NVC6S5A354PLZ

Power MOSFET
–60V, 100mΩ, –4A, P-Channel

ON Semiconductor®

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This Power MOSFET is produced using ON Semiconductor's trench technology, which is specifically designed to minimize gate charge and low on resistance. This device is suitable for applications with low gate charge driving or low on resistance requirements.

V_{DSS}	R_{DS}(on) Max	I_D Max
–60V	100mΩ@ –10V	–4A
	135mΩ@ –4.5V	
	145mΩ@ –4.0V	

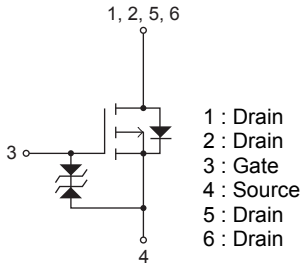
Features

- 4V drive
- High ESD protection
- Low On-Resistance
- Pb-Free, Halogen Free and RoHS compliance

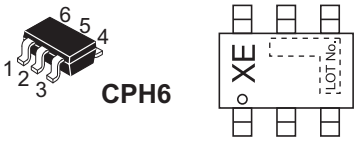
Typical Applications

- Reverse Battery Protection
- High Side Load Switch

ELECTRICAL CONNECTION
P-Channel



MARKING



CPH6

ORDERING INFORMATION

See detailed ordering and shipping information on page 6 of this data sheet.

SPECIFICATIONS

ABSOLUTE MAXIMUM RATING at Ta = 25°C (Note 1)

Parameter	Symbol	Value	Unit
Drain to Source Voltage	V_{DSS}	–60	V
Gate to Source Voltage	V_{GSS}	±20	V
Drain Current (DC) (Note 2)	I_D	–4	A
Drain Current (DC) (Note 3)		–3	A
Drain Current (Pulse) PW ≤ 10μs, duty cycle ≤ 1%	I_{DP}	–16	A
Power Dissipation Ta=25°C(Note 2)	P_D	1.9	W
Power Dissipation Ta=25°C(Note 3)		0.9	W
Junction Temperature and Storage Temperature	Tj, Tstg	–55 to +175	°C

Note 1 : Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

THERMAL RESISTANCE RATINGS

Parameter		Symbol	Value	Unit
Junction to Ambient	(Note 2)	$R_{\theta JA}$	78.1	°C/W
	(Note 3)		160	°C/W

Note 2 : Surface mounted on ceramic substrate(1500mm^2 × 0.8mm).

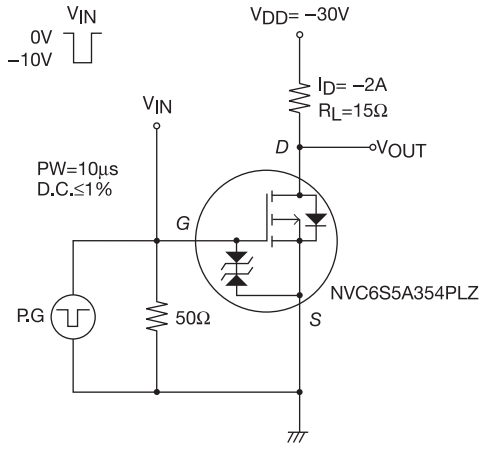
Note 3 : Surface mounted on FR4 board using a 92mm^2, 1 oz. Cu pad.

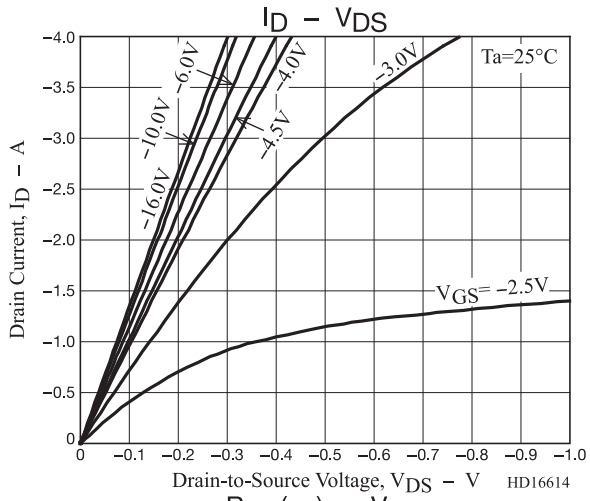
ELECTRICAL CHARACTERISTICS at Ta = 25°C (Note 4)

