

N-CHANNEL POWER MOS FET ARRAY SWITCHING INDUSTRIAL USE

DESCRIPTION

The μPA1572B is N-channel Power MOS FET Array that built in 4 circuits designed for solenoid, motor and lamp driver.

FEATURES

- Full Mold Package with 4 Circuits
- 4 V driving is possible
- Low On-state Resistance
 $R_{DS(on)} = 0.6 \Omega \text{ MAX. (} V_{GS} = 10 \text{ V, } I_D = 1 \text{ A)}$
 $R_{DS(on)} = 0.8 \Omega \text{ MAX. (} V_{GS} = 4 \text{ V, } I_D = 1 \text{ A)}$
- Low Input Capacitance $C_{iss} = 110 \text{ pF TYP.}$

ORDERING INFORMATION

Type Number	Package
μPA1572BH	10Pin SIP

ABSOLUTE MAXIMUM RATINGS (T_A = 25 °C)

Drain to Source Voltage (V _{GS} = 0)	V _{DSS}	60	V
Gate to Source Voltage (V _{DS} = 0)	V _{GSS (AC)}	±20	V
Drain Current (DC)	I _{D (DS)}	±2.0	A/unit
Drain Current (pulse)	I _{D (pulse) *1}	±6.0	A/unit
Total Power Dissipation	P _{T1 *2}	20	W
Total Power Dissipation	P _{T2 *3}	3.0	W
Channel Temperature	T _{CH}	150	°C
Storage Temperature	T _{stg}	-55 to +150	°C
Single Avalanche Current	I _{AS *4}	5.0	A
Single Avalanche Energy	E _{AS *4}	0.1	mJ

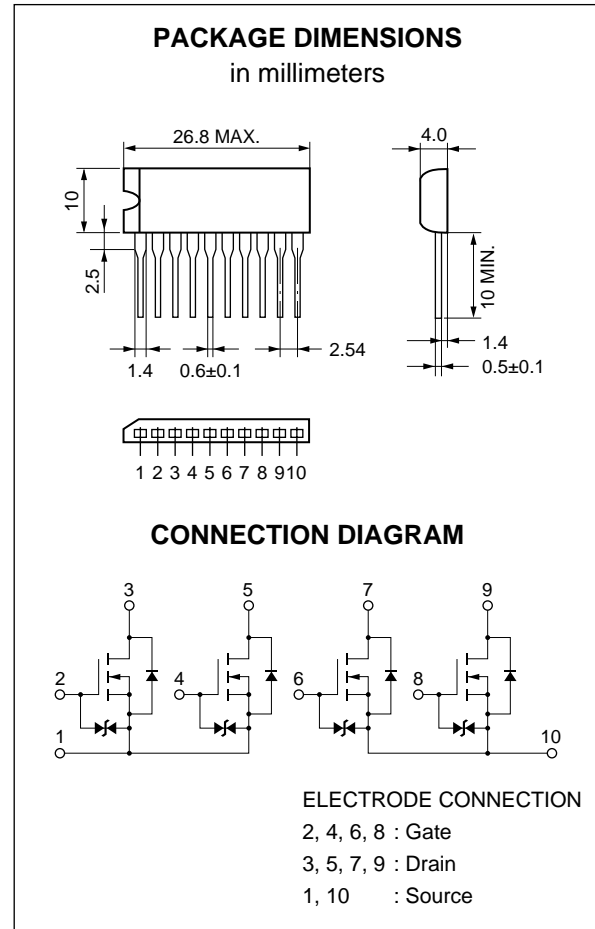
*1 $PW \leq 10 \mu s$, Duty Cycle $\leq 1 \%$ *2 4 Circuits T_c = 25 °C

*3 4 Circuits T_A = 25 °C

*4 Starting T_{CH} = 25 °C, V_{DD} = 30 V, V_{GS} = 20 V → 0, R_G = 25 Ω, L = 100 μH

Build-in Gate Diodes are for protection from static electricity in handing.
In case high voltage over V_{GSS} is applied, please append gate protection circuits.

