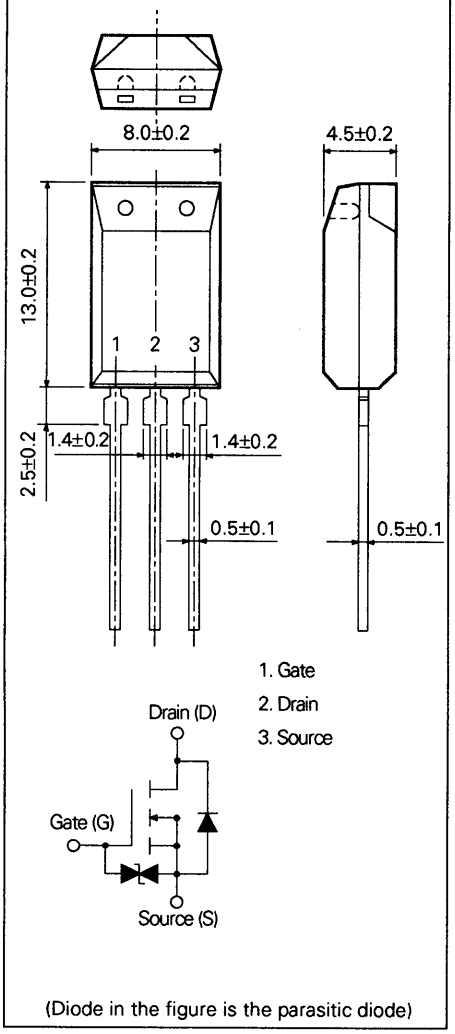
NEC

MOS FIELD EFFECT POWER TRANSISTOR
2SK2132

SWITCHING
N-CHANNEL POWER MOS FET
INDUSTRIAL USE

PACKAGE DIMENSIONS
(Unit : mm)



(Diode in the figure is the parasitic diode)

DESCRIPTION

The 2SK2132 is N-channel Power MOS Field Effect Transistor designed for high voltage switching applications.

FEATURES

- Low On-state Resistance
  $R_{DS(on)}$ = 0.65 Ω MAX. (V_{GS} = 10 V, I_D = 2.0 A)
- Low C_{iss} C_{iss} = 300 pF TYP.
- Built-in G-S Gate Protection Diodes
- High Avalanche Capability Ratings

QUALITY GRADE

Standard

Please refer to "Quality grade on NEC Semiconductor Devices" (Document number IEI-1209) published by NEC Corporation to know the specification of quality grade on the devices and its recommended applications.

ABSOLUTE MAXIMUM RATINGS

Maximum Temperatures			
Storage Temperature		−55 to +150	°C
Channel Temperature		150	°C MAX.
Maximum Power Dissipation			
Total Power Dissipation (T_a = 25 °C)		1.8	W
Maximum Voltages and Currents (T_a = 25 °C)			
V_{DSS}	Drain to Source Voltage	180	V
V_{GSS}	Gate to Source Voltage	±20	V
$I_{D(DS)}$	Drain Current (DC)	±4.0	A
$I_{D(pulse)}$*	Drain Current (pulse)	±16	A
Maximum Avalanche Capability Ratings**			
I_{AS}	Single Avalanche Current	4.0	A
E_{AS}	Single Avalanche Energy	51.2	mJ

* PW ≦ 10 μs, Duty Cycle ≦ 1 %

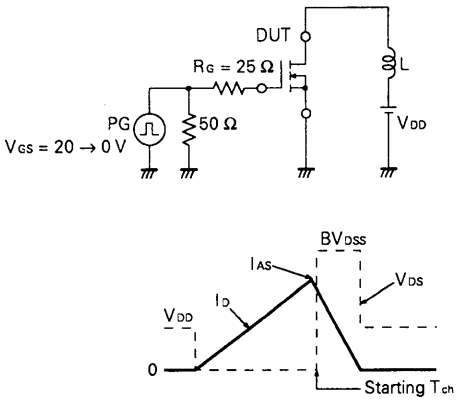
** Starting T_{ch} = 25 °C, R_G = 25 Ω, V_{GS} = 20 V → 0

Document No. TC-2370
(O.D.No. TC-7919)
Date Published January 1993 M
Printed in Japan

