

MOS FIELD EFFECT TRANSISTOR

2SK2479

SWITCHING N-CHANNEL POWER MOS FET INDUSTRIAL USE

DESCRIPTION

The 2SK2479 is N-Channel MOS Field Effect Transistor designed for high voltage switching applications.

FEATURES

- Low On-Resistance
 $R_{DS(on)} = 7.5 \Omega$ ($V_{GS} = 10 \text{ V}$, $I_D = 2.0 \text{ A}$)
- Low C_{iss} $C_{iss} = 485 \text{ pF TYP.}$
- High Avalanche Capability Ratings

ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$)

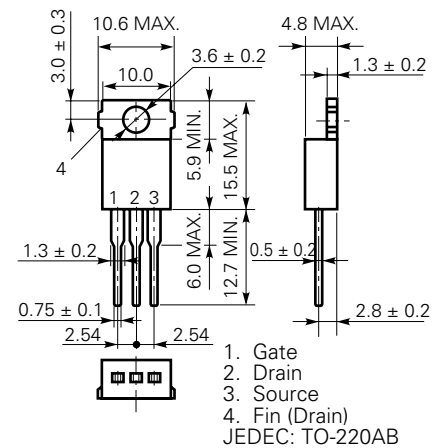
Drain to Source Voltage	V_{DSS}	900	V
Gate to Source Voltage	V_{GSS}	± 30	V
Drain Current (DC)	$I_{D(DC)}$	± 3.0	A
Drain Current (pulse)*	$I_{D(pulse)}$	± 8.0	A
Total Power Dissipation ($T_c = 25^\circ\text{C}$)	P_{T1}	70	W
Total Power Dissipation ($T_A = 25^\circ\text{C}$)	P_{T2}	1.5	W
Channel Temperature	T_{ch}	150	$^\circ\text{C}$
Storage Temperature	T_{stg}	-55 to +150	$^\circ\text{C}$
Single Avalanche Current**	I_{AS}	3.0	A
Single Avalanche Energy**	E_{AS}	5.4	mJ

* $PW \leq 10 \mu\text{s}$, Duty Cycle $\leq 1\%$

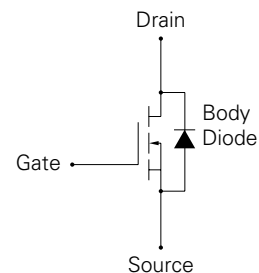
** Starting $T_{ch} = 25^\circ\text{C}$, $R_G = 25 \Omega$, $V_{GS} = 20 \text{ V} \rightarrow 0$

PACKAGE DIMENSIONS

(in millimeters)



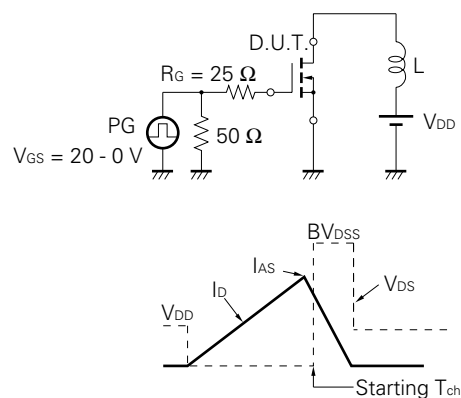
MP-25 (TO-220)



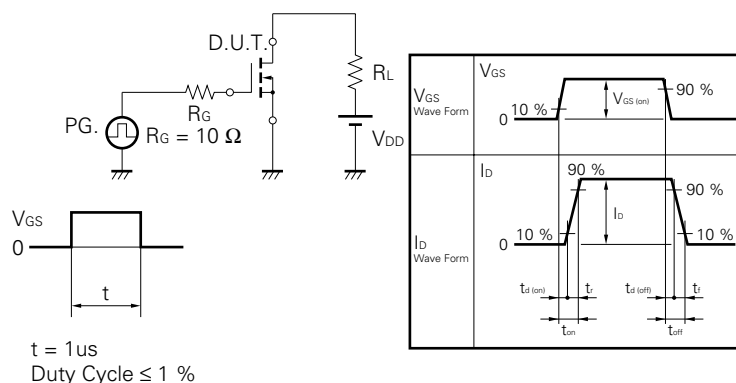
ELECTRICAL CHARACTERISTICS ($T_A = 25\text{ }^{\circ}\text{C}$)

