a single screw fixing.

ORDERING INFORMATION	
Package	FULLPAK220
Lead (Pb)-free	IRLI530GPbF SiHLI530G-E3
SnPb	IRLI530G SiHLI530G

ABSOLUTE MAXIMUM RATINGS T _C = 25 °C, unless otherwise noted					
PARAMETER		SYMBOL	LIMIT	UNIT	
Drain-Source Voltage		V _{DS}	100	V	
Gate-Source Voltage		V _{GS}	± 10		
Continuous Drain Current	V _{GS} at 5.0 V	I _D	T _C = 25 °C	9.7	A
			T _C = 100 °C	6.9	
Pulsed Drain Current ^a		I _{DM}	39		
Linear Derating Factor			0.28	W/°C	
Single Pulse Avalanche Energy ^b		E _{AS}	250	mJ	
Repetitive Avalanche Current ^a		I _{AR}	9.7	A	
Repetitive Avalanche Energy ^a		E _{AR}	4.2	mJ	
Maximum Power Dissipation	T _C = 25 °C	P _D	42	W	
Peak Diode Recovery dV/dt ^c		dV/dt	5.5	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		lbf · in
			1.1	N · m	

Notes

- Repetitive rating; pulse width limited by maximum junction temperature (see fig. 11).
- V_{DD} = 25 V, starting T_J = 25 °C, L = 4.0 mH, R_G = 25 Ω, I_{AS} = 9.7 A (see fig. 12c).
- I_{SD} ≤ 15 A, dI/dt ≤ 140 A/μs, V_{DD} ≤ V_{DS}, T_J ≤ 175 °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}	-	65	°C/W
Maximum Junction-to-Case (Drain)	R_{thJC}	-	3.6	

SPECIFICATIONS $T_J = 25\text{ }^\circ\text{C}$, unless otherwise noted							
PARAMETER	SYMBOL	TEST CONDITIONS		MIN.	TYP.	MAX.	UNIT
Static							
Drain-Source Breakdown Voltage	V_{DS}	$V_{GS} = 0\text{ V}, I_D = 250\text{ }\mu\text{A}$		100	-	-	V
V_{DS} Temperature Coefficient	$\Delta V_{DS}/T_J$	Reference to $25\text{ }^\circ\text{C}$, $I_D = 1\text{ mA}$		-	0.14	-	V/°C
Gate-Source Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\text{ }\mu\text{A}$		1.0	-	2.0	V
Gate-Source Leakage	I_{GSS}	$V_{GS} = \pm 10\text{ V}$		-	-	± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 100\text{ V}, V_{GS} = 0\text{ V}$		-	-	25	μA
		$V_{DS} = 80\text{ V}, V_{GS} = 0\text{ V}, T_J = 150\text{ }^\circ\text{C}$		-	-	250	
Drain-Source On-State Resistance	$R_{DS(on)}$	$V_{GS} = 5.0\text{ V}$	$I_D = 5.8\text{ A}^b$	-	-	0.16	Ω
		$V_{GS} = 4.0\text{ V}$	$I_D = 4.9\text{ A}^b$	-	-	0.22	
Forward Transconductance	g_{fs}	$V_{DS} = 25\text{ V}, I_D = 5.8\text{ A}^b$		6.1	-	-	S
Dynamic							
Input Capacitance	C_{iss}	$V_{GS} = 0\text{ V},$ $V_{DS} = 25\text{ V},$ $f = 1.0\text{ MHz}$, see fig. 5		-	930	-	pF
Output Capacitance	C_{oss}			-	250	-	
Reverse Transfer Capacitance	C_{rss}			-	57	-	
Drain to Sink Capacitance	C	$f = 1\text{ MHz}$		-	12	-	
Total Gate Charge	Q_g	$V_{GS} = 5.0\text{ V}$	$I_D = 15\text{ A}, V_{DS} = 80\text{ V},$ see fig. 6 and 13 ^b	-	-	28	nC
Gate-Source Charge	Q_{gs}			-	-	3.8	
Gate-Drain Charge	Q_{gd}			-	-	14	
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = 50\text{ V}, I_D = 15\text{ A},$ $R_G = 6.0\text{ }\Omega, R_D = 32\text{ }\Omega,$ see fig. 10 ^b		-	4.7	-	ns
Rise Time	t_r			-	100	-	
Turn-Off Delay Time	$t_{d(off)}$			-	22	-	
Fall Time	t_f			-	48	-	
Internal Drain Inductance	L_D	Between lead, 6 mm (0.25") from package and center of die contact		-	4.5	-	nH
Internal Source Inductance	L_S			-	7.5	-	
Drain-Source Body Diode Characteristics							
Continuous Source-Drain Diode Current	I_S	MOSFET symbol showing the integral reverse p - n junction diode		-	-	9.7	A
Pulsed Diode Forward Current ^a	I_{SM}			-	-	39	
Body Diode Voltage	V_{SD}	$T_J = 25\text{ }^\circ\text{C}, I_S = 9.7\text{ A}, V_{GS} = 0\text{ V}^b$		-	-	2.5	V
Body Diode Reverse Recovery Time	t_{rr}	$T_J = 25\text{ }^\circ\text{C}, I_F = 15\text{ A}, dI/dt = 100\text{ A}/\mu\text{s}^b$		-	100	200	ns
Body Diode Reverse Recovery Charge	Q_{rr}			-	0.70	1.4	μC
Forward Turn-On Time	t_{on}	Intrinsic turn-on time is negligible (turn-on is dominated by L_S and L_D)					