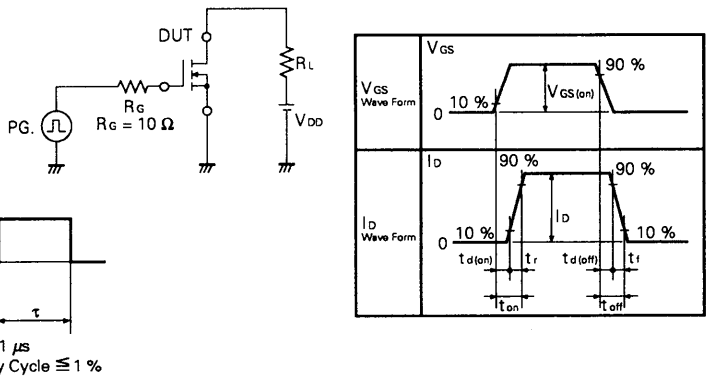
ELECTRICAL CHARACTERISTICS (T_a = 25 °C)

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Drian to Source On-state Resistance	R_{DS} (on)		0.52	0.65	Ω	V_{GS} = 10 V, I_D = 18 A
Gate to Source Cutoff Voltage	V_{GS} (off)	2.0		4.0	V	V_{DS} = 10 V, I_D = 1 mA
Forward Transfer Admittance	$\|y_{fs}\|$	0.5			S	V_{DS} = 10 V, I_D = 18 A
Drain Leakage Current	I_{DSS}			100	μA	V_{DS} = 500 V, V_{GS} = 0
Gate to Source Leakage Current	I_{GSS}			±10	μA	V_{GS} = ±20 V, V_{DS} = 0
Input Capacitance	C_{iss}		300		pF	V_{DS} = 10 V V_{GS} = 0 f = 1 MHz
Output Capacitance	C_{oss}		170		pF	
Reverse Transfer Capacitance	C_{rss}		50		pF	
Turn-On Delay Time	t_{d} (on)		9.0		ns	V_{GS} = 10 V V_{DD} = 100 V I_D = 2 A, R_G = 10 Ω R_L = 50 Ω
Rise Time	t_r		10		ns	
Turn-Off Delay Time	t_{d} (off)		28		ns	
Fall Time	t_f		12		ns	
Total Gate Charge	Q_G		10		nC	V_{GS} = 10 V I_D = 2 A V_{DD} = 140 V
Gate to Source Charge	Q_{GS}		2.3		nC	
Gate to Drain Charge	Q_{GD}		4.7		nC	
Diode Forward Voltage	$V_{F(S-D)}$		0.9		V	I_F = 2 A, V_{GS} = 0
Reverse Recovery Time	t_{rr}		180		ns	I_F = 2 A di / dt = 50 A/μs
Reverse Recovery Charge	Q_{rr}		0.5		μC	