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Drain to Source On-State Resistance	$R_{DS(on)}$		5.6	7.5	Ω	$V_{GS} = 10\text{ V}$, $I_D = 2.0\text{ A}$
Gate to Source Cutoff Voltage	$V_{GS(off)}$	2.5		3.5	V	$V_{DS} = 10\text{ V}$, $I_D = 1\text{ mA}$
Forward Transfer Admittance	$ y_{fs} $	0.8			S	$V_{DS} = 20\text{ V}$, $I_D = 2.0\text{ A}$
Drain Leakage Current	I_{DSS}			100	μA	$V_{DS} = V_{DSS}$, $V_{GS} = 0$
Gate to Source Leakage Current	I_{GSS}			± 100	nA	$V_{GS} = \pm 30\text{ V}$, $V_{DS} = 0$
Input Capacitance	C_{iss}		485		pF	$V_{DS} = 10\text{ V}$ $V_{GS} = 0$ $f = 1\text{ MHz}$
Output Capacitance	C_{oss}		75		pF	
Reverse Transfer Capacitance	C_{rss}		10		pF	
Turn-On Delay Time	$t_{d(on)}$		12		ns	$I_D = 2.0\text{ A}$ $V_{GS} = 10\text{ V}$ $V_{DD} = 150\text{ V}$ $R_G = 10\text{ }\Omega$
Rise Time	t_r		5		ns	
Turn-Off Delay Time	$t_{d(off)}$		35		ns	
Fall Time	t_f		8		ns	
Total Gate Charge	Q_G		17		nC	$I_D = 3.0\text{ A}$ $V_{DD} = 450\text{ V}$ $V_{GS} = 10\text{ V}$
Gate to Source Charge	Q_{GS}		3		nC	
Gate to Drain Charge	Q_{GD}		8		nC	
Body Diode Forward Voltage	$V_{F(S-D)}$		1.0		V	$I_F = 3.0\text{ A}$, $V_{GS} = 0$
Reverse Recovery Time	t_{rr}		670		ns	$I_F = 3.0\text{ A}$, $V_{GS} = 0$ $di/dt = 50\text{ A}/\mu\text{s}$
Reverse Recovery Charge	Q_{rr}		3.0		μC	