Notes

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

TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted

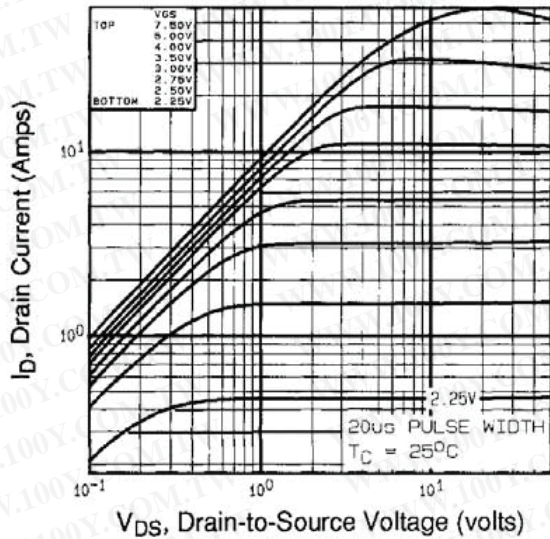


Fig. 1 - Typical Output Characteristics, $T_C = 25\text{ }^\circ\text{C}$

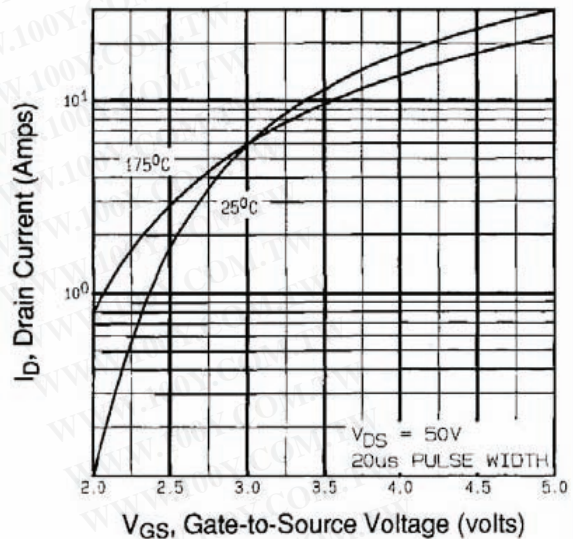


Fig. 3 - Typical Transfer Characteristics

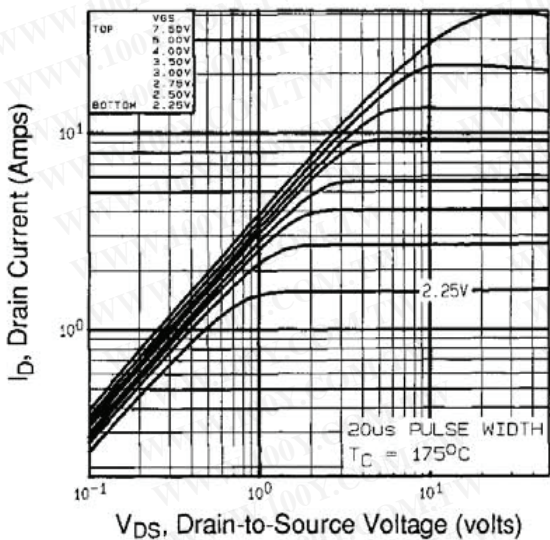