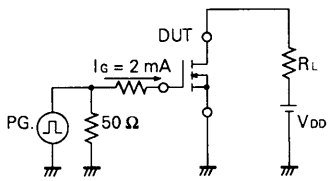
Test Circuit 1 : Avalanche Capability



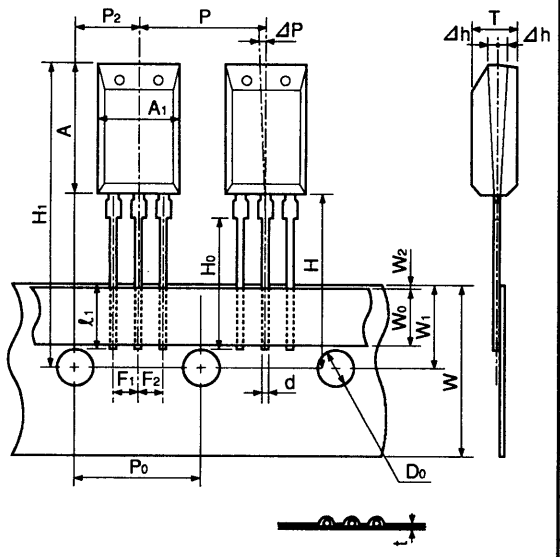
Test Circuit 2 : Switching Time



Test Circuit 3 : Gate Charge



Radial Tape Specification

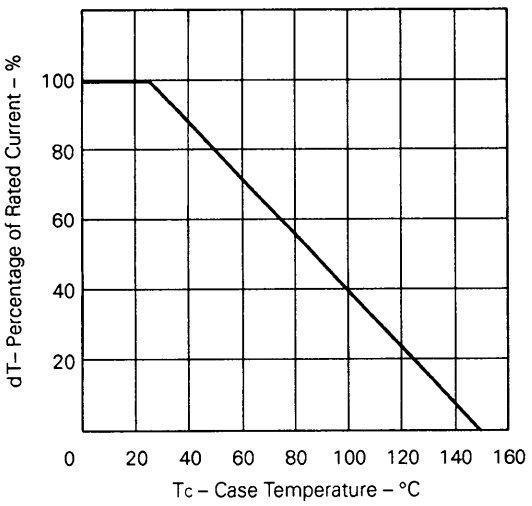


Dimension (unit : mm)

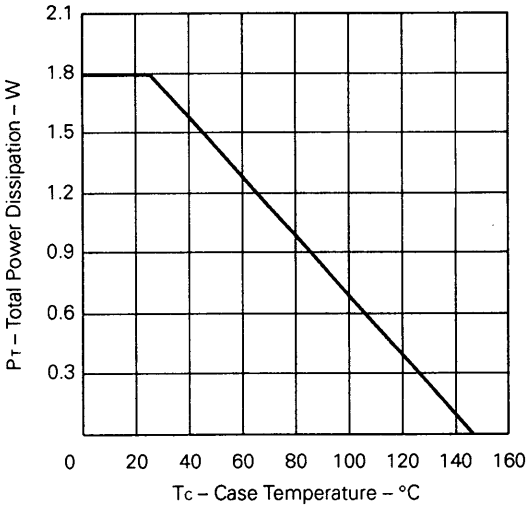
Item		
Component Body Length along Tape	A_1	8.0 ± 0.2
Component Body Height	A	13.0 ± 0.2
Component Body Width	T	4.5 ± 0.2
Component Lead Width Dimension	d	0.5 ± 0.1
Lead Wire Enclosure	l_1	2.5 MIN.
Component Center Pitch	P	12.7 ± 1.0
Feedhole Pitch	P_0	12.7 ± 0.3
Feedhole Center to Center Lead	P_2	6.35 ± 0.5
Component Lead Pitch	F_1, F_2	$2.5^{+0.4}_{-0.1}$
Deflection Front or Rear	Δh	± 1.0
Deflection Left or Right	ΔP	± 1.3
Carrier Strip Width	W	$18.0^{+1.0}_{-0.5}$
Adhesive Tape Width	W_0	5.0 MIN.
Feedhole Location	W_1	9.0 ± 0.5
Adhesive Tape Position	W_2	0.7 MIN.
Height of Seating Plane	H_0	16.0 ± 0.5
Feedhole to upper of Component	H_1	32.2 MAX.
Feedhole to Bottom of Component	H	20.0 MAX.
Tape Feedhole Diameter	D_0	4.0 ± 0.2
Overall Taped Package Thickness	t	0.7 ± 0.2

TYPICAL CHARACTERISTICS (T_a = 25 °C)

