40V N-Channel MOSFET

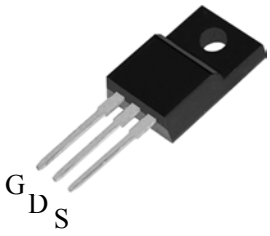
General Features

- Proprietary New Trench Technology
- $R_{DS(ON),typ.}$=2.2mΩ@V_{GS}=10V
- Low Gate Charge Minimize Switching Loss
- Fast Recovery Body Diode

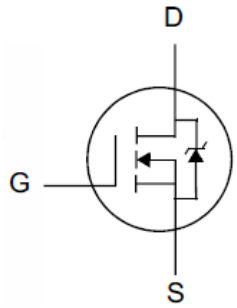
BV_{DSS}	$R_{DS(ON),typ.}$	I_D[2]
40V	2.2mΩ	240A

Applications

- High efficiency DC/DC Converters
- Synchronous Rectification
- UPS Inverter



TO-220F
Package No to Scale



Ordering Information

Part Number	Package
SK240N04-TF	TO-220F

Absolute Maximum Ratings

T_C=25℃ unless otherwise specified

Symbol	Parameter	SK240N04-TF	Unit
V_{DSS}	Drain-to-Source Voltage[1]	40	V
V_{GSS}	Gate-to-Source Voltage	±20	
I_D	Continuous Drain Current[2]	240	A
	Continuous Drain Current[3]	80	
I_{DM}	Pulsed Drain Current at V_{GS}=10V[2,4]	960	
E_{AS}	Single Pulse Avalanche Energy	1200	mJ
dv/dt	Peak Diode Recovery dv/dt[3]	5.0	V/ns
P_D	Power Dissipation	300	W
	Derating Factor above 25℃	2.0	W/℃
T_L T_{PAK}	Maximum Temperature for Soldering Leads at 0.063in (1.6mm) from Case for 10 seconds, Package Body for 10 seconds	300 260	℃
T_J& T_{STG}	Operating and Storage Temperature Range	-55 to 150	

Caution: Stresses greater than those listed in the "Absolute Maximum Ratings" may cause permanent damage to the device.

Thermal Characteristics

Symbol	Parameter	SK240N04-TF	Unit
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	0.5	℃/W
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	62	

Electrical Characteristics

OFF Characteristics

T_J =25℃ unless otherwise specified

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions
BV_{DSS}	Drain-to-Source Breakdown Voltage	40	--	--	V	V_{GS}=0V, I_D=250uA
I_{DSS}	Drain-to-Source Leakage Current	--	--	1	uA	V_{DS}=40V, V_{GS}=0V
		--	--	100		V_{DS}=32V, V_{GS}=0V, T_J =125℃
I_{GSS}	Gate-to-Source Leakage Current	--	--	+100	nA	V_{GS}=+20V, V_{DS}=0V
		--	--	-100		V_{GS}=-20V, V_{DS}=0V

ON Characteristics

T_J =25℃ unless otherwise specified

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions
$R_{DS(ON)}$	Static Drain-to-Source On-Resistance	--	2.2	3.0	mΩ	V_{GS}=10V, I_D=80A [5]
$V_{GS(TH)}$	Gate Threshold Voltage	2.0	--	4.0	V	V_{DS}=V_{GS}, I_D=250uA
gfs	Forward Transconductance	--	221	--	S	V_{DS}=10V,I_D=80A [5]

Dynamic Characteristics

Essentially independent of operating temperature

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions
C_{iss}	Input Capacitance	--	4.84	--	nF	V_{GS}=0V, V_{DS}=25V, f=1.0MHz
C_{rss}	Reverse Transfer Capacitance	--	0.43	--		
C_{oss}	Output Capacitance	--	0.68	--		
R_G	Gate Series Resistance	--	2.1	--	Ω	f=1.0MHz
Q_g	Total Gate Charge	--	95	--	nC	V_{DD}=20V, I_D=80A, V_{GS}=0 to 10V
Q_{gs}	Gate-to-Source Charge	--	27	--		
Q_{gd}	Gate-to-Drain (Miller) Charge	--	28	--		

Resistive Switching Characteristics

Essentially independent of operating temperature

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions
$t_{d(ON)}$	Turn-on Delay Time	--	21	--	ns	V_{DD}=20V, I_D=80A, V_{GS}= 10V R_G=2.5Ω
t_{rise}	Rise Time	--	22	--		
$t_{d(OFF)}$	Turn-Off Delay Time	--	53	--		
t_{fall}	Fall Time	--	21	--		

Source-Drain Body Diode Characteristics

T_J=25 unless otherwise specified

Symbol	Parameter	Min	Typ.	Max.	Unit	Test Conditions
I_{SD}	Continuous Source Current[2]	--	--	240	A	Integral PN-diode in MOSFET
I_{SM}	Pulsed Source Current[2]	--	--	960		
V_{SD}	Diode Forward Voltage	--	0.90	1.2	V	I_S=80A, V_{GS}=0V
trr	Reverse recovery time	--	46	--	ns	V_{GS}=0V ,I_F=80A, di_F/dt=100A/μs
Qrr	Reverse recovery charge	--	19	--	nC	

