

# NVC6S5A354PLZ

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



ON Semiconductor®

[www.onsemi.com](http://www.onsemi.com)

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.

### 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

### SPECIFICATIONS

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

Parameter	Symbol	Value	Unit
Drain to Source Voltage	V <sub>DSS</sub>	-60	V
Gate to Source Voltage	V <sub>GSS</sub>	±20	V
Drain Current (DC) (Note 2)	I <sub>D</sub>	-4	A
Drain Current (DC) (Note 3)		-3	A
Drain Current (Pulse) PW ≤ 10µs, duty cycle ≤ 1%	I <sub>DP</sub>	-16	A
Power Dissipation Ta=25°C (Note 2)	P <sub>D</sub>	1.9	W
Power Dissipation Ta=25°C (Note 3)		0.9	W
Junction Temperature and Storage Temperature	T <sub>j</sub> , T <sub>stg</sub>	-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

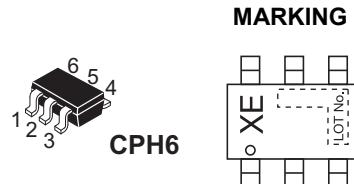
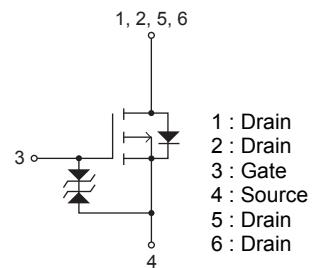
Parameter	Symbol	Value	Unit
Junction to Ambient	R <sub>θJA</sub>	78.1	°C/W
		160	°C/W

Note 2 : Surface mounted on ceramic substrate(1500mm<sup>2</sup> × 0.8mm).

Note 3 : Surface mounted on FR4 board using a 92mm<sup>2</sup>, 1 oz. Cu pad.

V <sub>DSS</sub>	R <sub>D(on)</sub> Max	I <sub>D</sub> Max
-60V	100mΩ@ -10V	
	135mΩ@ -4.5V	
	145mΩ@ -4.0V	-4A