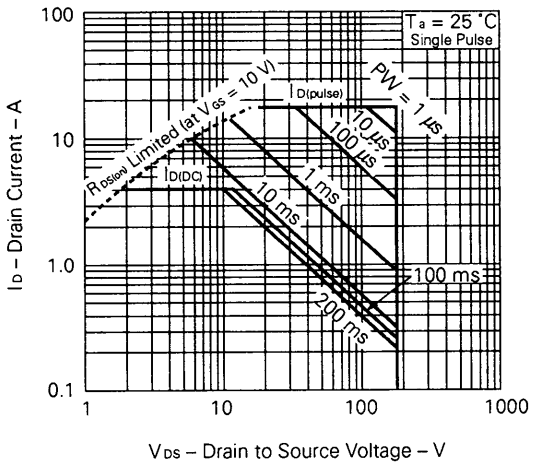
DERATING FACTOR OF FORWARD BIAS SAFE OPERATING AREA



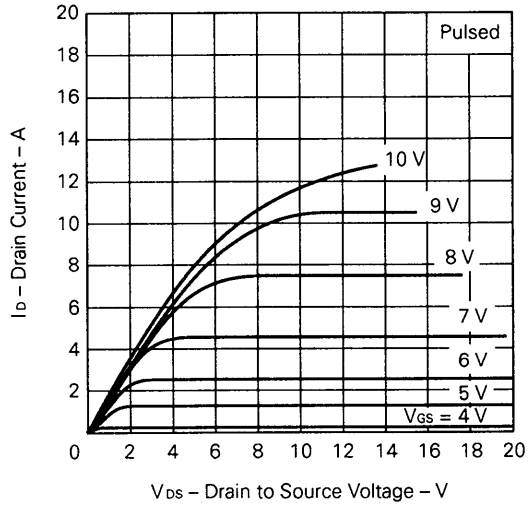
TOTAL POWER DISSIPATION vs. CASE TEMPERATURE



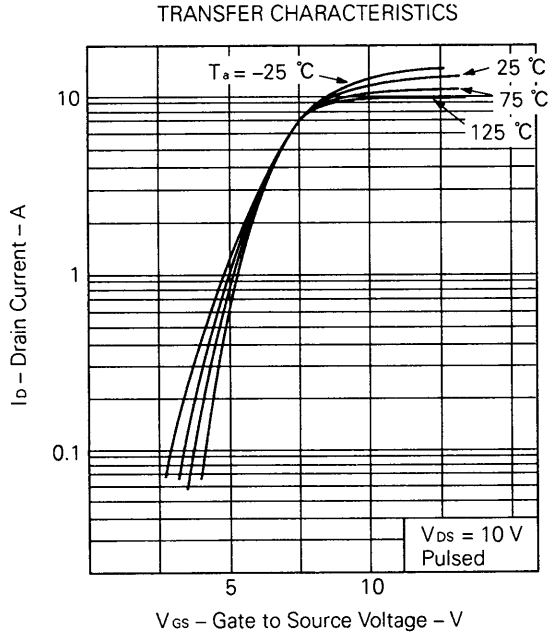
FORWARD BIAS SAFE OPERATING AREA



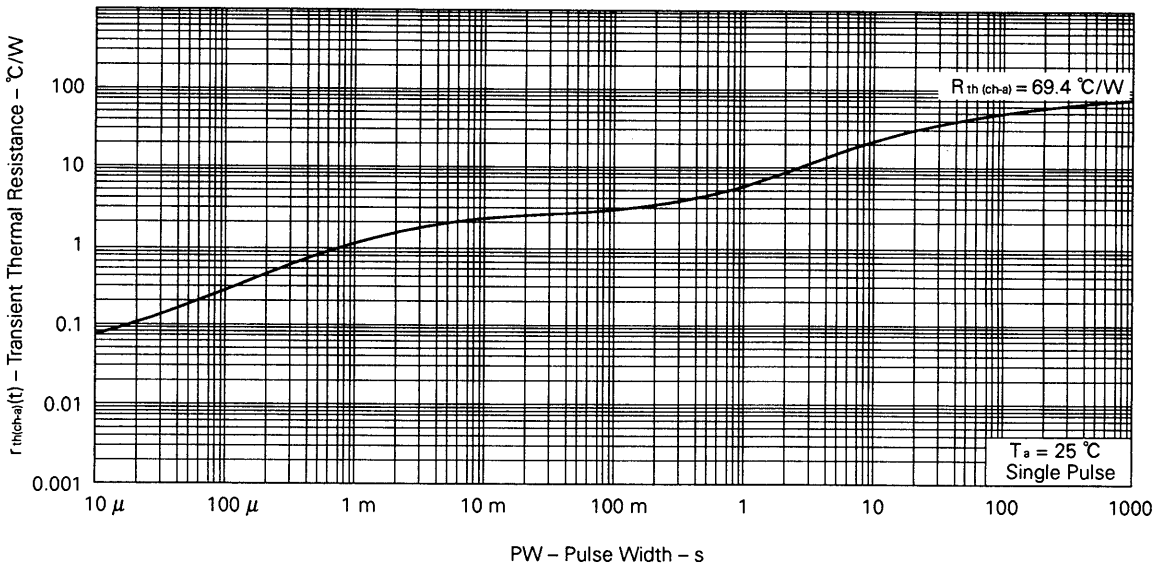
DRAIN CURRENT vs. DRAIN TO SOURCE VOLTAGE



