



# EMH2801

MOSFET : P-Channel Silicon MOSFET  
SBD : Schottky Barrier Diode

## General-Purpose Switching Device Applications

### Features

- Composite type with a P-Channel Silicon MOSFET and a Schottky Barrier Diode contained in one package facilitating high-density mounting
- [MOSFET]
  - Low ON-resistance
  - 1.8V drive
- [SBD]
  - Small switching noise
  - Low forward voltage ( $I_F=2.0A$ ,  $V_F \text{ max}=0.46V$ )
- Halogen free compliance

### Specifications

Absolute Maximum Ratings at  $T_a=25^\circ C$

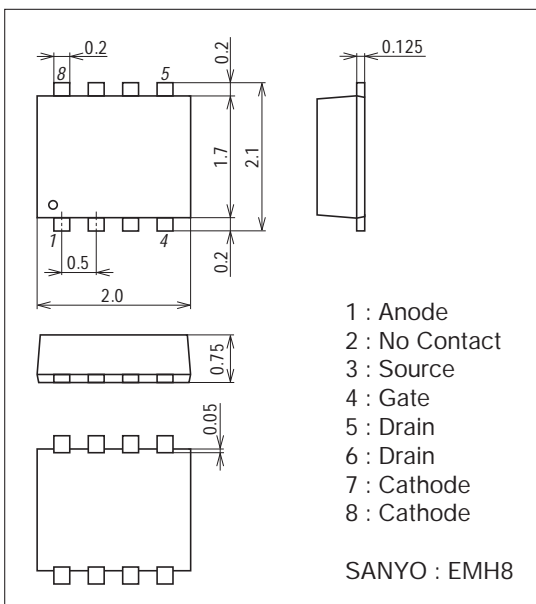
Parameter	Symbol	Conditions	Ratings	Unit
[MOSFET]				
Drain-to-Source Voltage	$V_{DSS}$		-20	V
Gate-to-Source Voltage	$V_{GSS}$		$\pm 10$	V
Drain Current (DC)	$I_D$		-3	A
Drain Current (Pulse)	$I_{DP}$	$PW \leq 10\mu s$ , duty cycle $\leq 1\%$	-20	A
Allowable Power Dissipation	$P_D$	When mounted on ceramic substrate (900mm <sup>2</sup> ×0.8mm) 1unit	1.0	W
Channel Temperature	$T_{ch}$		150	°C
Storage Temperature	$T_{stg}$		-55 to +125	°C

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### Package Dimensions

unit : mm (typ)

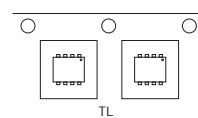
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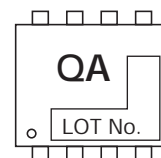
### Product & Package Information

- Package : EMH8
- JEITA, JEDEC : -
- Minimum Packing Quantity : 3,000 pcs./reel

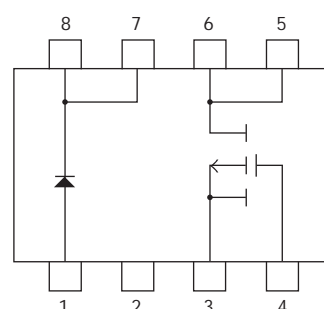
### Packing Type : TL



### Marking



### Electrical Connection



# EMH2801

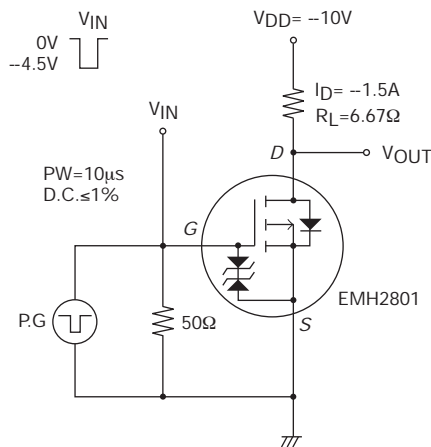
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Parameter	Symbol	Conditions	Ratings	Unit
[SBD]				
Repetitive Peak Reverse Voltage	$V_{RRM}$		15	V
Nonrepetitive Peak Reverse Surge Voltage	$V_{RSM}$		15	V
Average Output Current	$I_O$	Rectangular wave	2.0	A
Surge Forward Current	$I_{FSM}$	50Hz sine wave, 1 cycle	20	A
Junction Temperature	$T_j$		-55 to +125	°C
Storage Temperature	$T_{stg}$		-55 to +125	°C