### ELECTRICAL CONNECTION P-Channel



### ORDERING INFORMATION

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

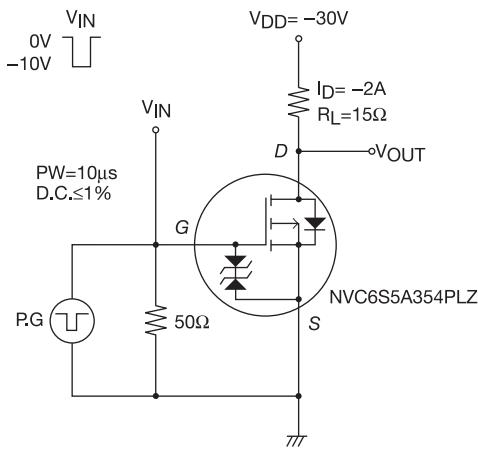
# NVC6S5A354PLZ

## ELECTRICAL CHARACTERISTICS at $T_a = 25^\circ\text{C}$ (Note 4)

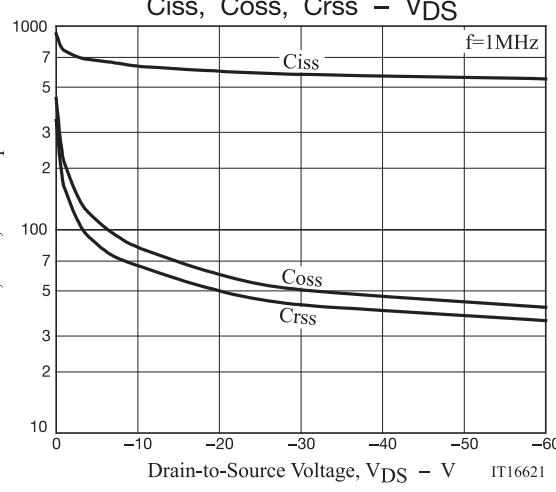
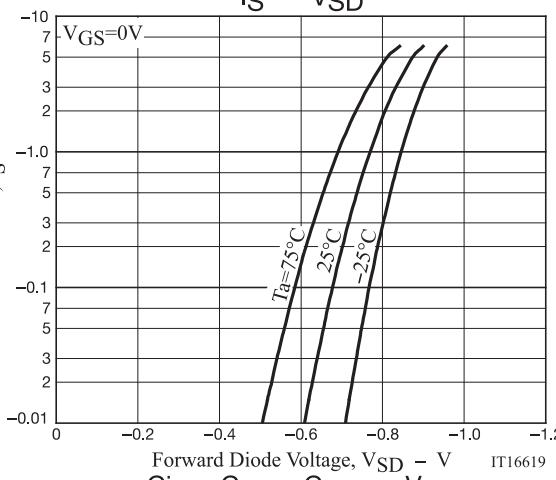
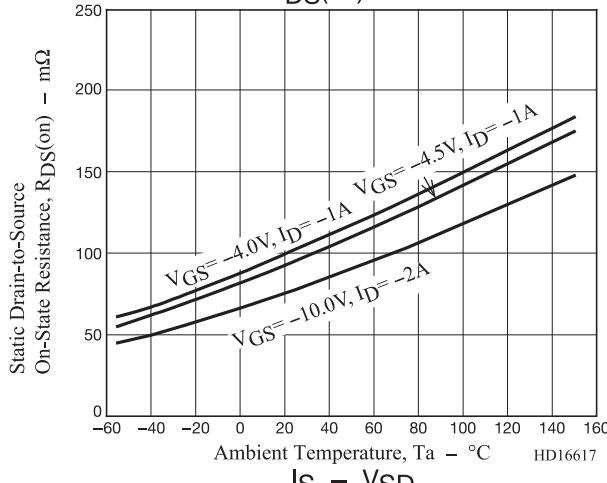
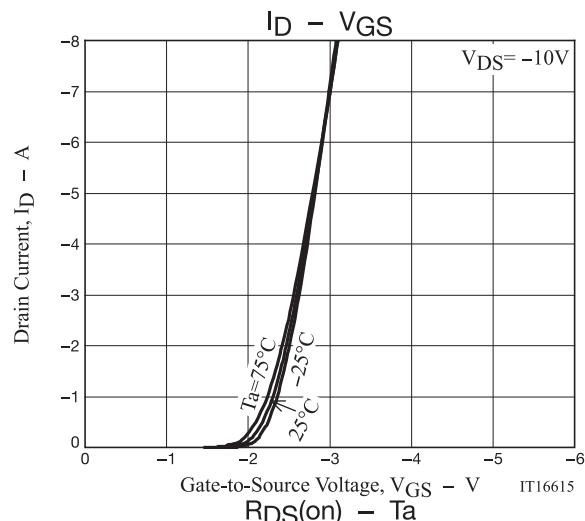
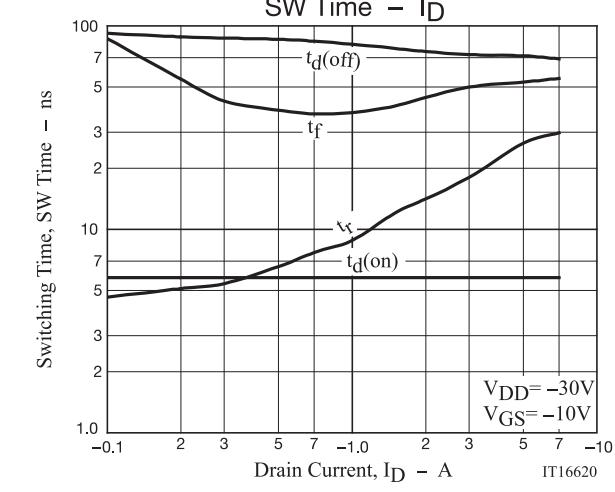
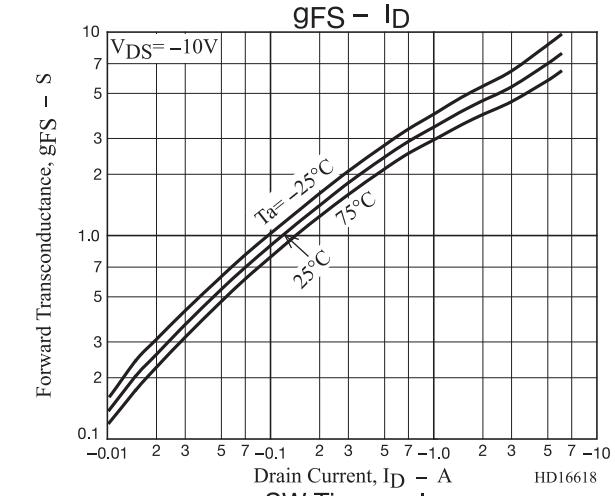
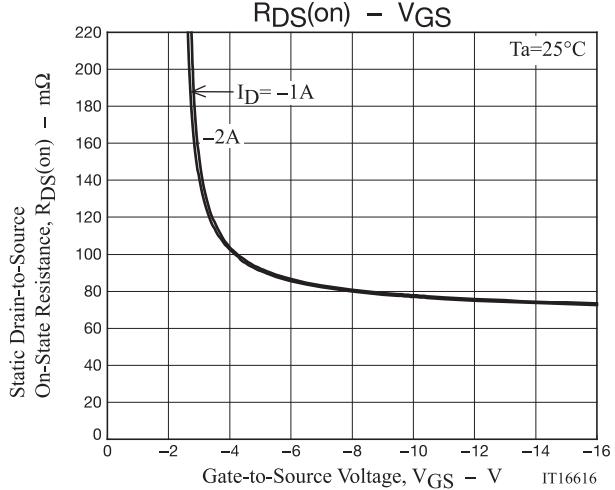
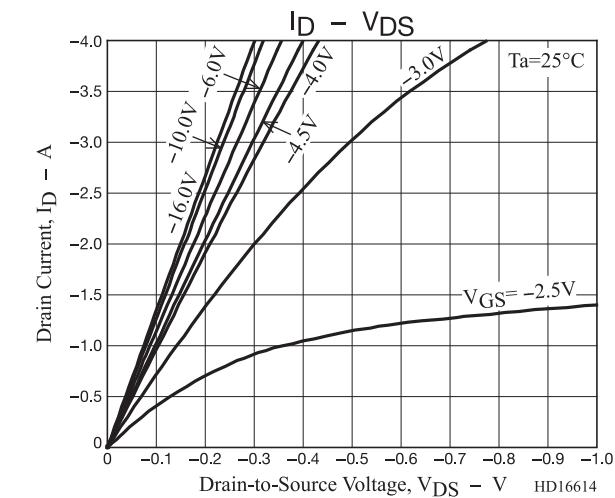
Parameter	Symbol	Conditions	Value			Unit
			min	typ	max	
Drain to Source Breakdown Voltage	$V(\text{BR})_{\text{DSS}}$	$I_D = -1\text{mA}, V_{GS} = 0\text{V}$	-60			V
Zero-Gate Voltage Drain Current	$I_{\text{DSS}}$	$V_{DS} = -60\text{V}, V_{GS} = 0\text{V}$			-1	$\mu\text{A}$
Gate to Source Leakage Current	$I_{\text{GSS}}$	$V_{GS} = \pm 16\text{V}, V_{DS} = 0\text{V}$			$\pm 10$	$\mu\text{A}$
Gate Threshold Voltage	$V_{GS(\text{th})}$	$V_{DS} = -10\text{V}, I_D = -1\text{mA}$	-1.2		-2.6	V