Typical Characteristics

Figure 1. Maximum Effective Thermal Impedance, Junction-to-Case

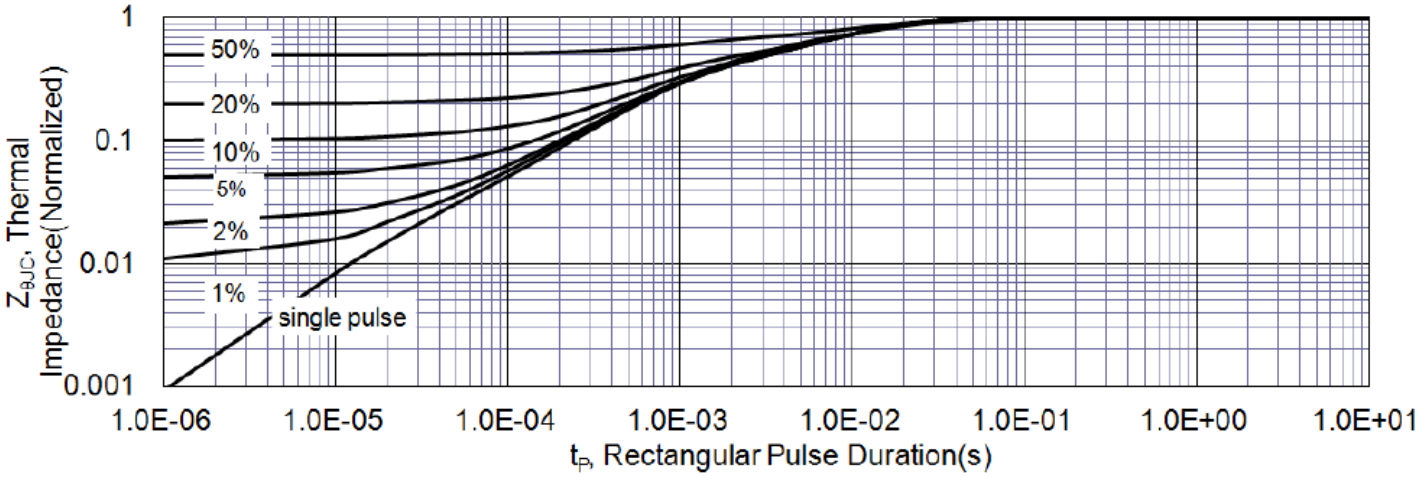


Figure 2. Maximum Power Dissipation vs Case Temperature

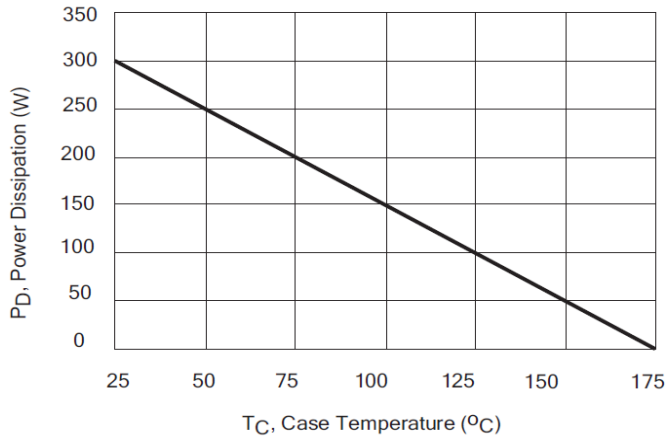


Figure3. Maximum Continuous Drain Current vs Case Temperature