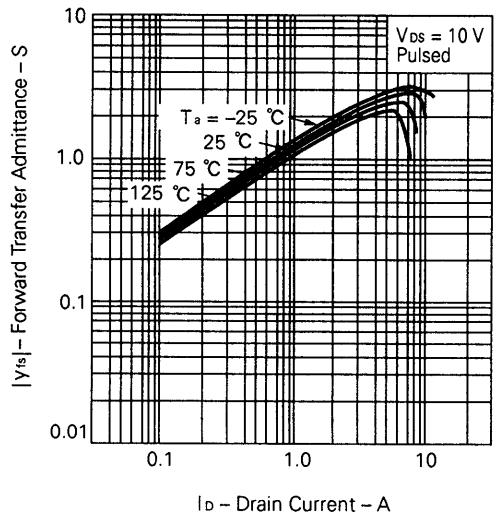
TRANSFER CHARACTERISTICS



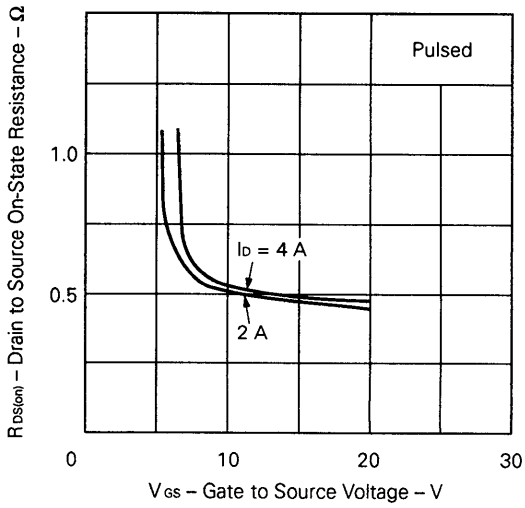
TRANSIENT THERMAL RESISTANCE vs. PULSE WIDTH



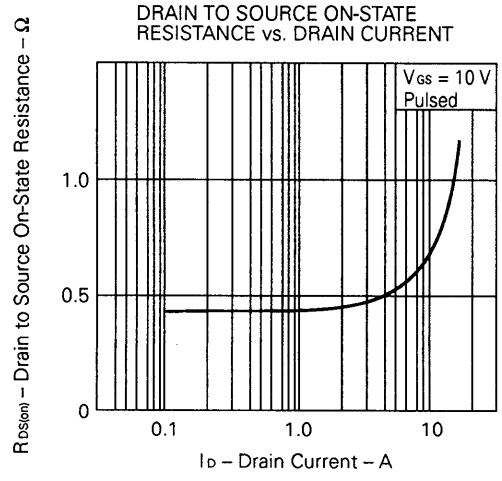
FORWARD TRANSFER ADMITTANCE vs. DRAIN CURRENT



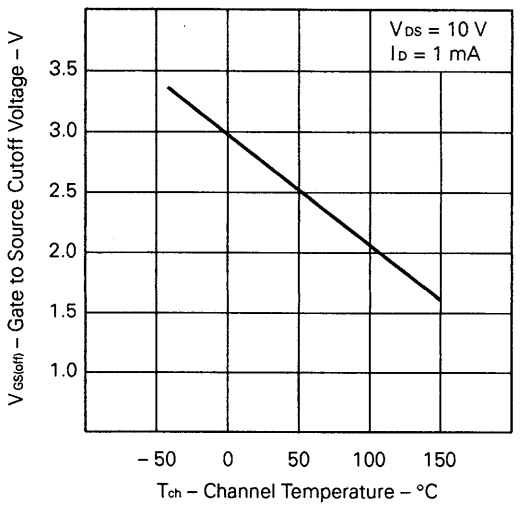
DRAIN TO SOURCE ON-STATE RESISTANCE vs. GATE TO SOURCE VOLTAGE