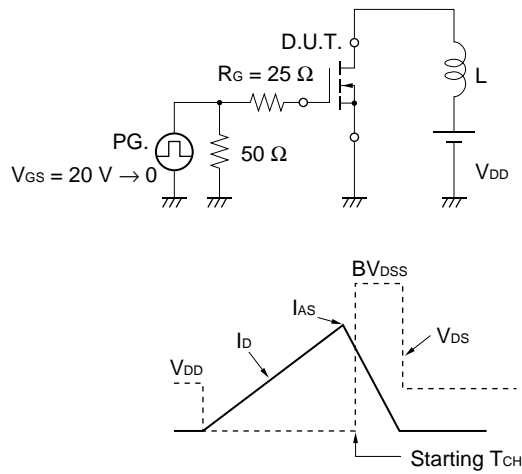
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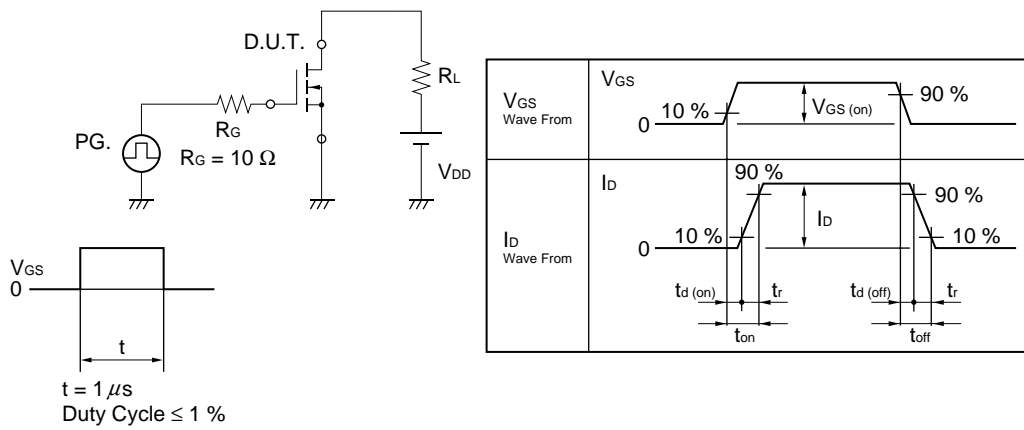
ELECTRICAL CHARACTERISTICS (T_A = 25 °C)

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITION
Drain Leakage Current	I _{DSS}			10	μA	V _{DS} = 60 V, V _{GS} = 0
Gate Leakage Current	I _{GSS}			±10	μA	V _{GS} = ±20 V, V _{DS} = 0
Gate Cutoff Voltage	V _{GS (off)}	1.0		2.0	V	V _{DS} = 10 V, I _D = 1.0 mA
Forward Transfer Admittance	Y _{fs}	0.5			S	V _{DS} = 10 V, I _D = 1.0 A
Drain to Source ON-Resistance	R _{DS (on)1}		0.3	0.6	Ω	V _{GS} = 10 V, I _D = 1.0 A
Drain to Source ON-Resistance	R _{DS (on)2}		0.4	0.8	Ω	V _{GS} = 4.0 V, I _D = 1.0 A
Input Capacitance	C _{iss}		110		pF	V _{DS} = 10 V, V _{GS} = 0, f = 1.0 MHz
Output Capacitance	C _{oss}		70		pF	
Reverse Transfer Capacitance	C _{rss}		25		pF	
Turn-on Delay Time	t _{d (on)}		30		ns	I _D = 1.0 A, V _{GS (on)} = 10 V, V _{DD} = 30 V, R _L = 30 Ω
Rise Time	t _r		200		ns	
Turn-off Delay Time	t _{d (off)}		100		ns	
Fall Time	t _f		160		ns	
Total Gate Charge	Q _G		5.4		nC	V _{GS} = 10 V, I _D = 2.0 A, V _{DD} = 48 V
Gate to Source Charge	Q _{GS}		0.7		nC	
Gate to Drain Charge	Q _{GD}		2.0		nC	
Body Diode Forward Voltage	V _{F (S-D)}		1.0		V	I _F = 2.0 A, V _{GS} = 0
Reverse Recovery Time	t _{rr}		130		ns	I _F = 2.0 A, V _{GS} = 0, di/dt = 50 A/μs
Reverse Recovery Charge	Q _{rr}		110		nC	