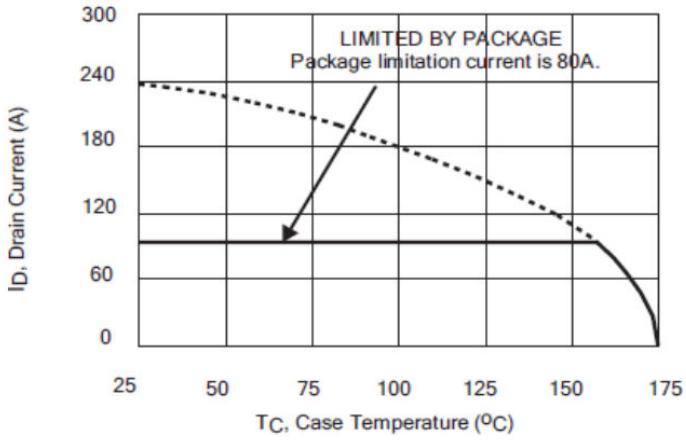


Figure 4. Typical Output Characteristics

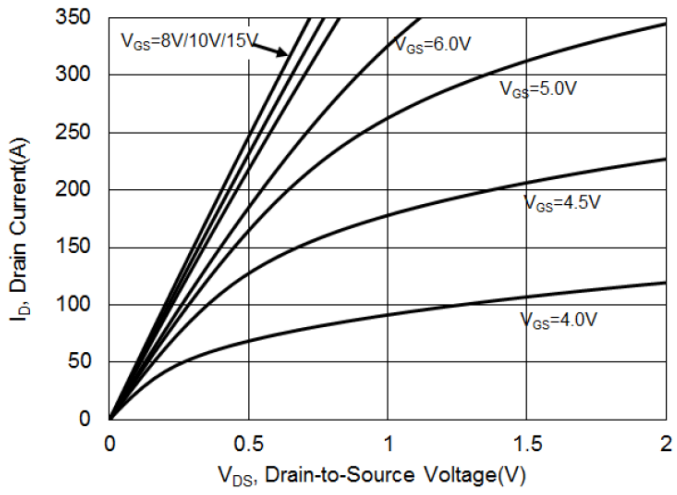
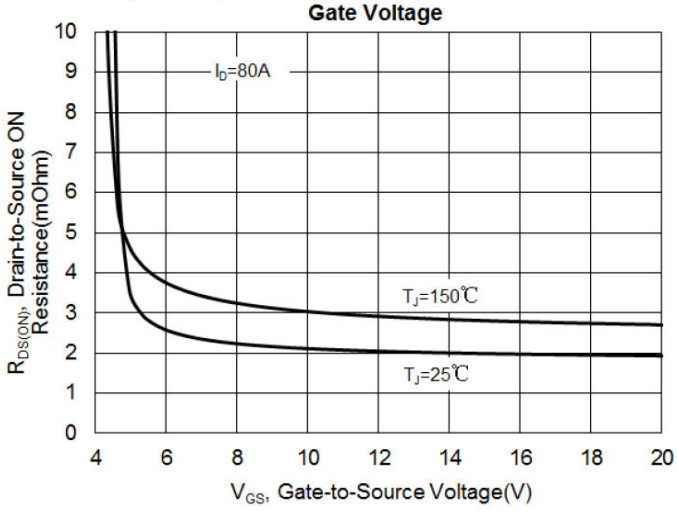


Figure 5. Typical Drain-to-Source ON Resistance vs. Gate Voltage



Typical Characteristics(Cont.)