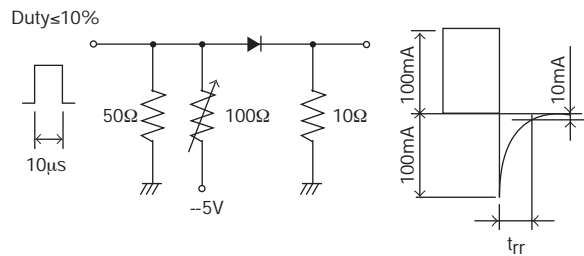
## Electrical Characteristics at $T_a=25^\circ\text{C}$

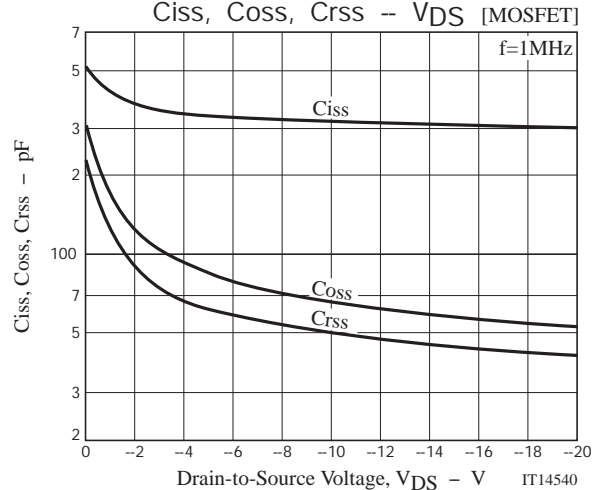
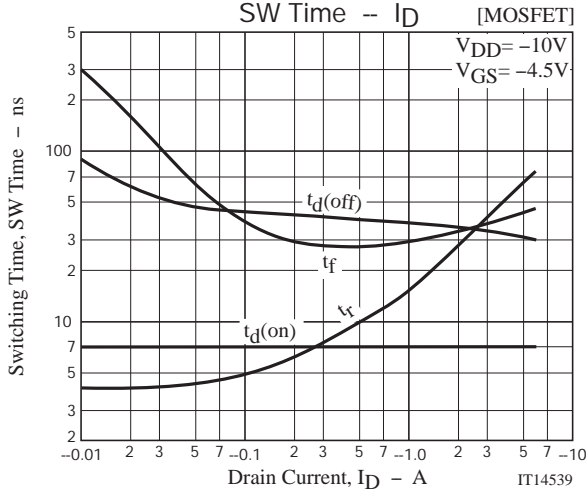
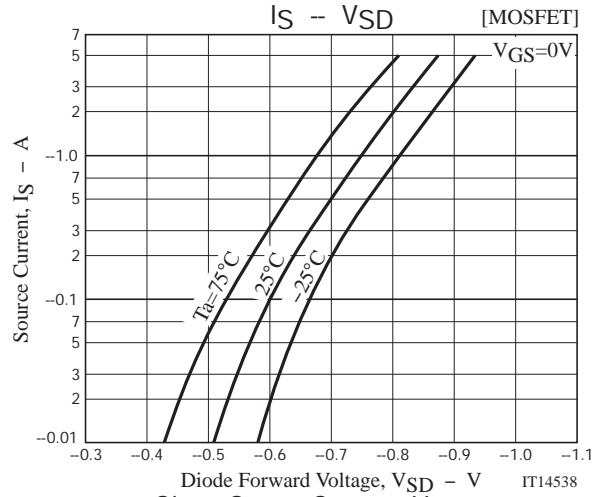
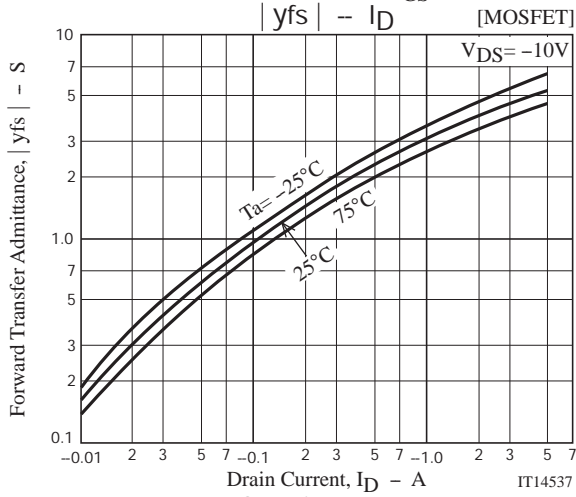
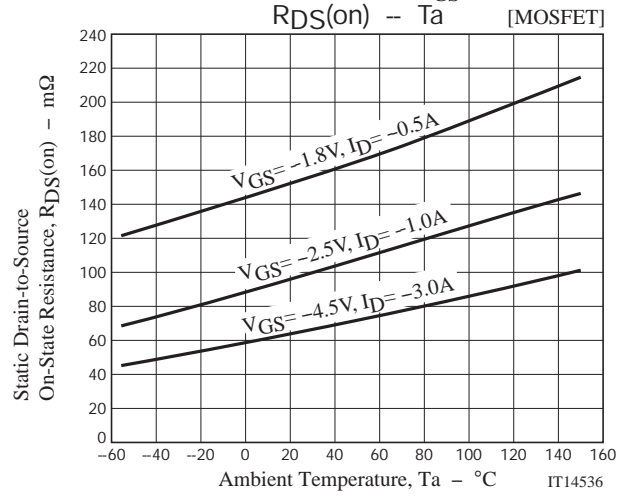
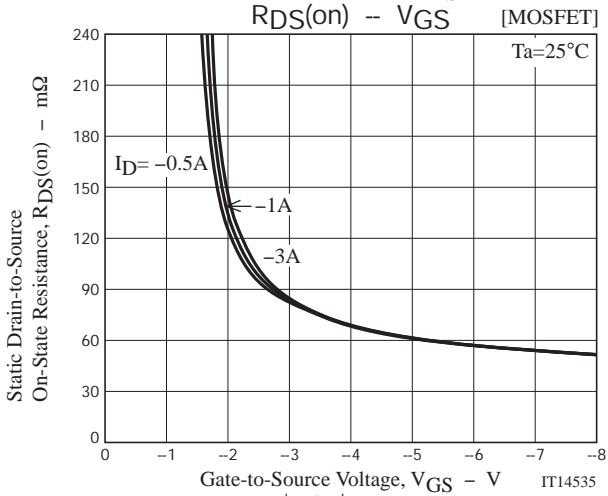
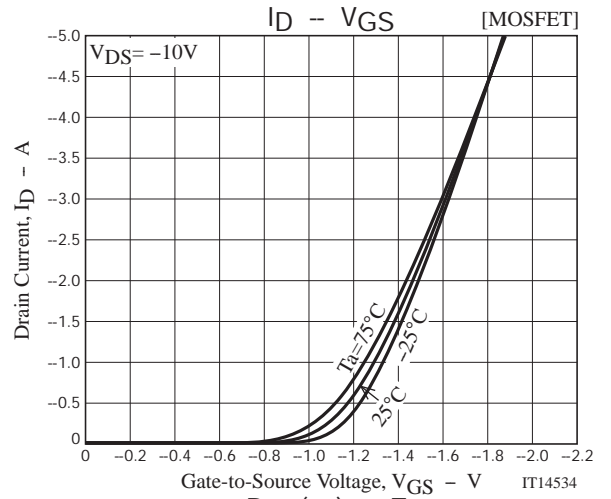
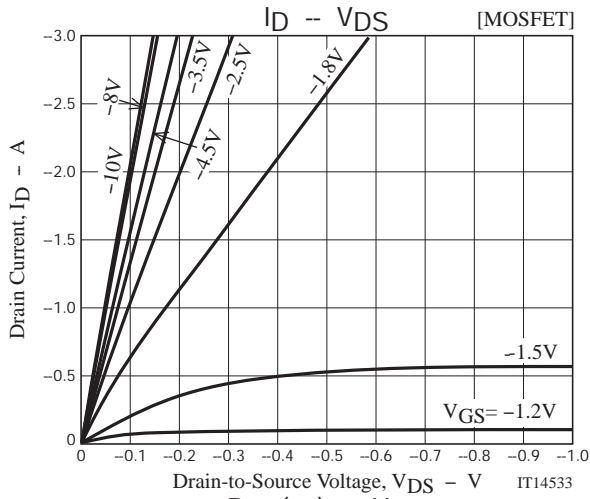
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
[MOSFET]						
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	$I_D=-1\text{mA}, V_{GS}=0\text{V}$	-20			V
Zero-Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=-20\text{V}, V_{GS}=0\text{V}$			-1	$\mu\text{A}$
Gate-to-Source Leakage Current	$I_{GSS}$	$V_{GS}=\pm 8\text{V}, V_{DS}=0\text{V}$			$\pm 10$	$\mu\text{A}$