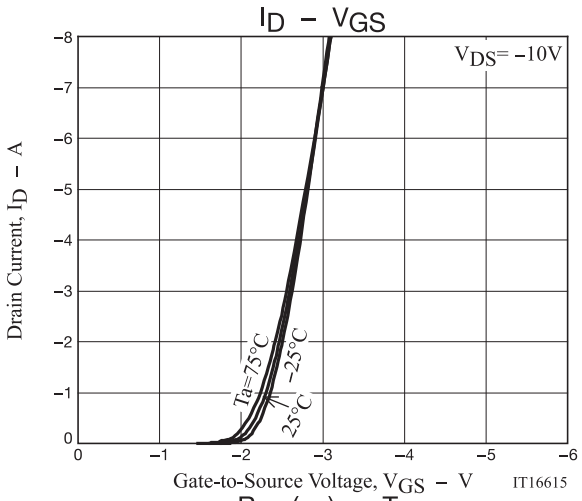
Parameter	Symbol	Conditions	Value			Unit
			min	typ	max	
Drain to Source Breakdown Voltage	$V_{(BR)DSS}$	I_D=−1mA, V_{GS}=0V	−60			V
Zero-Gate Voltage Drain Current	I_{DSS}	V_{DS}=−60V, V_{GS}=0V			−1	μA
Gate to Source Leakage Current	I_{GSS}	V_{GS}=±16V, V_{DS}=0V			±10	μA
Gate Threshold Voltage	V_{GS}(th)	V_{DS}=−10V, I_D=−1mA	−1.2		−2.6	V
Forward Transconductance	g_{FS}	V_{DS}=−10V, I_D=−2A		4.8		S
Static Drain to Source On-State Resistance	R_{DS}(on)	I_D=−2A, V_{GS}=−10V		77	100	mΩ
		I_D=−1A, V_{GS}=−4.5V		96	135	mΩ
		I_D=−1A, V_{GS}=−4V		103	145	mΩ
Input Capacitance	Ciss	V_{DS}=−20V, f=1MHz		600		pF
Output Capacitance	Coss			60		pF
Reverse Transfer Capacitance	Crss			50		pF
Turn-ON Delay Time	t_d(on)	See Fig.1		5.8		ns
Rise Time	t_r			12		ns
Turn-OFF Delay Time	t_d(off)			78		ns
Fall Time	t_f			40		ns
Total Gate Charge	Qg	V_{DS}=−30V, V_{GS}=−10V, I_D=−4A		14		nC
Gate to Source Charge	Qgs			1.6		nC
Gate to Drain “Miller” Charge	Qgd			3.4		nC
Forward Diode Voltage	V_{SD}	I_S=−4A, V_{GS}=0V		−0.84	−1.2	V

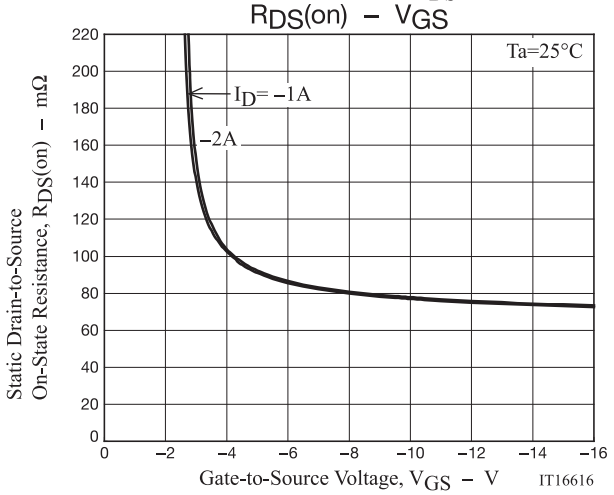
Note 4 : Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