Figure 6. Maximum Peak Current Capability

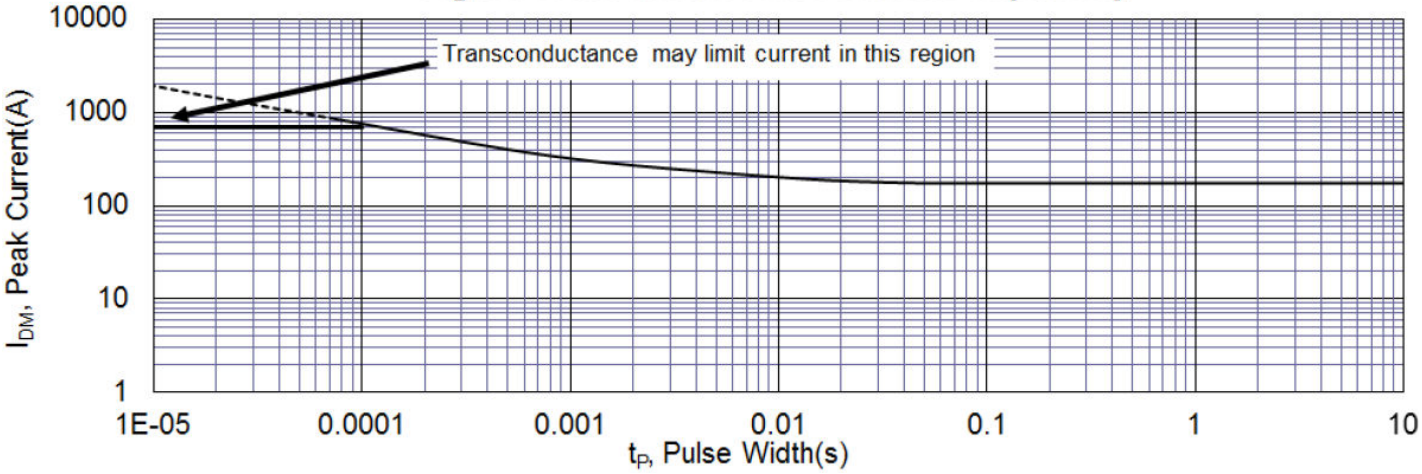


Figure 7. Typical Transfer Characteristics

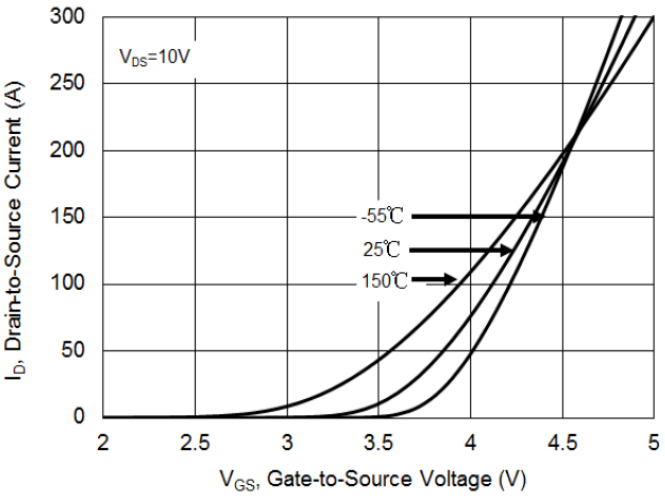


Figure 8. Unclamped Inductive Switching Capability

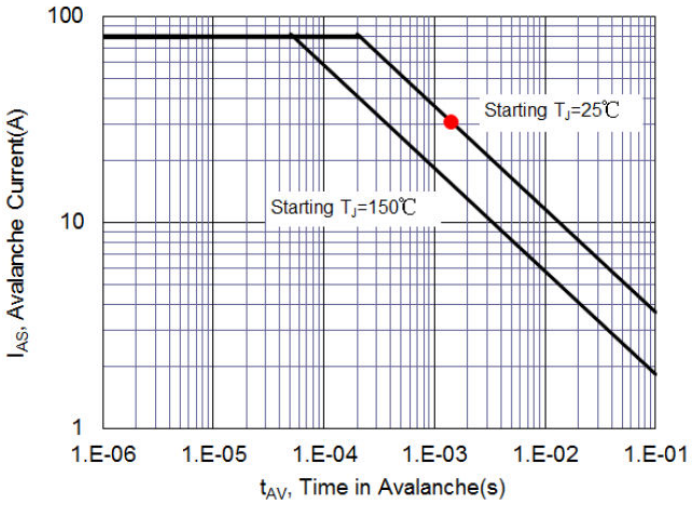


Figure 9. Typical Drain-to-Source ON Resistance

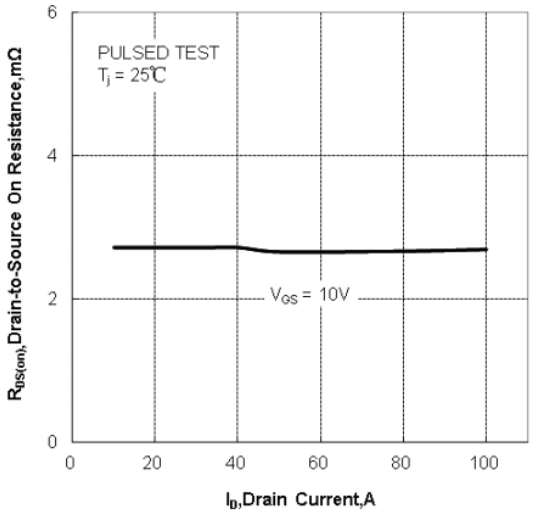
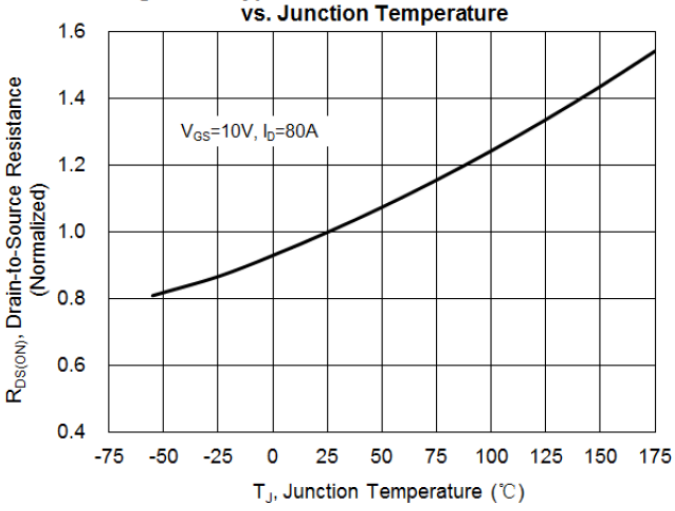


Figure 10. Typical Drain-to-Source On Resistance vs. Junction Temperature



Typical Characteristics(Cont.)