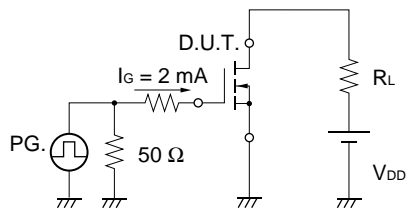
Test Circuit 1 Avalanche Capability



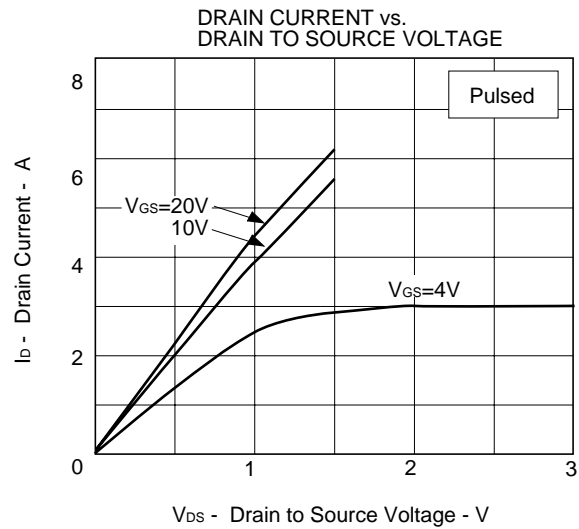
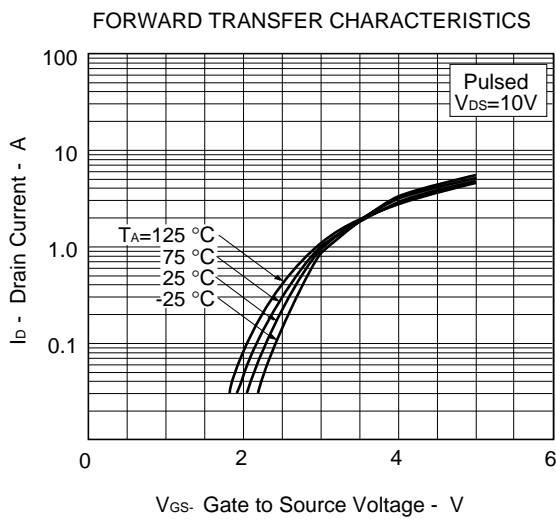
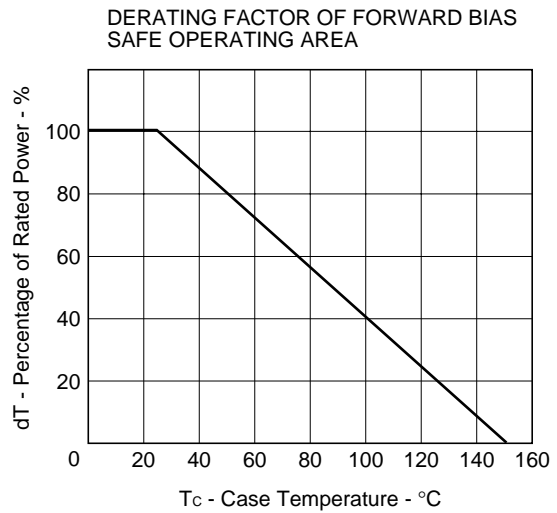
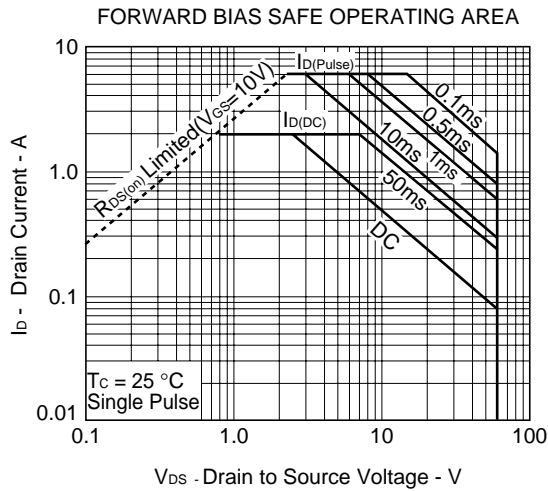
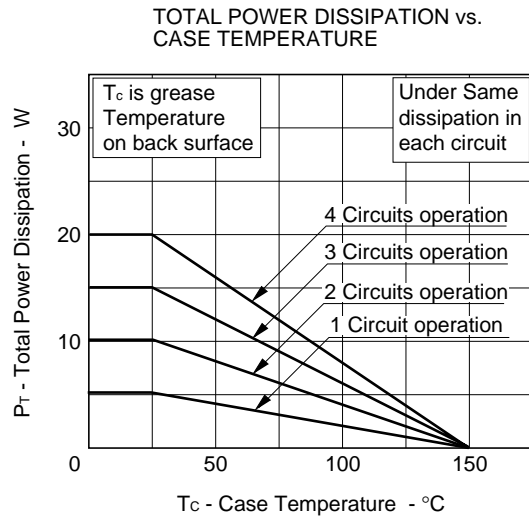
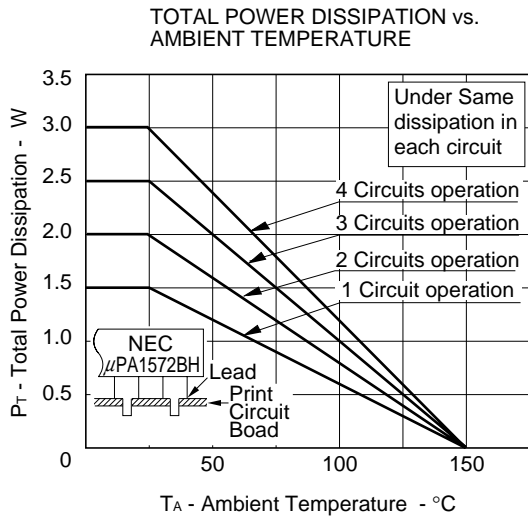
Test Circuit 2 Switching Time