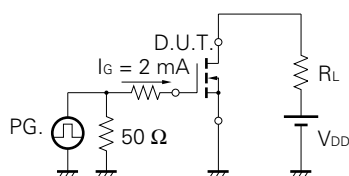
Test Circuit 1 Avalanche Capability



Test Circuit 2 Switching Time

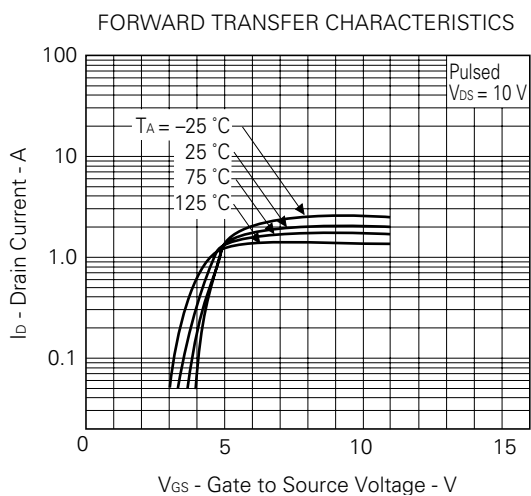
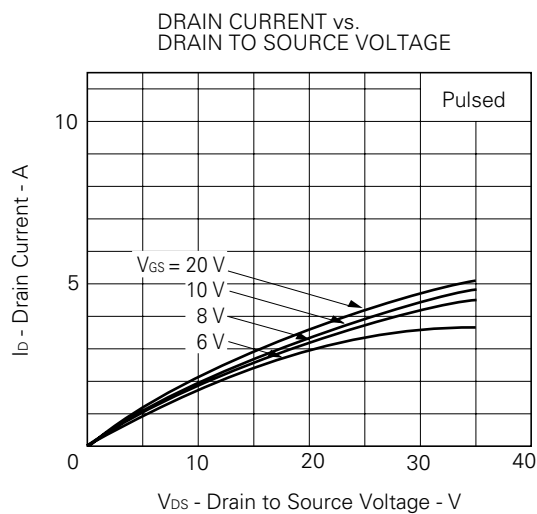
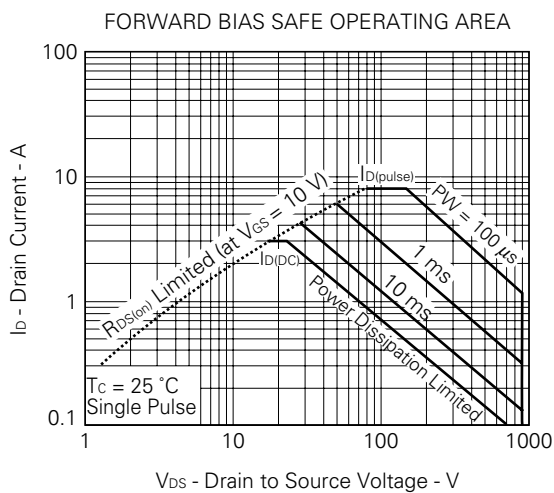
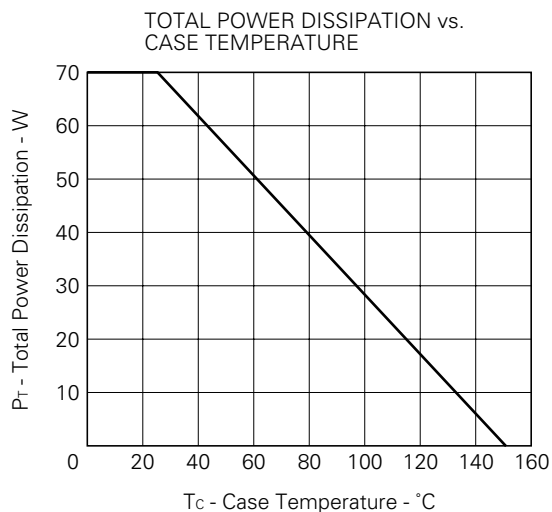
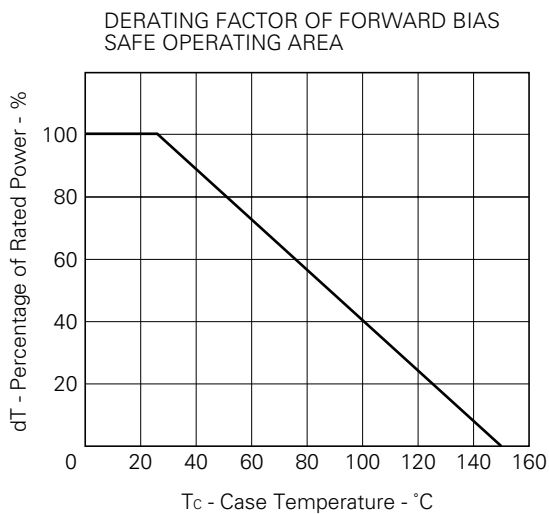