Figure 11.Typical Breakdown Voltage vs. Junction Temperature

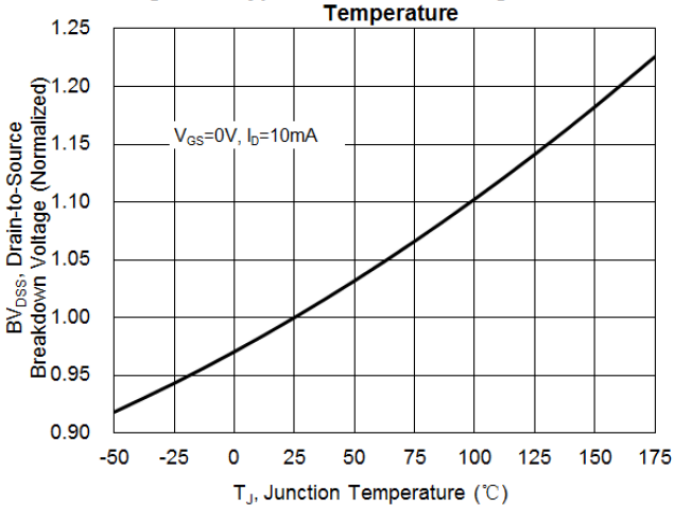


Figure 12.Typical Threshold Voltage vs. Junction Temperature

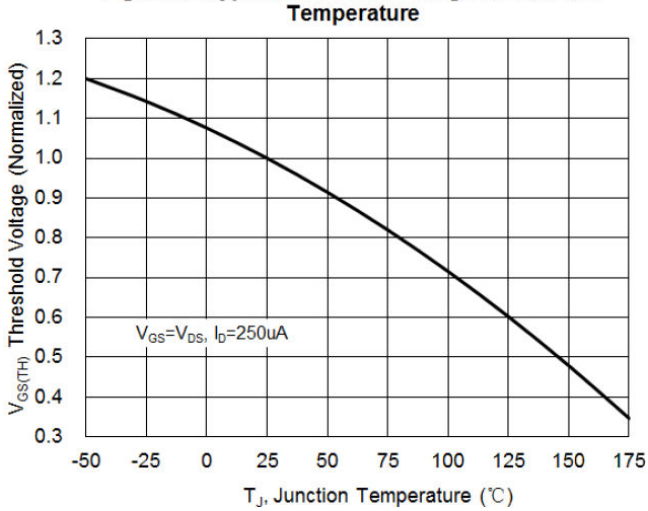


Figure 13. Maximum Forward Safe Operation Area