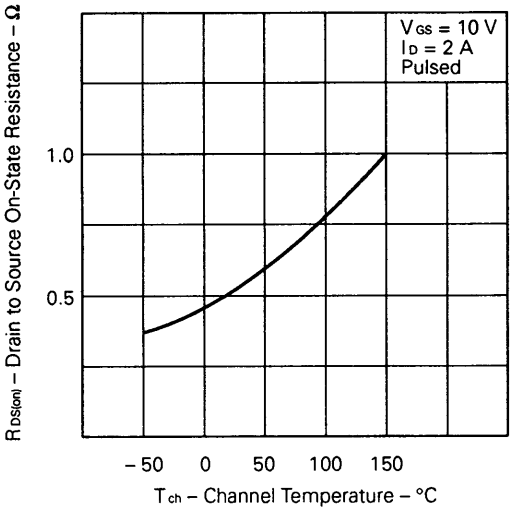
DRAIN TO SOURCE ON-STATE RESISTANCE vs. DRAIN CURRENT



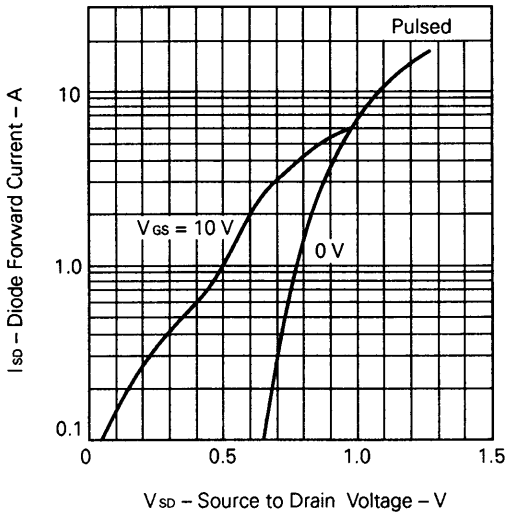
GATE TO SOURCE CUTOFF VOLTAGE vs. CHANNEL TEMPERATURE



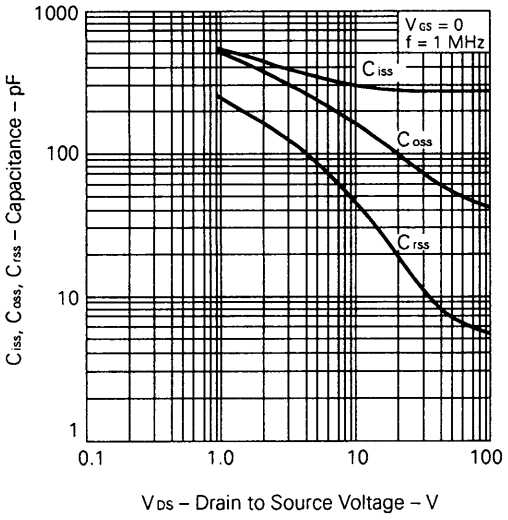
DRAIN TO SOURCE ON - STATE RESISTANCE vs. CHANNEL TEMPERATURE