Test Circuit 3 Gate Charge

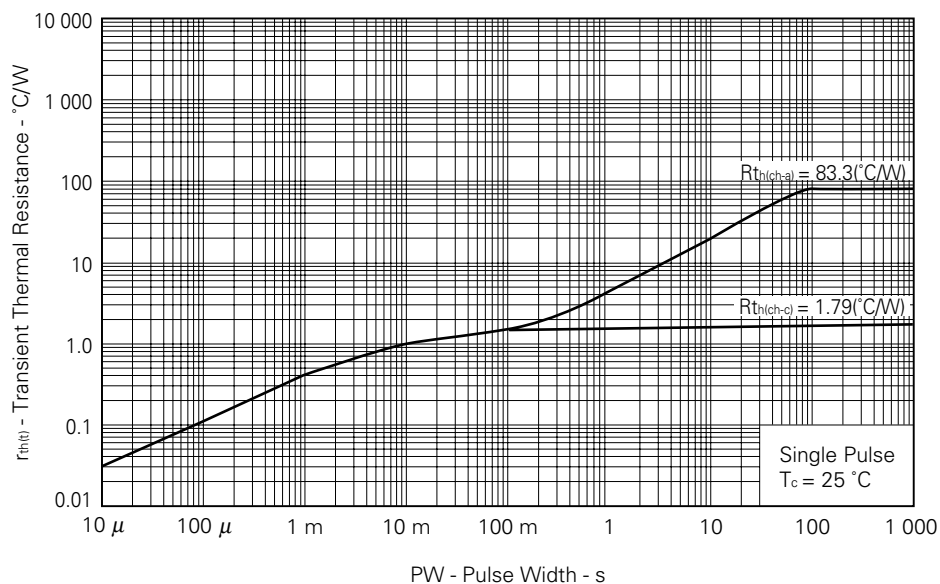


The application circuits and their parameters are for references only and are not intended for use in actual design-in's.

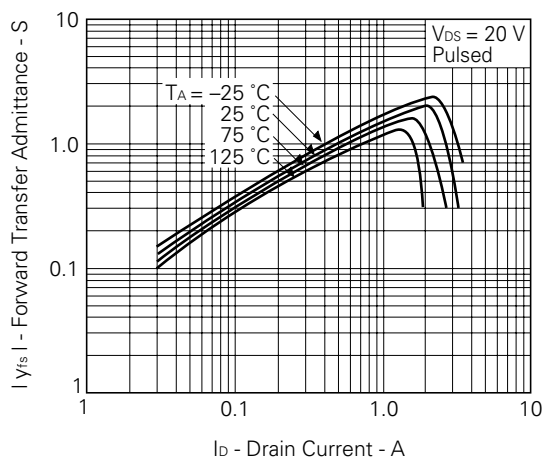
TYPICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$)



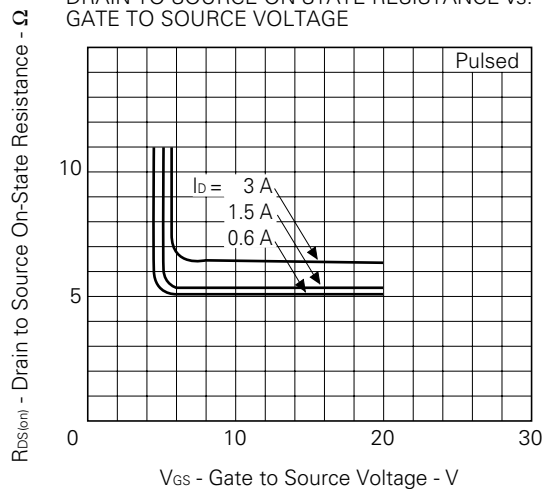
TRANSIENT THERMAL RESISTANCE vs. PULSE WIDTH



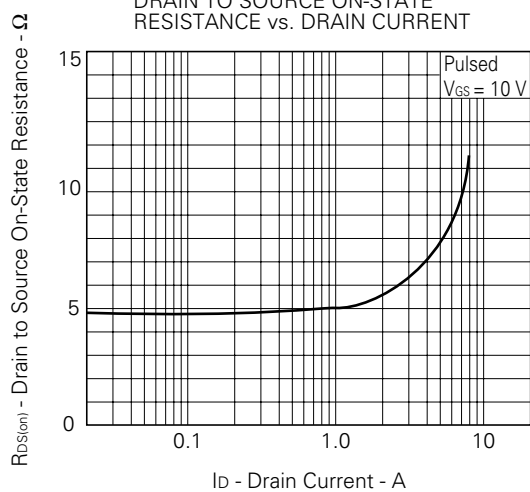
FORWARD TRANSFER ADMITTANCE vs. DRAIN CURRENT