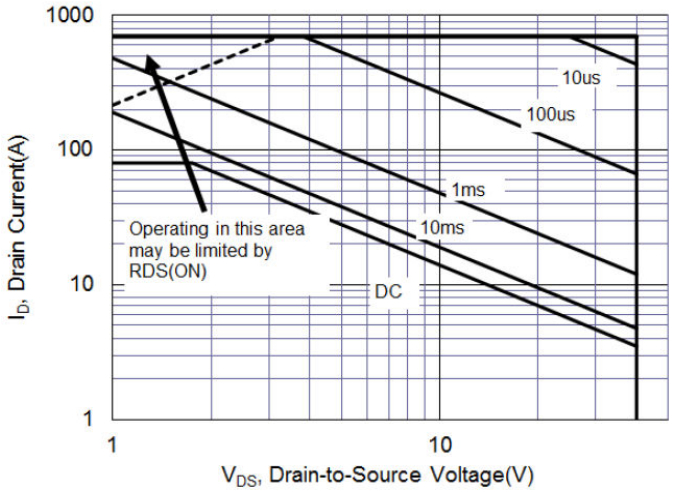


Figure 14. Typical Capacitance vs. Drain-to-Source Voltage

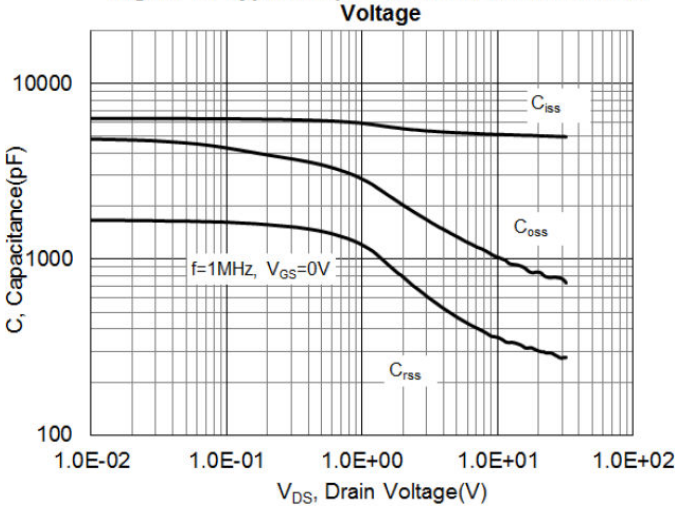


Figure 15. Typical Gate Charge vs. Gate-to-Source Voltage

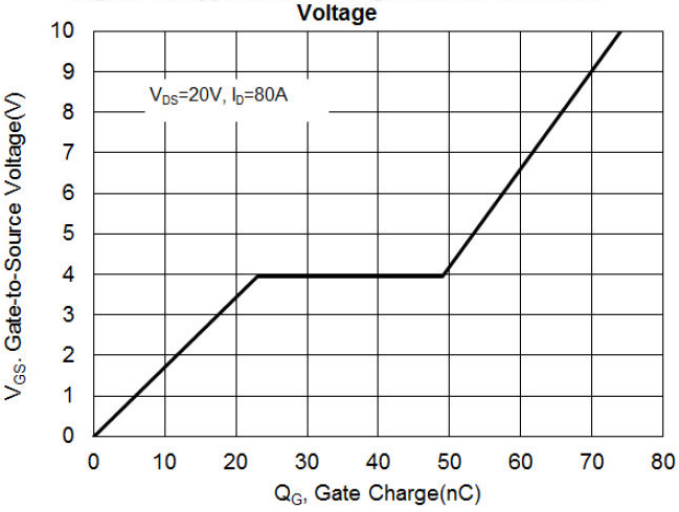
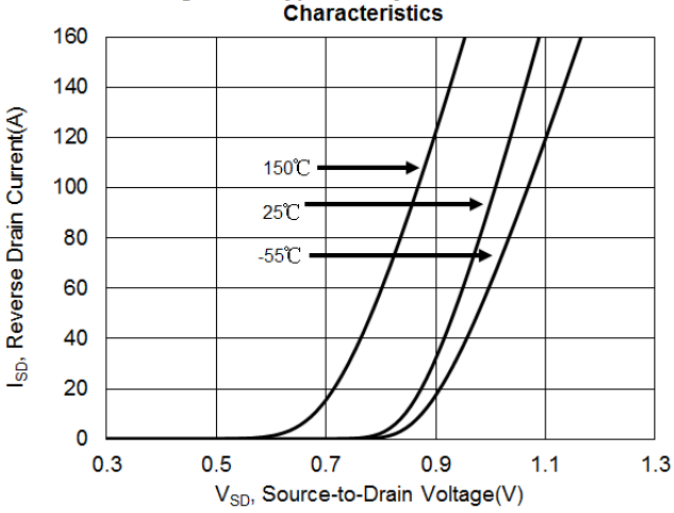