Fig. 2 - Typical Output Characteristics, $T_C = 175\text{ }^\circ\text{C}$

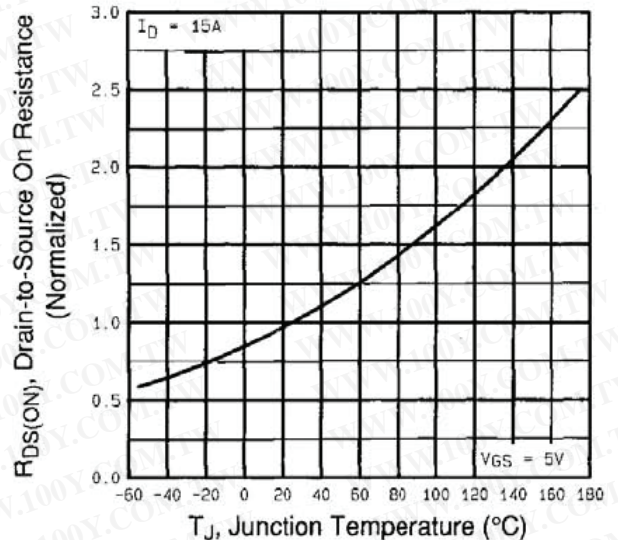


Fig. 4 - Normalized On-Resistance vs. Temperature

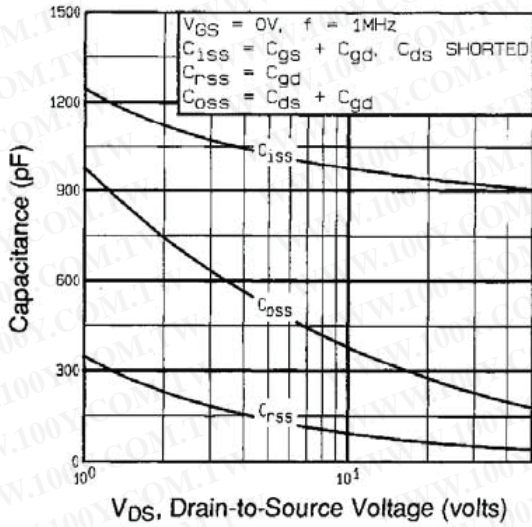


Fig. 5 - Typical Capacitance vs. Drain-to-Source Voltage

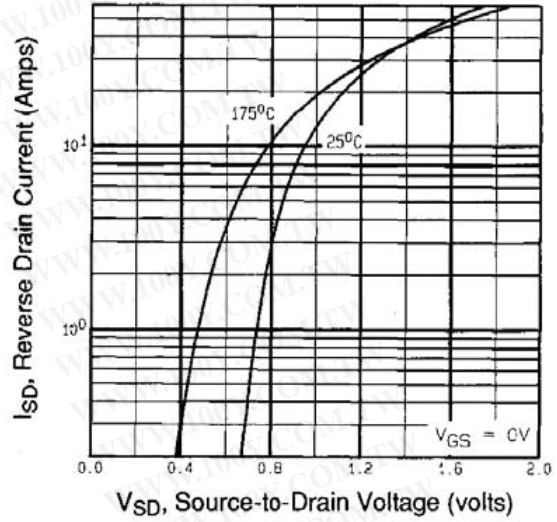


Fig. 7 - Typical Source-Drain Diode Forward Voltage

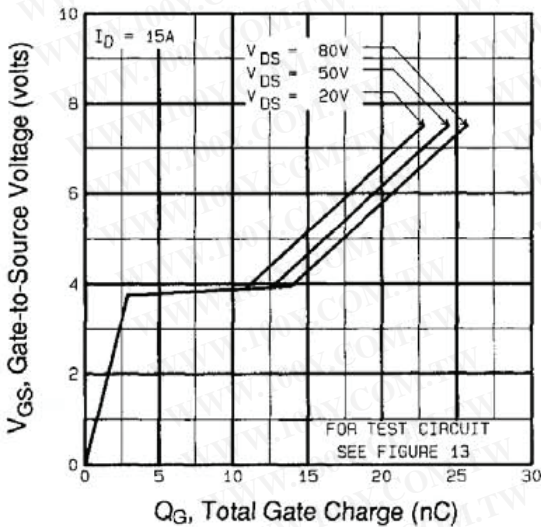