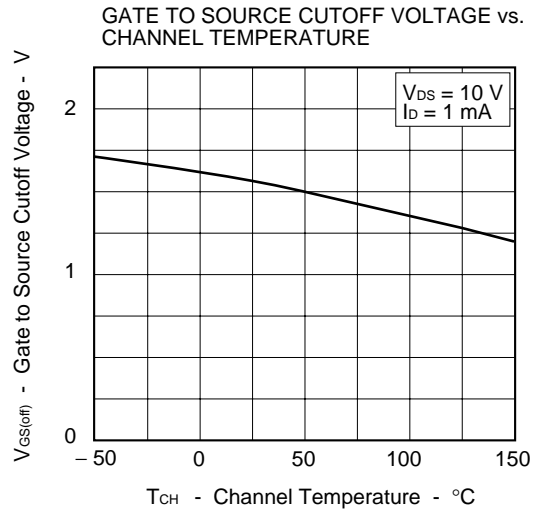
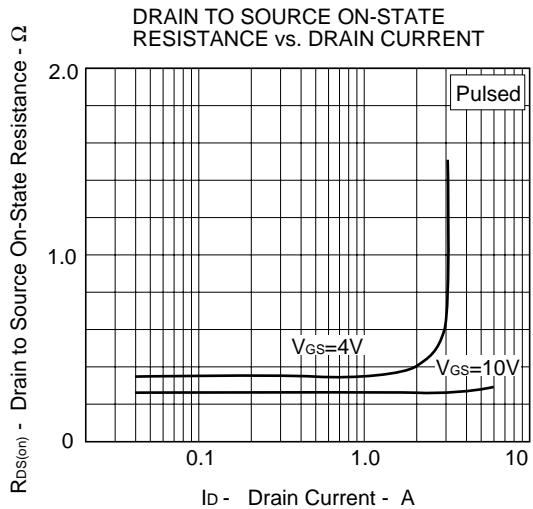
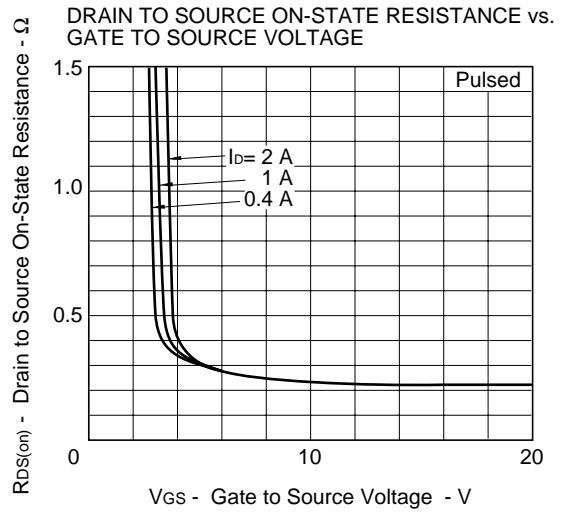
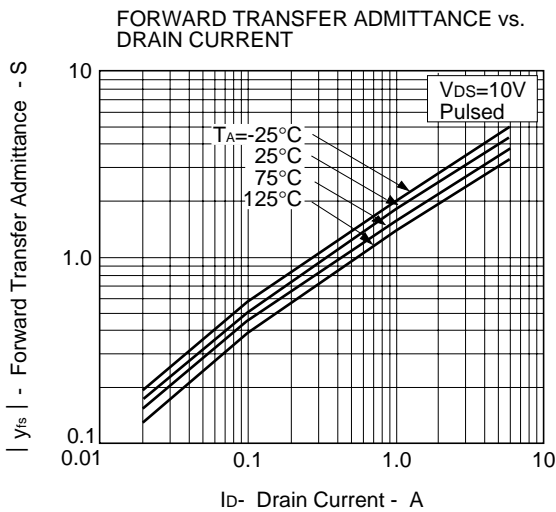
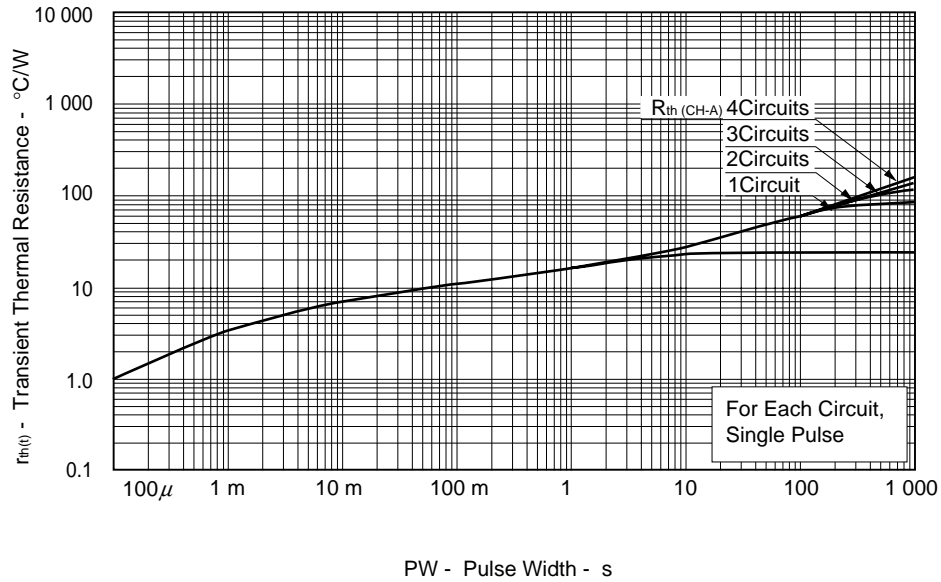
Test Circuit 3 Gate Charge