Figure 16. Typical Body Diode Transfer Characteristics



Test Circuits and Waveforms

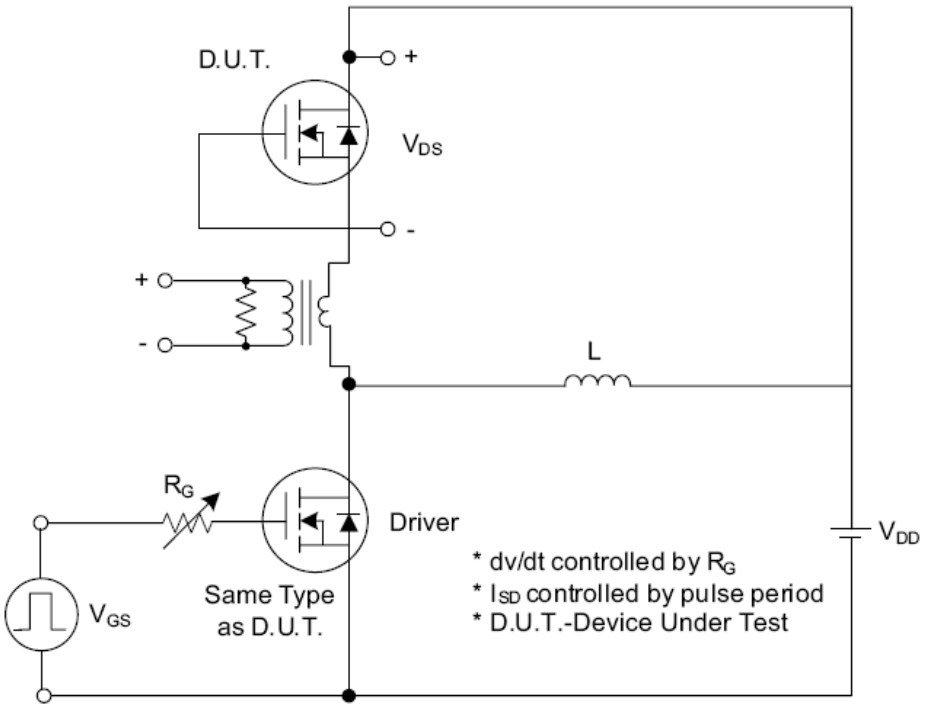


Fig. 1.1 Peak Diode Recovery dv/dt Test Circuit

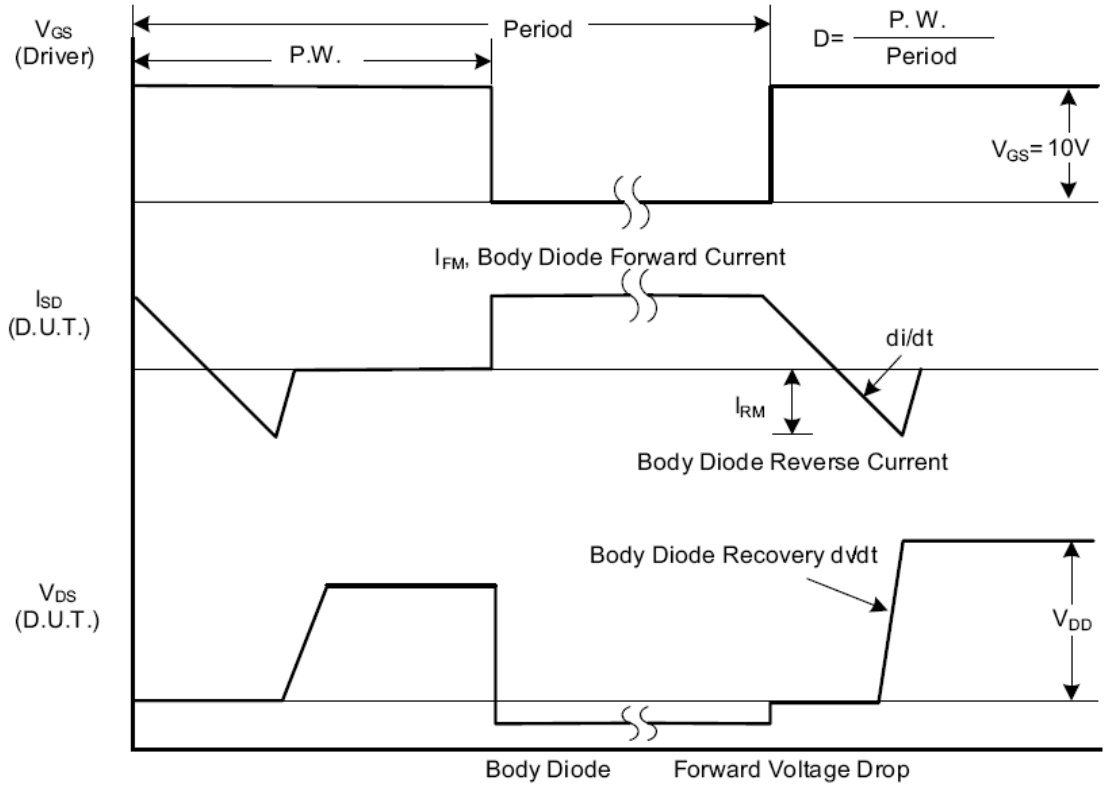


Fig. 1.2 Peak Diode Recovery dv/dt Waveforms

Test Circuits and Waveforms (Cont.)