Fig. 6 - Typical Gate Charge vs. Gate-to-Source Voltage

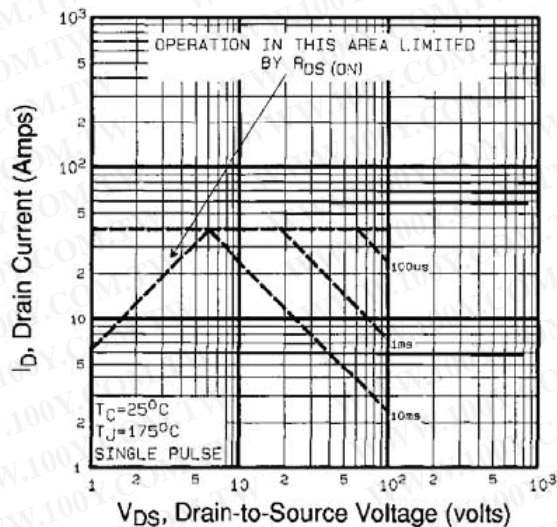


Fig. 8 - Maximum Safe Operating Area

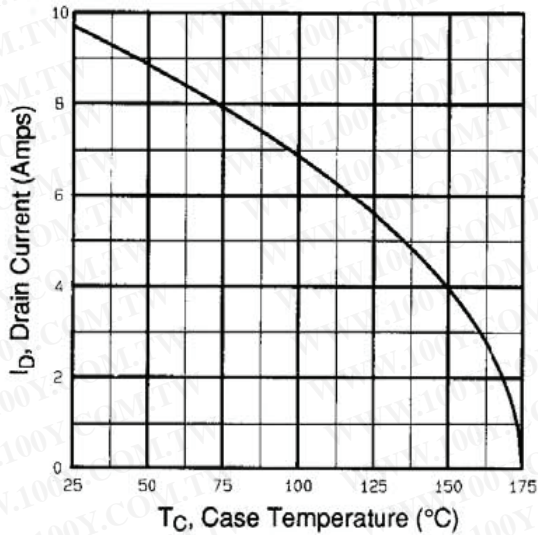


Fig. 9 - Maximum Drain Current vs. Case Temperature

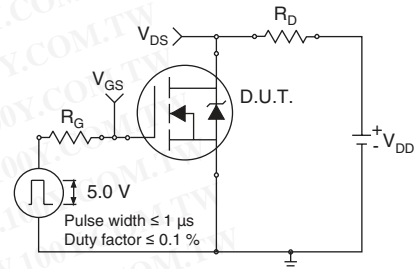


Fig. 10a - Switching Time Test Circuit

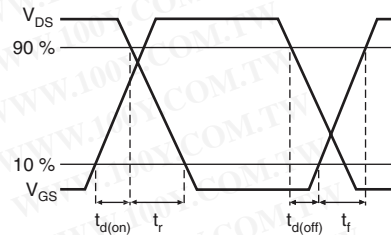


Fig. 10b - Switching Time Waveforms