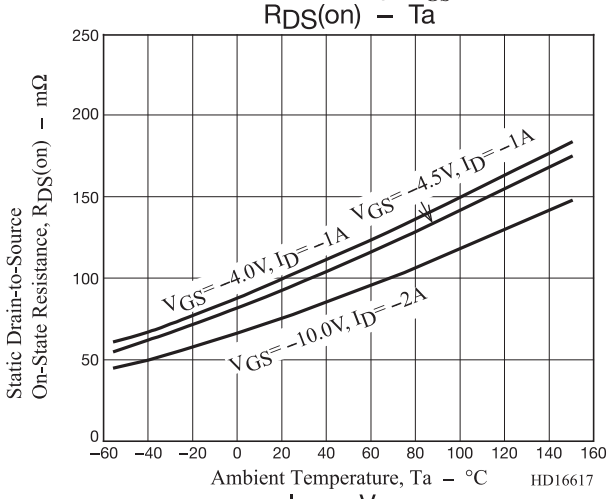
Fig.1 Switching Time Test Circuit

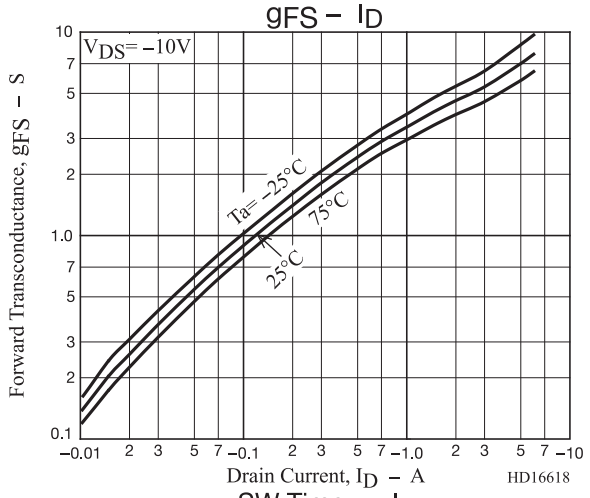


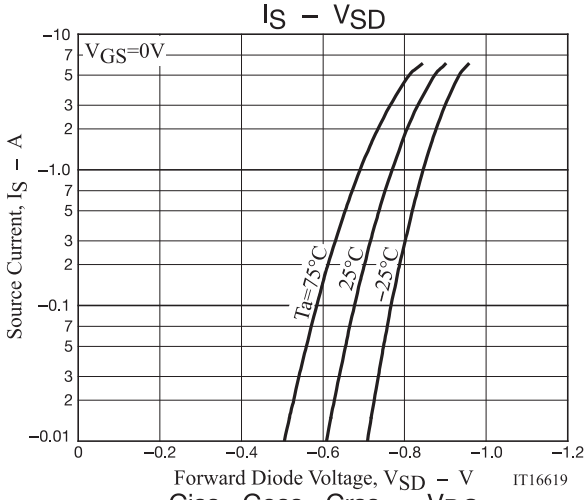

ID – VDS
Ta=25°C
–3.0V
–4.0V
–4.5V
–6.0V
–10.0V
–16.0V
VGS= –2.5V
Drain Current, ID – A
Drain-to-Source Voltage, VDS – V
HD16614

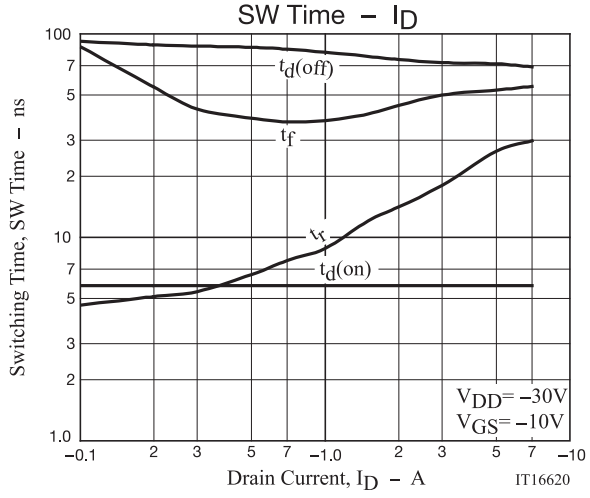

ID – VGS
VDS= –10V
Ta=75°C
–25°C
25°C
Drain Current, ID – A
Gate-to-Source Voltage, VGS – V
IT16615