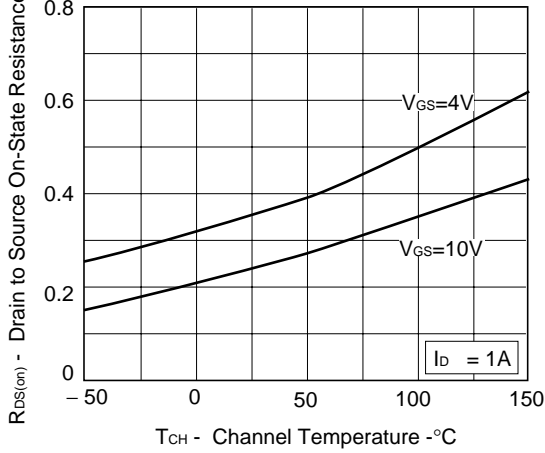
CHARACTERISTICS ($T_A = 25^\circ\text{C}$)



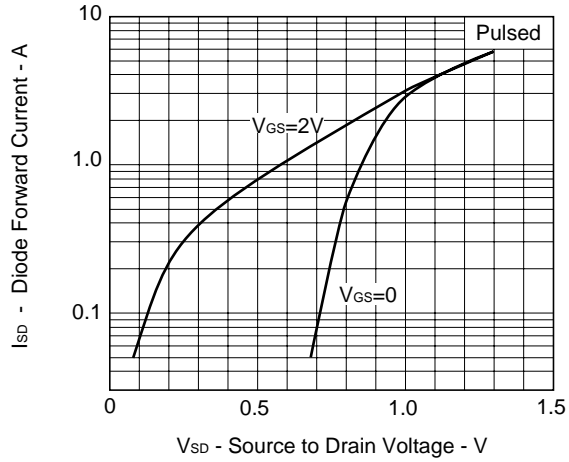
TRANSIENT THERMAL RESISTANCE vs. PULSE WIDTH