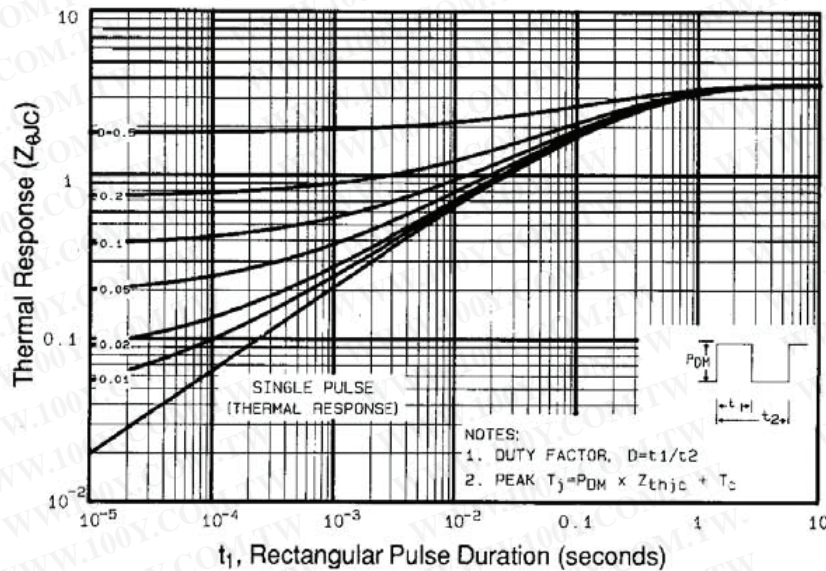


Fig. 11 - Maximum Effective Transient Thermal Impedance, Junction-to-Case

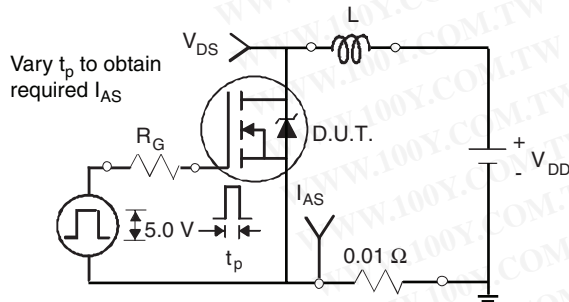


Fig. 12a - Unclamped Inductive Test Circuit

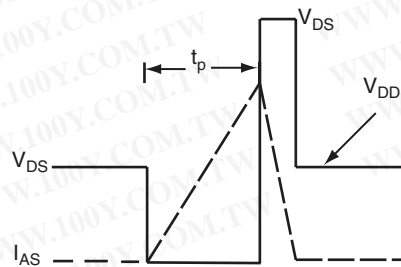


Fig. 12b - Unclamped Inductive Waveforms

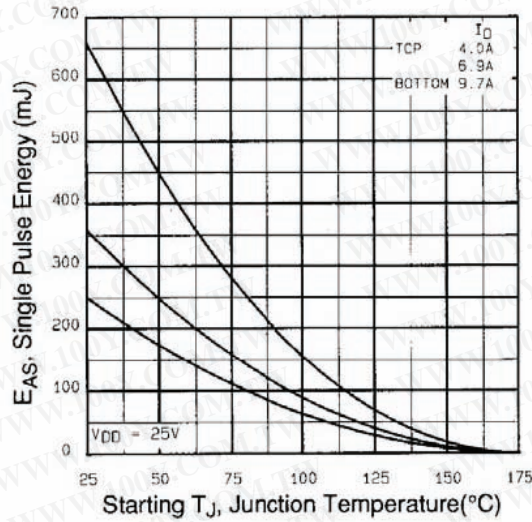


Fig. 12c - Maximum Avalanche Energy vs. Drain Current

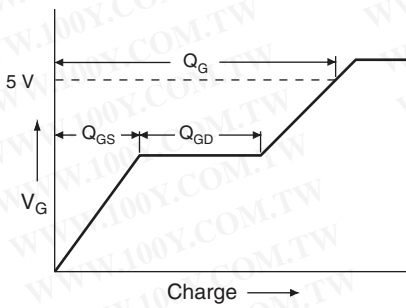