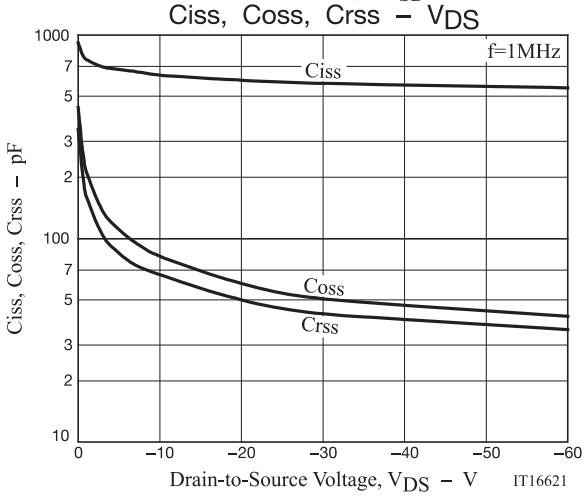

RDS(on) – VGS
Ta=25°C
ID= –1A
–2A
Static Drain-to-Source On-State Resistance, RDS(on) – mΩ
Gate-to-Source Voltage, VGS – V
IT16616

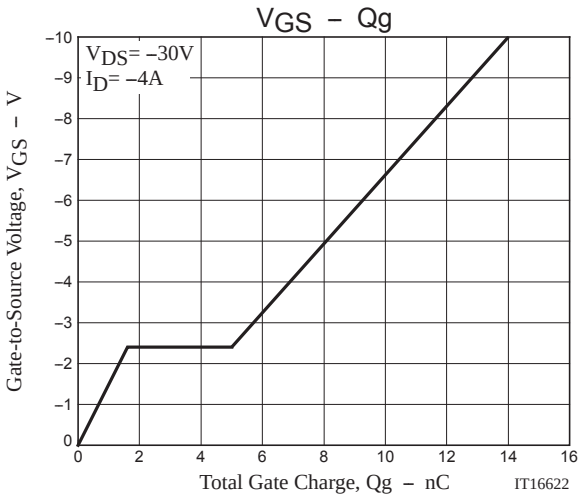

RDS(on) – Ta
VGS= –4.5V, ID= –1A
VGS= –4.0V, ID= –1A
VGS= –10.0V, ID= –2A
Static Drain-to-Source On-State Resistance, RDS(on) – mΩ
Ambient Temperature, Ta – °C
HD16617

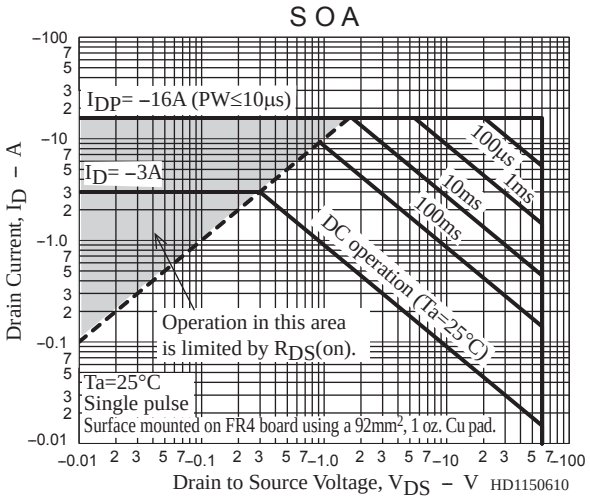

gFS – ID
VDS= –10V
Ta= –25°C
75°C
25°C
Forward Transconductance, gFS – S
Drain Current, ID – A
HD16618

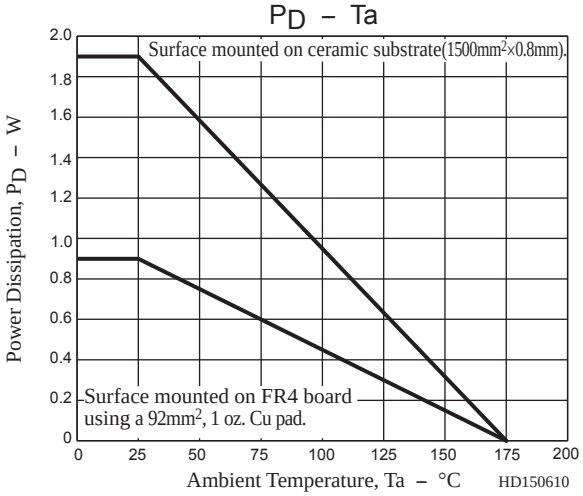

IS – VSD
VGS=0V
Ta=75°C
25°C
–25°C
Source Current, IS – A
Forward Diode Voltage, VSD – V
IT16619