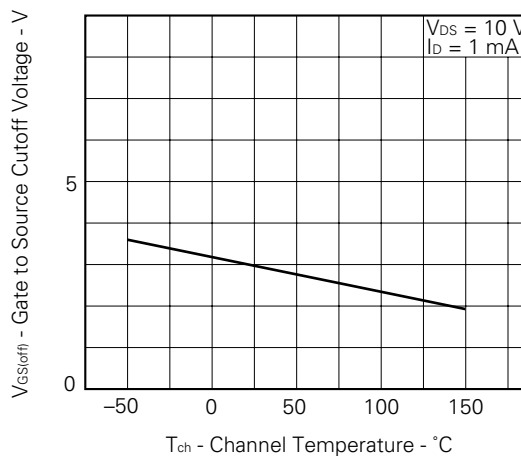
DRAIN TO SOURCE ON-STATE RESISTANCE vs. GATE TO SOURCE VOLTAGE

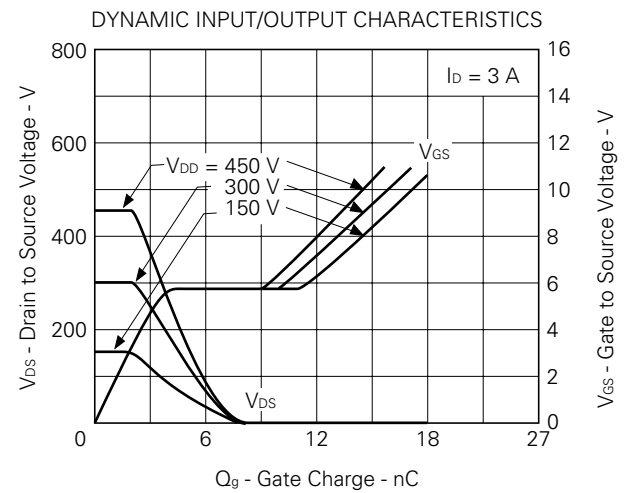
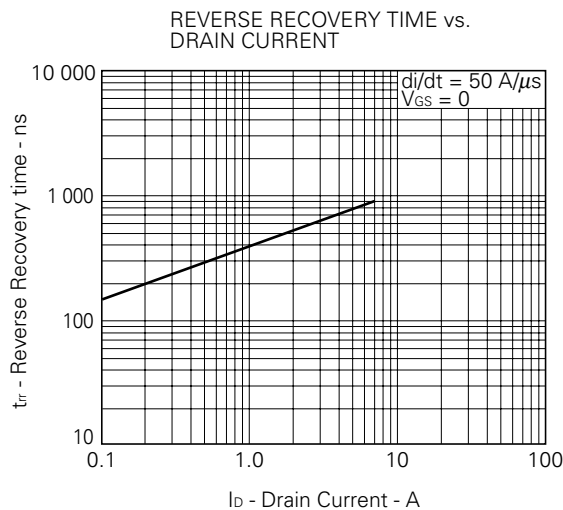
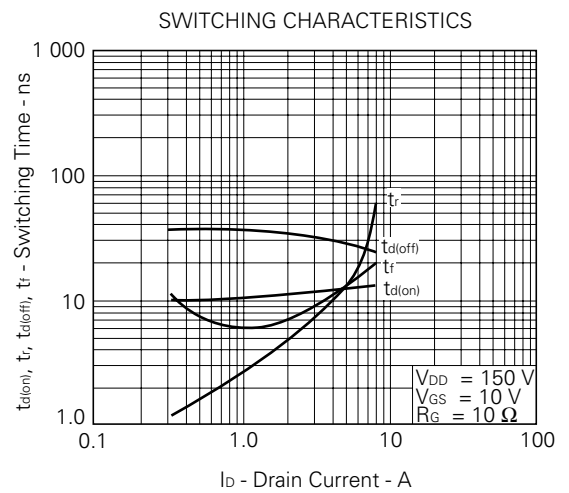
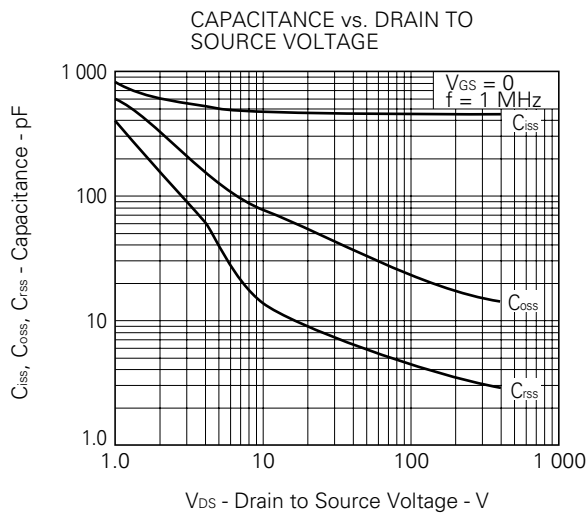
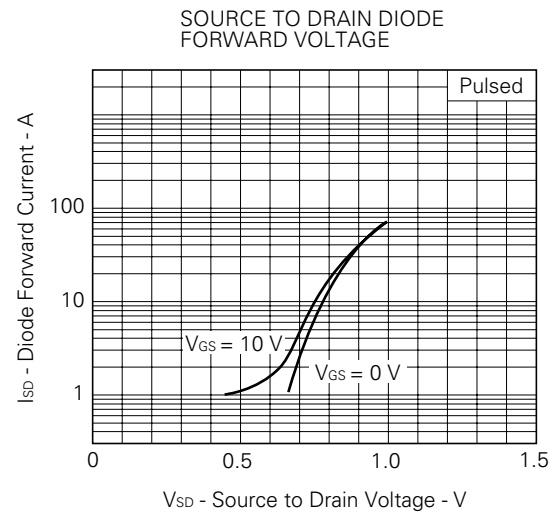
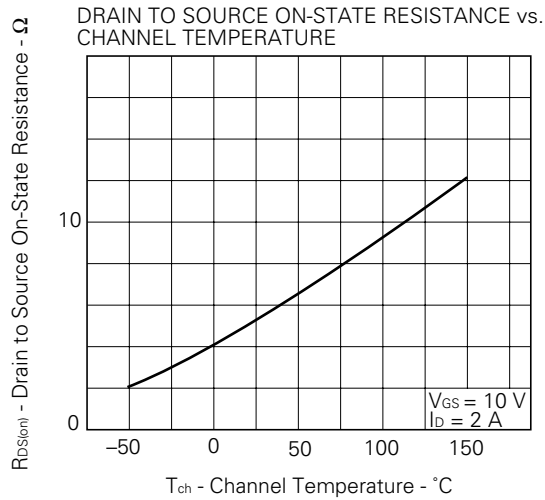