Fig. 13a - Basic Gate Charge Waveform

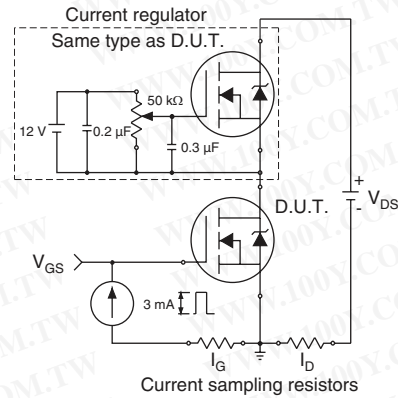
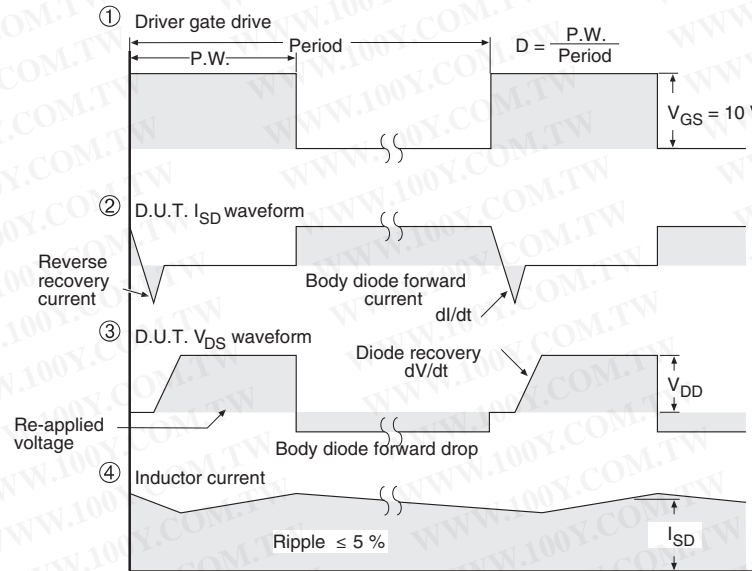
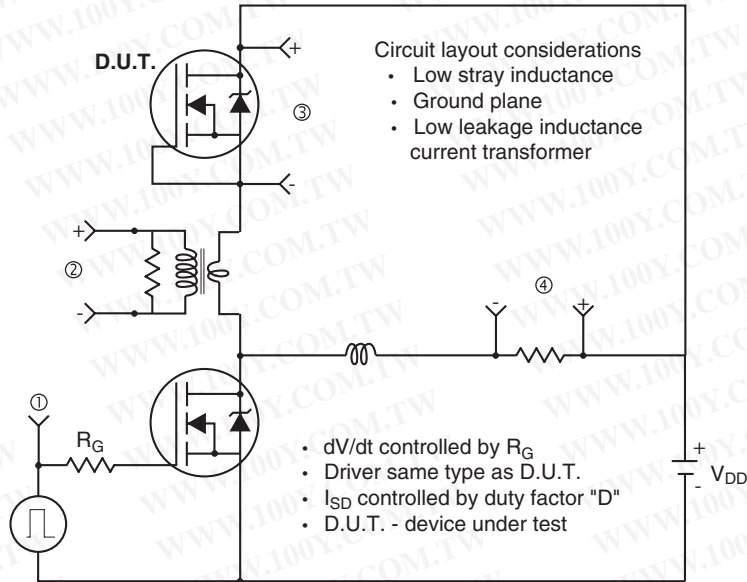


Fig. 13b - Gate Charge Test Circuit

Peak Diode Recovery dV/dt Test Circuit



* $V_{GS} = 5 V$ for logic level devices and $3 V$ drive devices

Fig. 14 - For N-Channel

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