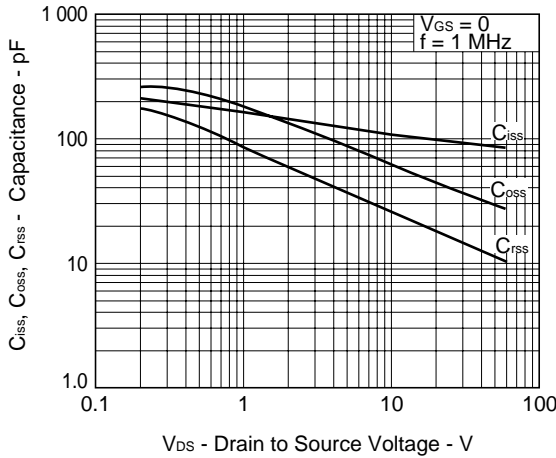
DRAIN TO SOURCE ON-STATE RESISTANCE vs. CHANNEL TEMPERATURE



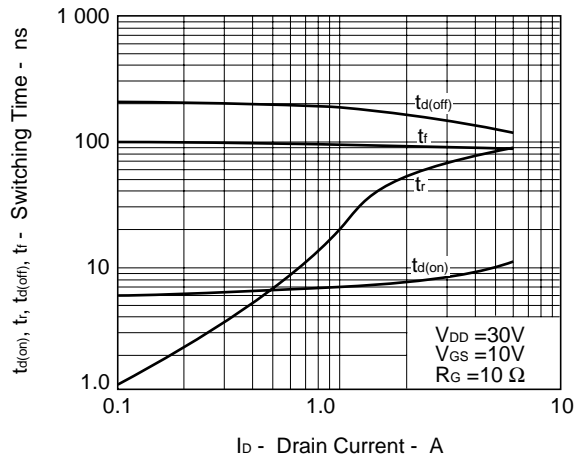
SOURCE TO DRAIN DIODE FORWARD VOLTAGE



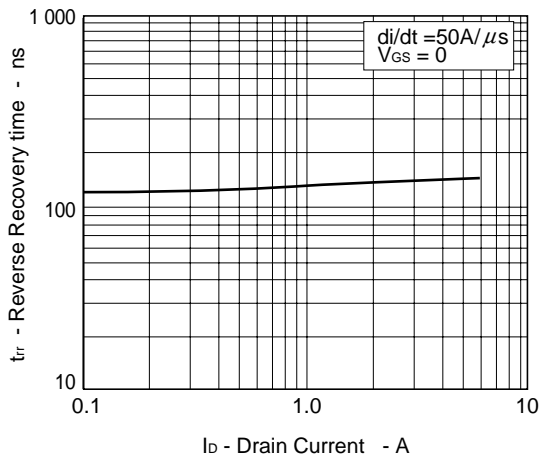
CAPACITANCE vs. DRAIN TO SOURCE VOLTAGE



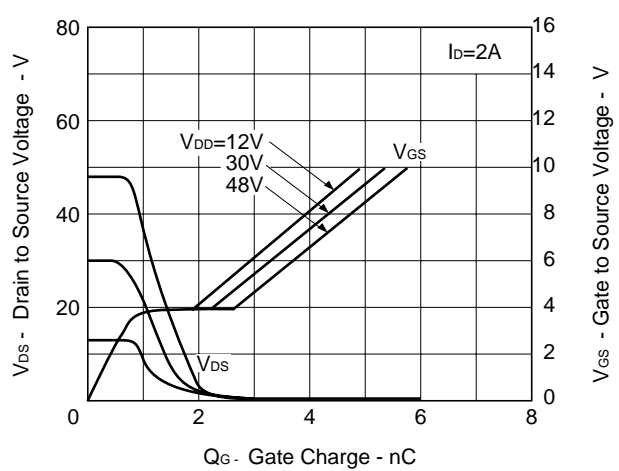
SWITCHING CHARACTERISTICS

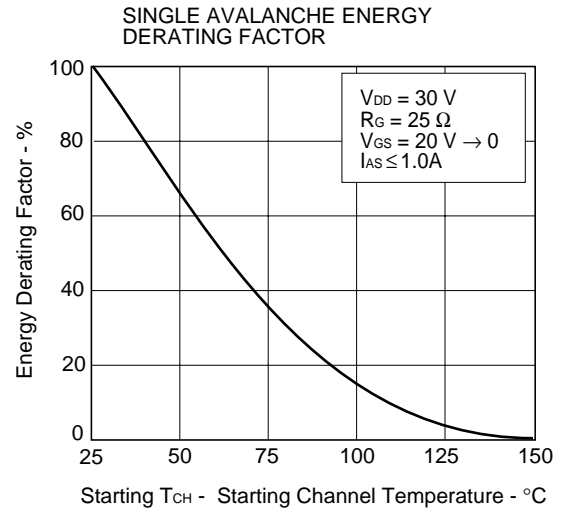
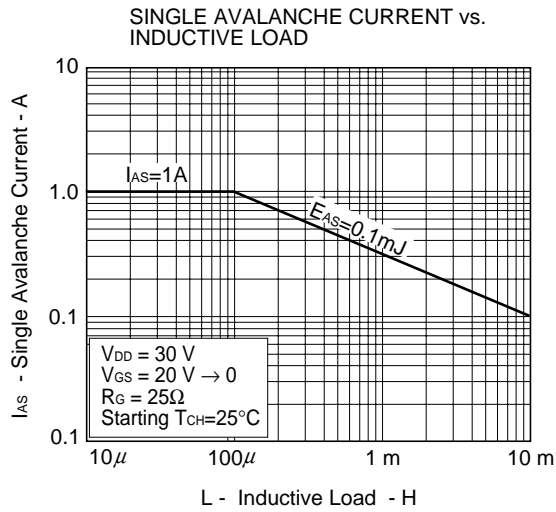


REVERSE RECOVERY TIME vs. DRAIN CURRENT



DYNAMIC INPUT/OUTPUT CHARACTERISTICS





REFERENCE

Document Name	Document No.
NEC semiconductor device reliability/quality control system	TEI-1202
Quality grade on NEC semiconductor devices	IEI-1209
Semiconductor device mounting technology manual	C10535E
Semiconductor device package manual	C10943X
Guide to quality assurance for semiconductor devices	MEI-1202
Semiconductor selection guide	X10679E
Power MOS FET features and application switching power supply	TEA-1034
Application circuits using Power MOS FET	TEA-1035
Safe operating area of Power MOS FET	TEA-1037

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Anti-radioactive design is not implemented in this product.