Forward Transconductance	$g_{\text{FS}}$	$V_{DS} = -10\text{V}, I_D = -2\text{A}$		4.8		S
Static Drain to Source On-State Resistance	$R_{\text{DS(on)}}$	$I_D = -2\text{A}, V_{GS} = -10\text{V}$		77	100	$\text{m}\Omega$
		$I_D = -1\text{A}, V_{GS} = -4.5\text{V}$		96	135	$\text{m}\Omega$
		$I_D = -1\text{A}, V_{GS} = -4\text{V}$		103	145	$\text{m}\Omega$
Input Capacitance	$C_{\text{iss}}$	$V_{DS} = -20\text{V}, f = 1\text{MHz}$		600		$\text{pF}$
Output Capacitance	$C_{\text{oss}}$			60		$\text{pF}$
Reverse Transfer Capacitance	$C_{\text{rss}}$			50		$\text{pF}$
Turn-ON Delay Time	$t_{\text{q(on)}}$	See Fig.1		5.8		ns
Rise Time	$t_r$			12		ns
Turn-OFF Delay Time	$t_{\text{q(off)}}$			78		ns
Fall Time	$t_f$			40		ns
Total Gate Charge	$Q_g$	$V_{DS} = -30\text{V}, V_{GS} = -10\text{V}, I_D = -4\text{A}$		14		$\text{nC}$
Gate to Source Charge	$Q_{gs}$			1.6		$\text{nC}$
Gate to Drain "Miller" Charge	$Q_{gd}$			3.4		$\text{nC}$
Forward Diode Voltage	$V_{SD}$	$I_S = -4\text{A}, V_{GS} = 0\text{V}$		-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.