Cutoff Voltage	$V_{GS(off)}$	$V_{DS}=-10\text{V}, I_D=-1\text{mA}$	-0.4		-1.3	V
Forward Transfer Admittance	$ y_{fs} $	$V_{DS}=-10\text{V}, I_D=-1.5\text{A}$		3.6		S
Static Drain-to-Source On-State Resistance	$R_{DS(on)1}$	$I_D=-1.5\text{A}, V_{GS}=-4.5\text{V}$		65	85	$\text{m}\Omega$
	$R_{DS(on)2}$	$I_D=-1\text{A}, V_{GS}=-2.5\text{V}$		98	137	$\text{m}\Omega$
	$R_{DS(on)3}$	$I_D=-0.5\text{A}, V_{GS}=-1.8\text{V}$		155	235	$\text{m}\Omega$
Input Capacitance	$C_{iss}$	$V_{DS}=-10\text{V}, f=1\text{MHz}$		320		pF
Output Capacitance	$C_{oss}$	$V_{DS}=-10\text{V}, f=1\text{MHz}$		66		pF
Reverse Transfer Capacitance	$C_{rss}$	$V_{DS}=-10\text{V}, f=1\text{MHz}$		50		pF
Turn-ON Delay Time	$t_{d(on)}$	See specified Test Circuit.		7.1		ns
Rise Time	$t_r$	See specified Test Circuit.		21		ns