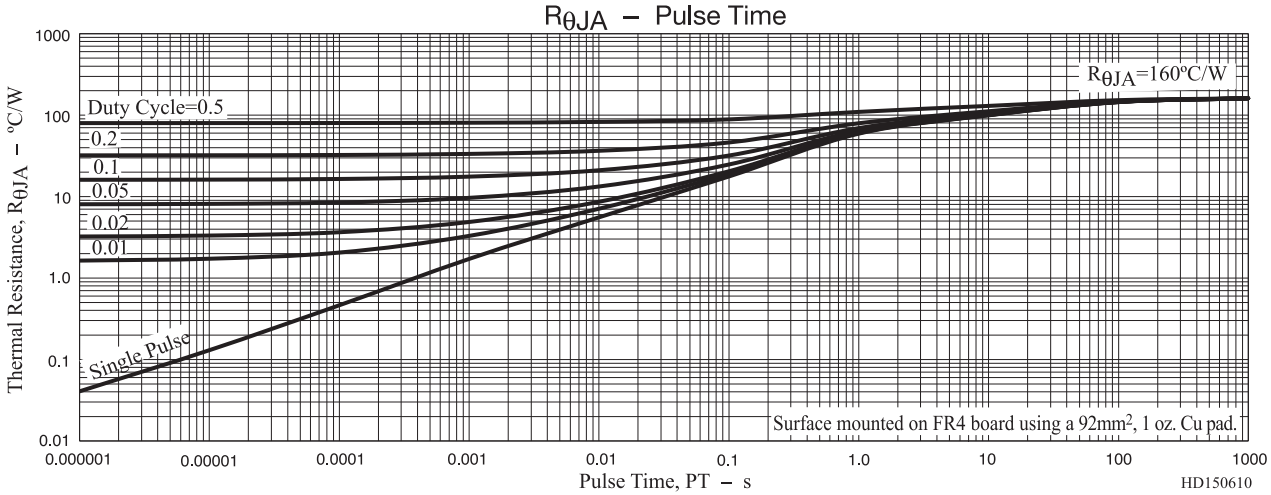

SW Time – ID
td(off)
tf
tr
td(on)
VDD= –30V
VGS= –10V
Switching Time, SW Time – ns
Drain Current, ID – A
IT16620


Ciss, Coss, Crss – VDS
f=1MHz
Ciss
Coss
Crss
Ciss, Coss, Crss – pF
Drain-to-Source Voltage, VDS – V
IT16621


VGS – Qg
VDS= –30V
ID= –4A
Gate-to-Source Voltage, VGS – V
Total Gate Charge, Qg – nC
IT16622