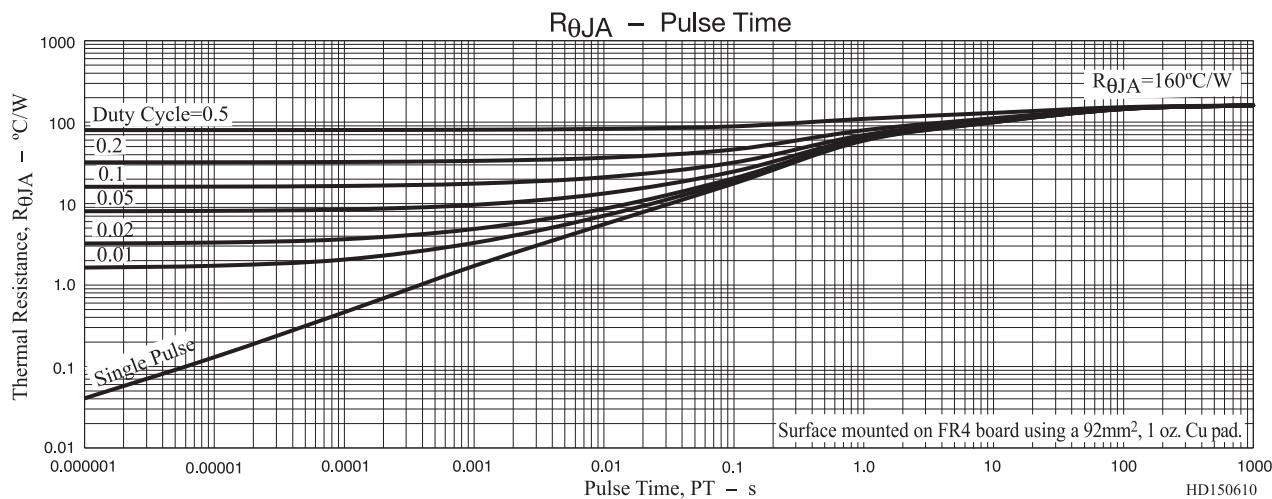
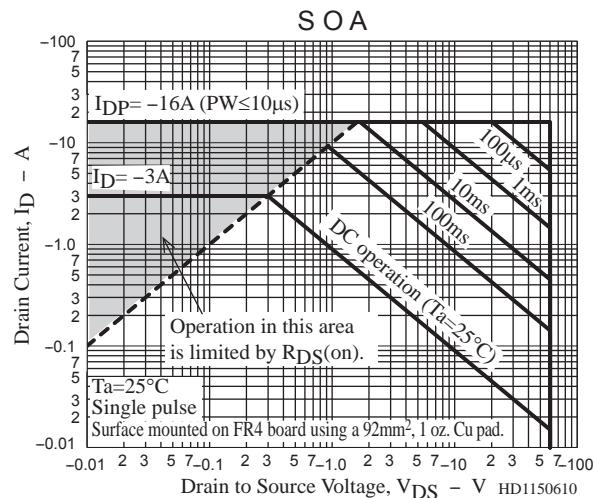
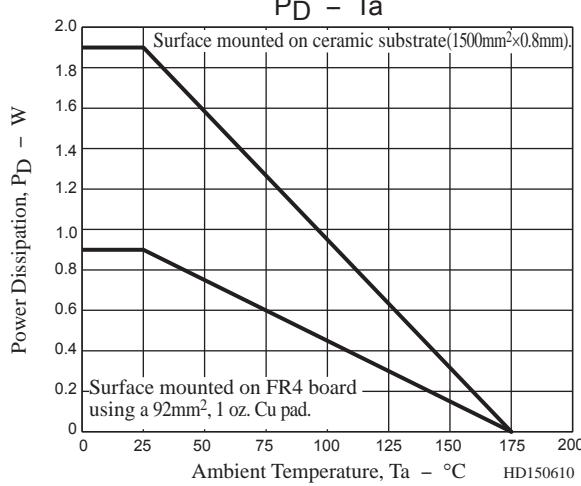
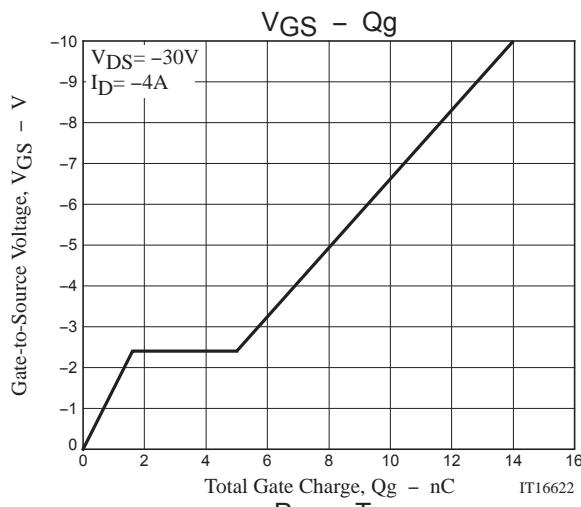
**Fig.1 Switching Time Test Circuit**