Turn-OFF Delay Time	$t_{d(off)}$	See specified Test Circuit.		37		ns
Fall Time	$t_f$	See specified Test Circuit.		32		ns
Total Gate Charge	$Q_g$	$V_{DS}=-10\text{V}, V_{GS}=-4.5\text{V}, I_D=-3\text{A}$		4.0		nC
Gate-to-Source Charge	$Q_{gs}$	$V_{DS}=-10\text{V}, V_{GS}=-4.5\text{V}, I_D=-3\text{A}$		0.6		nC
Gate-to-Drain "Miller" Charge	$Q_{gd}$	$V_{DS}=-10\text{V}, V_{GS}=-4.5\text{V}, I_D=-3\text{A}$		1.1		nC
Diode Forward Voltage	$V_{SD}$	$I_S=-3\text{A}, V_{GS}=0\text{V}$		-0.83	-1.2	V
[SBD]						
Reverse Voltage	$V_R$	$I_R=1\text{mA}$	15			V
Forward Voltage	$V_{F1}$	$I_F=1.0\text{A}$		0.33	0.39	V
	$V_{F2}$	$I_F=2.0\text{A}$		0.39	0.46	V
Reverse Current	$I_R$	$V_R=7.5\text{V}$			300	$\mu\text{A}$
Interterminal Capacitance	$C$	$V_R=10\text{V}, f=1\text{MHz}$		35		pF