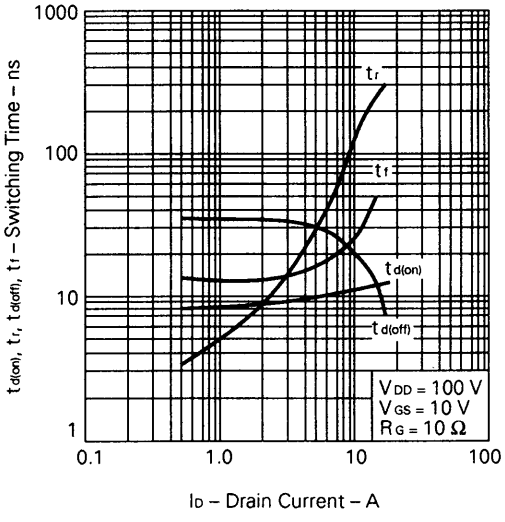
SOURCE TO DRAIN DIODE FORWARD VOLTAGE



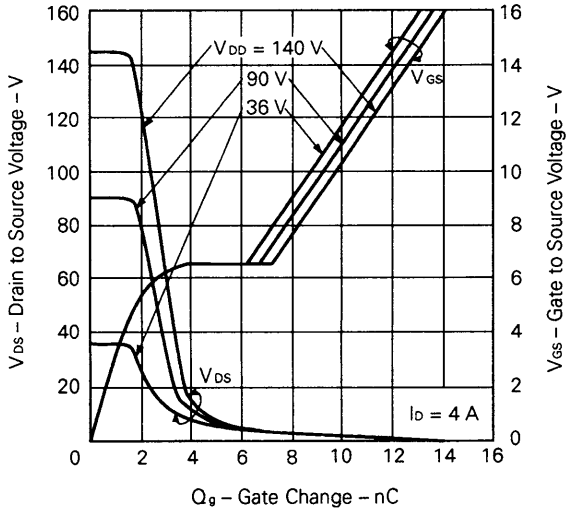
CAPACITANCE vs. DRAIN TO SOURCE VOLTAGE



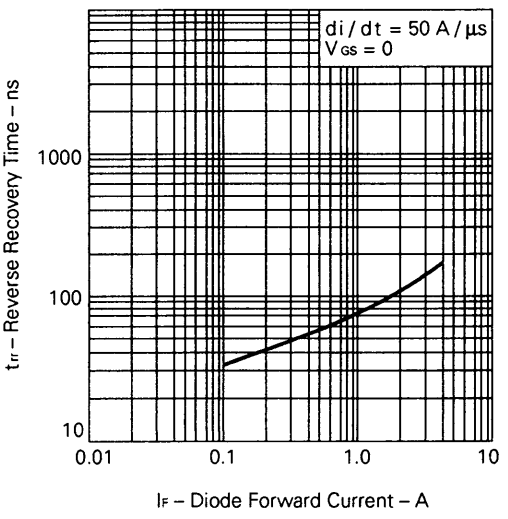
SWITCHING CHARACTERISTICS



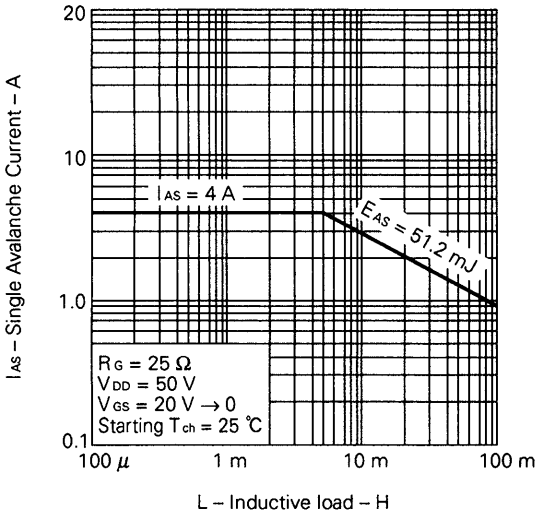
DYNAMIC INPUT CHARACTERISTICS



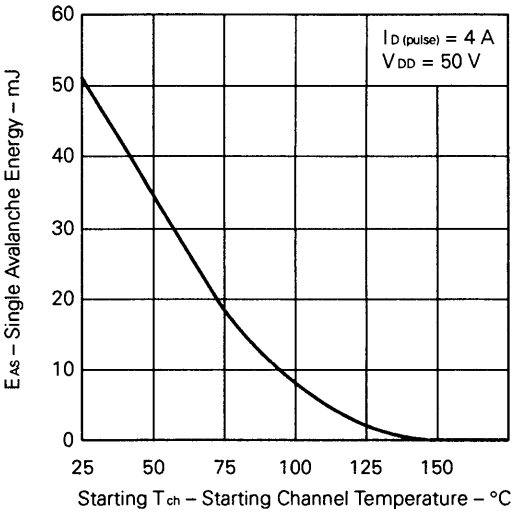
REVERSE RECOVERY TIME vs. DIODE FORWARD CURRENT



SINGLE AVALANCE CURRENT vs.
INDUCTIVE LOAD



SINGLE AVALANCHE ENERGY vs.
STARTING CHANNEL TEMPERATURE



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