# NVC6S5A354PLZ



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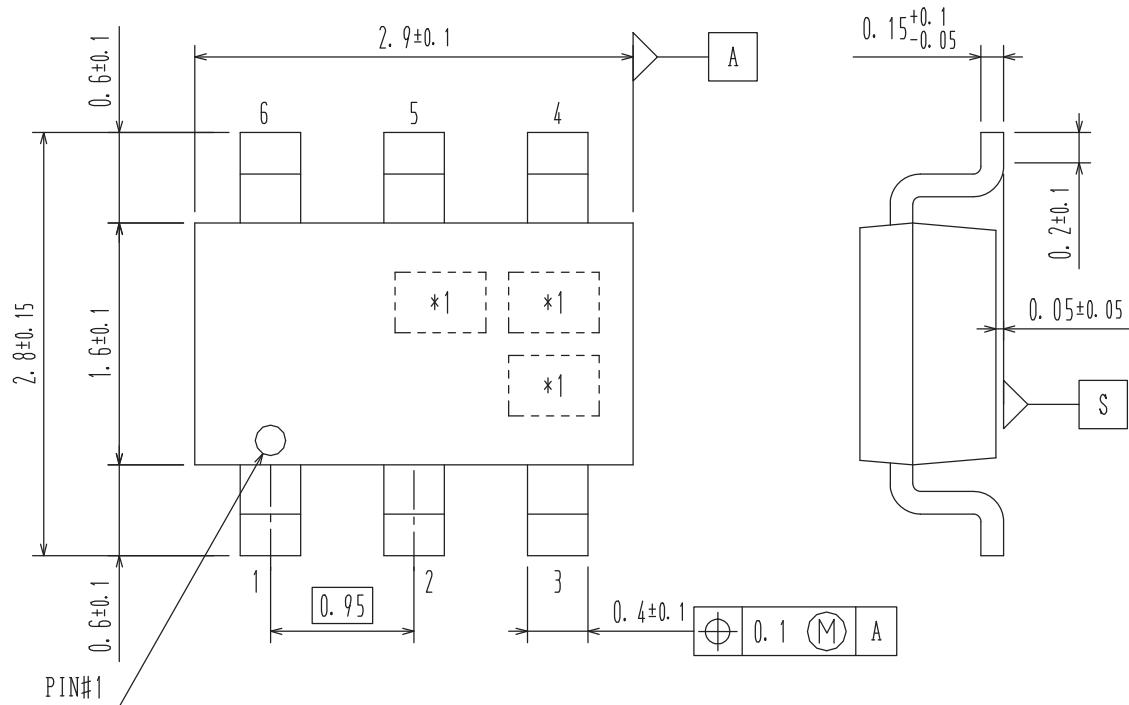


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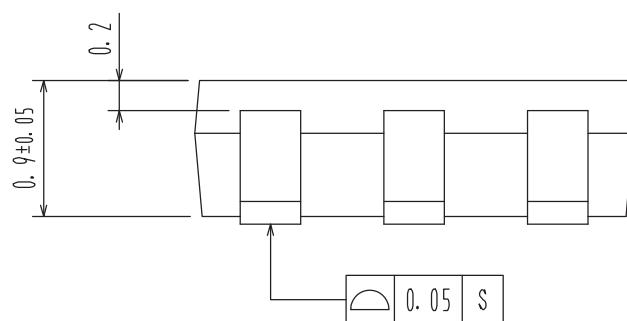
## PACKAGE DIMENSIONS

unit : mm

**CPH6**  
CASE 318BD  
ISSUE O



\*1:Lot indication



1 : Drain

2 : Drain

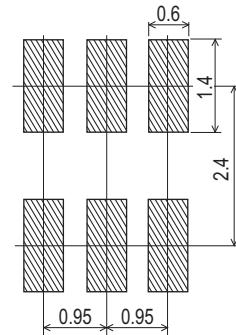
3 : Gate

#### 4 : Source

## 5. Drain

## 6 : Drain

## Recommended Soldering Footprint



## NVC6S5A354PLZ

### 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](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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