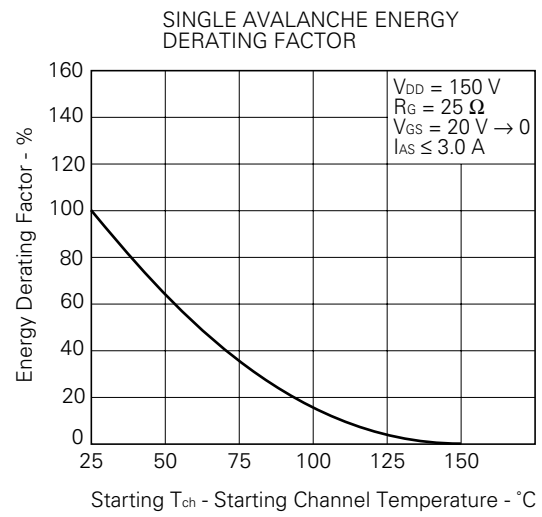
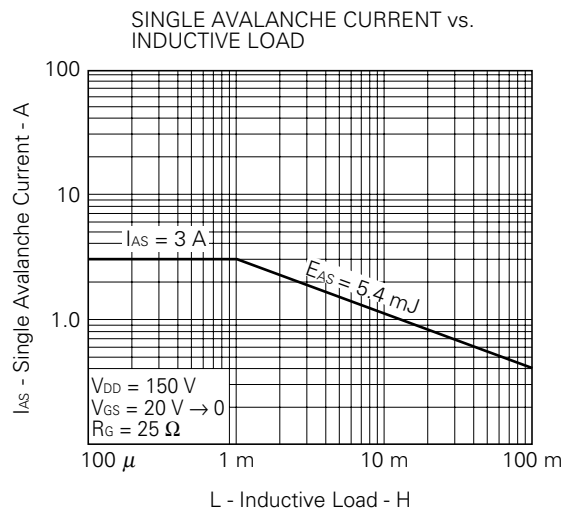
DRAIN TO SOURCE ON-STATE RESISTANCE vs. DRAIN CURRENT



GATE TO SOURCE CUTOFF VOLTAGE vs. CHANNEL TEMPERATURE







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.	IEI-1207
Semiconductor device package manual.	IEI-1213
Guide to quality assurance for semiconductor devices.	MEI-1202
Semiconductor selection guide.	MF-1134
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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