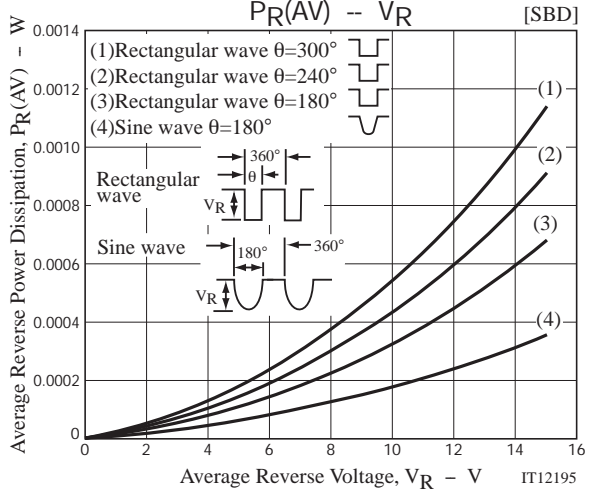
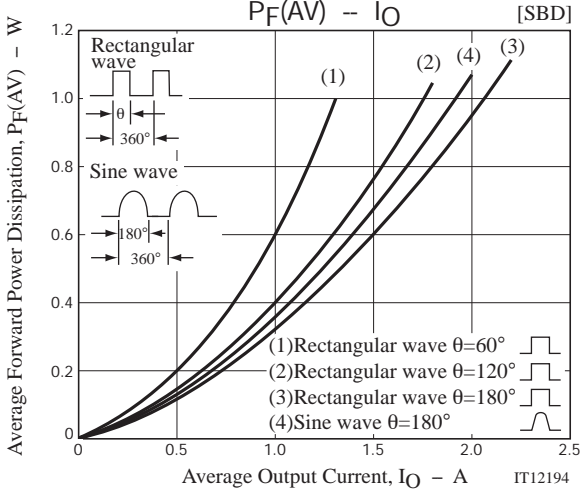
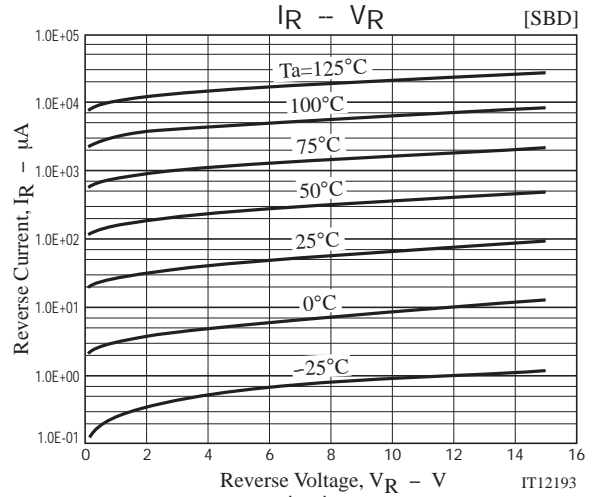
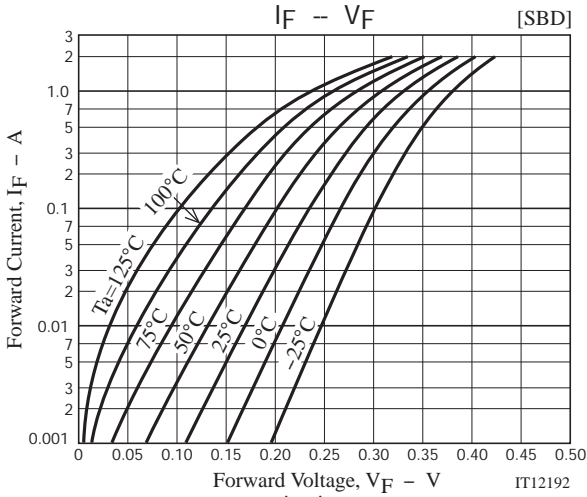
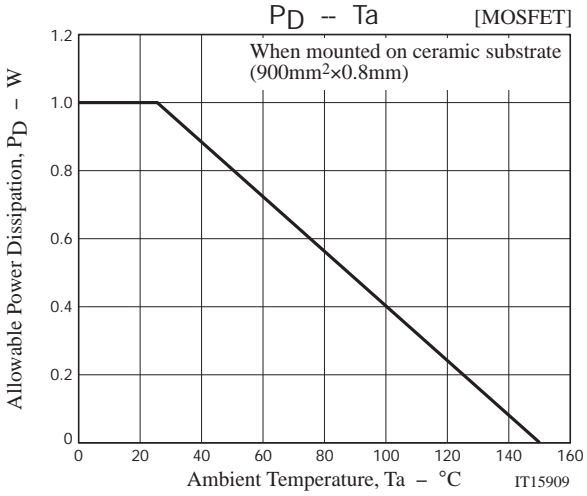
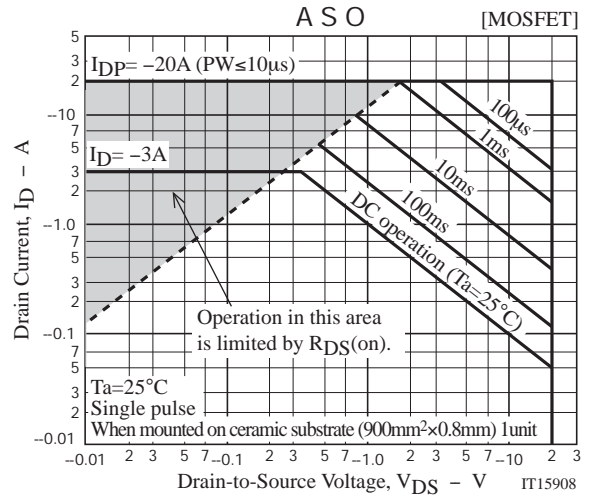
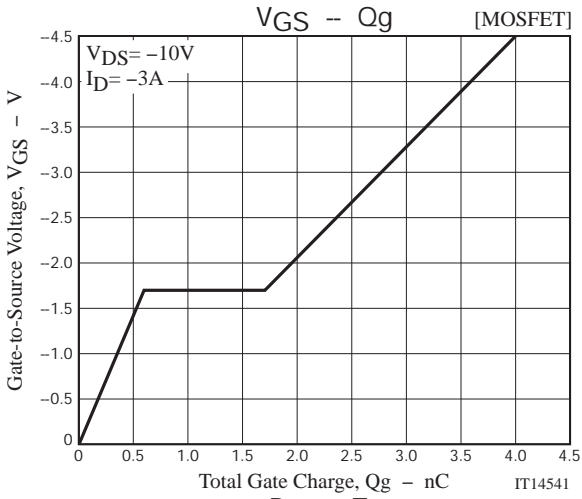
### Switching Time Test Circuit (MOSFET)