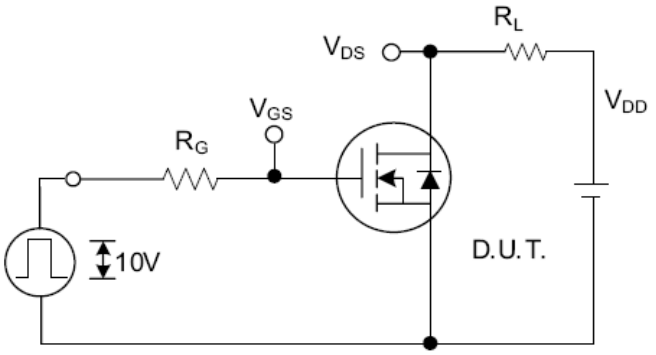


Fig. 2.1 Switching Test Circuit

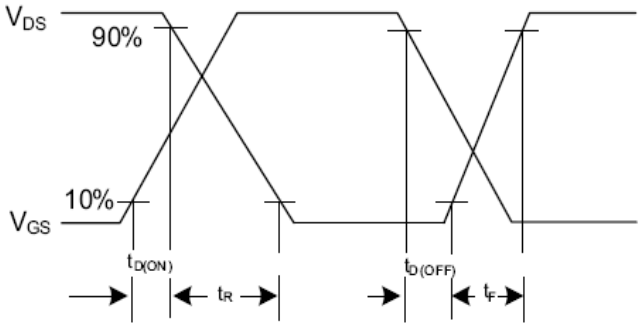


Fig. 2.2 Switching Waveforms

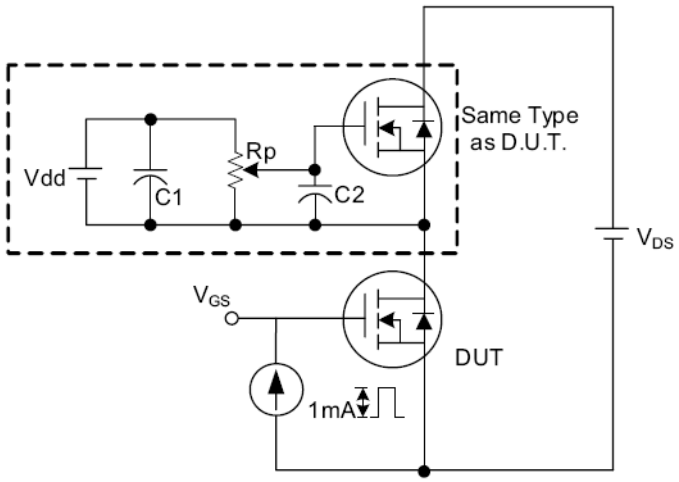


Fig. 3 . 1 Gate Charge Test Circuit

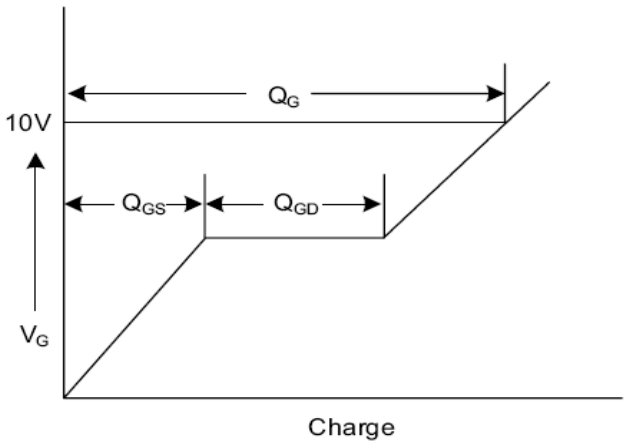


Fig. 3 . 2 Gate Charge Waveform

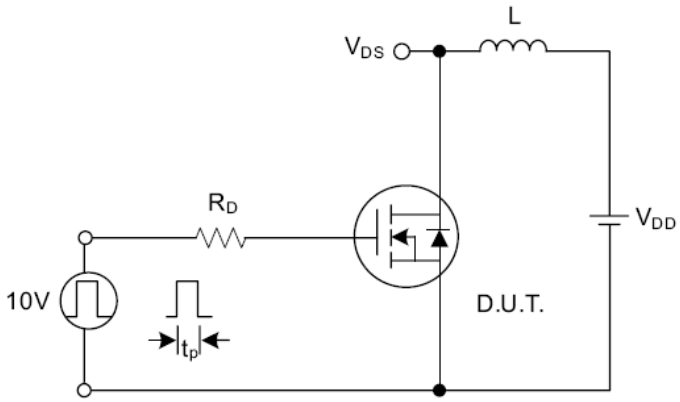


Fig. 4.1 Unclamped Inductive Switching Test Circuit

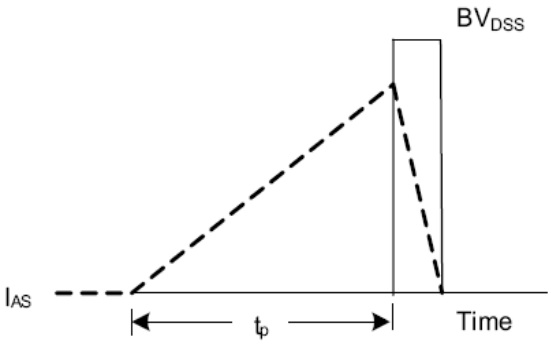


Fig. 4.2 Unclamped Inductive Switching Waveforms

X-ON Electronics

Largest Supplier of Electrical and Electronic Components

Click to view similar products for MOSFET ***category:***

Click to view products by Shikues ***manufacturer:***

Other Similar products are found below :

IRFD120 JANTX2N5237 BUK455-60A/B MIC4420CM-TR VN1206L NDP4060 SI4482DY IPS70R2K0CEAKMA1 SQD23N06-31L-GE3 TK16J60W,S1VQ(O 2SK2614(TE16L1,Q) DMN1017UCP3-7 DMN1053UCP4-7 SQJ469EP-T1-GE3 NTE2384 DMC2700UDMQ-7 DMN2080UCB4-7 DMN61D9UWQ-13 US6M2GTR DMN31D5UDJ-7 DMP22D4UFO-7B DMN1006UCA6-7 DMN16M9UCA6-7 STF5N65M6 IRF40H233XTMA1 STU5N65M6 DMN6022SSD-13 DMN13M9UCA6-7 DMTH10H4M6SPS-13 DMN2990UFB-7B IPB80P04P405ATMA2 2N7002W-G MCAC30N06Y-TP MCQ7328-TP NTMC083NP10M5L BXP7N65D BXP4N65F AOL1454G WMJ80N60C4 BXP2N20L BXP2N65D BXT1150N10J BXT1700P06M TSM60NB380CP ROG RQ7L055BGTCR DMNH15H110SK3-13 SLF10N65ABV2 BSO203SP BSO211P IPA60R230P6