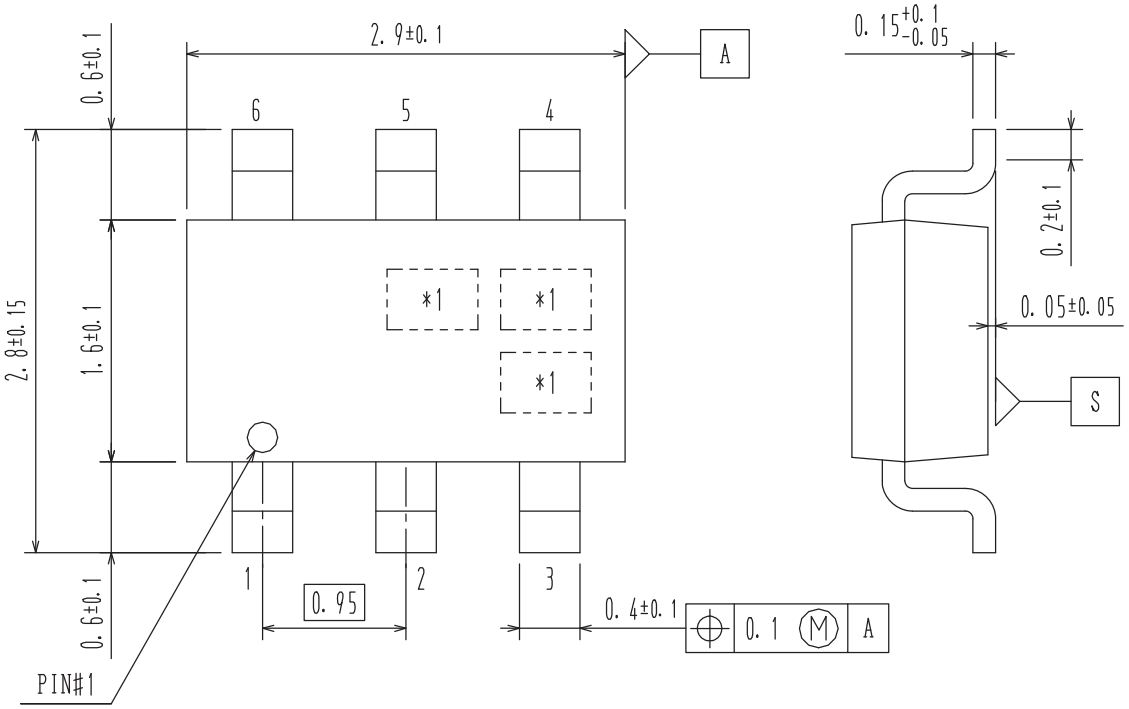

S O A
IDP= –16A (PW≤10μs)
ID= –3A
100μs
1ms
10ms
100ms
DC operation (Ta=25°C)
Operation in this area
is limited by RDS(on).
Ta=25°C
Single pulse
Surface mounted on FR4 board using a 92mm², 1 oz. Cu pad.
Drain Current, ID – A
Drain to Source Voltage, VDS – V
HD1150610


PD – Ta
Surface mounted on ceramic substrate(1500mm²×0.8mm).
Surface mounted on FR4 board
using a 92mm², 1 oz. Cu pad.
Power Dissipation, PD – W
Ambient Temperature, Ta – °C
HD150610

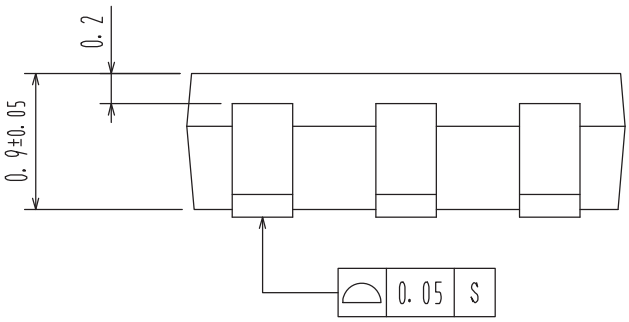

RθJA – Pulse Time
RθJA=160°C/W
Duty Cycle=0.5
0.2
0.1
0.05
0.02
0.01
Single Pulse
Surface mounted on FR4 board using a 92mm², 1 oz. Cu pad.
Thermal Resistance, RθJA – °C/W
Pulse Time, PT – s
HD150610

PACKAGE DIMENSIONS
unit : mm

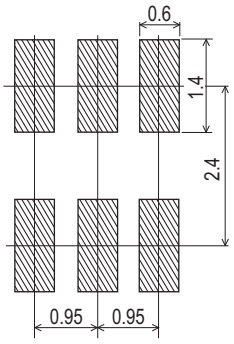
CPH6
CASE 318BD
ISSUE O



*1:Lot indication



Recommended Soldering Footprint



1 : Drain
2 : Drain
3 : Gate
4 : Source
5 : Drain
6 : Drain

ORDERING INFORMATION

Device	Marking	Package	Shipping (Qty / Packing)
NVC6S5A354PLZT1G	XE	CPH6 (Pb-Free / Halogen Free)	3,000 / Tape & Reel

† For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D. http://www.onsemi.com/pub_link/Collateral/BRD8011-D.PDF

Note on usage : Since the NVC6S5A354PLZ is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

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