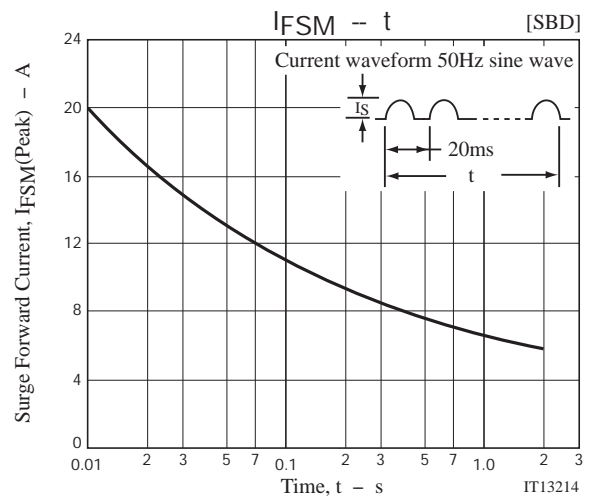
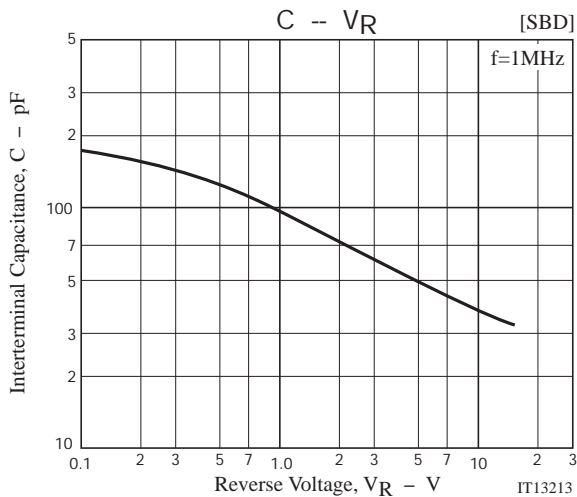


### $t_{rr}$ Test Circuit (SBD)









Note on usage : Since the EMH2801 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

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