Halogen-Free Product

Advanced Power Electronics Corp.

P-CHANNEL ENHANCEMENT MODE

POWER MOSFET

▼ **Lower On-resistance**

▼ **Simple Drive Requirement**

▼ **Fast Switching Characteristic**

▼ **RoHS Compliant**
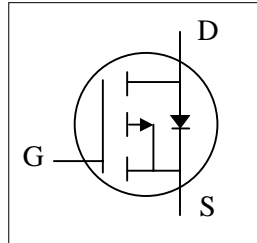
BV_{DSS}	-30V
$R_{DS(ON)}$	$9m\Omega$
I_D	-75A

TO-252(H)

TO-251(J)

Description

The TO-252 package is widely preferred for commercial-industrial surface mount applications and suited for low voltage applications such as DC/DC converters. The through-hole version (AP6679GJ) is available for low-profile applications.
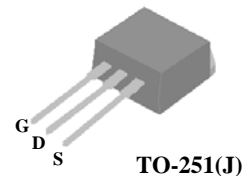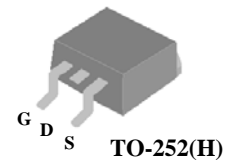
Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	-30	V
V_{GS}	Gate-Source Voltage	±20	V
$I_D@T_C=25°C$	Continuous Drain Current, V_{GS} @ 10V[3]	-75	A
$I_D@T_C=100°C$	Continuous Drain Current, V_{GS} @ 10V	-50	A
I_{DM}	Pulsed Drain Current[1]	-300	A
$P_D@T_C=25°C$	Total Power Dissipation	89	W
	Linear Derating Factor	0.71	W/°C
T_{STG}	Storage Temperature Range	-55 to 150	°C
T_J	Operating Junction Temperature Range	-55 to 150	°C

Thermal Data

Symbol	Parameter	Value	Units
Rthj-c	Maximum Thermal Resistance, Junction-case	1.4	°C/W
Rthj-a	Maximum Thermal Resistance, Junction-ambient (PCB mount)[4]	62.5	°C/W
Rthj-a	Maximum Thermal Resistance, Junction-ambient	110	°C/W

Electrical Characteristics@T$_j$=25°C(unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
BV$_{DSS}$	Drain-Source Breakdown Voltage	V$_{GS}$=0V, I$_D$=-250uA	-30	-	-	V
R$_{DS(ON)}$	Static Drain-Source On-Resistance[2]	V$_{GS}$=-10V, I$_D$=-30A	-	-	9	mΩ
		V$_{GS}$=-4.5V, I$_D$=-24A	-	-	15	mΩ
V$_{GS(th)}$	Gate Threshold Voltage	V$_{DS}$=V$_{GS}$, I$_D$=-250uA	-1	-	-3	V
g$_{fs}$	Forward Transconductance	V$_{DS}$=-10V, I$_D$=-24A	-	34	-	S
I$_{DSS}$	Drain-Source Leakage Current	V$_{DS}$=-30V, V$_{GS}$=0V	-	-	-1	uA
	Drain-Source Leakage Current (T$_j$=125°C)	V$_{DS}$=-24V, V$_{GS}$=0V	-	-	-250	uA
I$_{GSS}$	Gate-Source Leakage	V$_{GS}$= $\pm$20V, V$_{DS}$=0V	-	-	+100	nA
Q$_g$	Total Gate Charge[2]	I$_D$=-16A	-	42	67	nC
Q$_{gs}$	Gate-Source Charge	V$_{DS}$=-24V	-	6	-	nC
Q$_{gd}$	Gate-Drain ("Miller") Charge	V$_{GS}$=-4.5V	-	25	-	nC
t$_{d(on)}$	Turn-on Delay Time[2]	V$_{DS}$=-15V	-	11	-	ns
t$_r$	Rise Time	I$_D$=-16A	-	35	-	ns
t$_{d(off)}$	Turn-off Delay Time	R$_G$=3.3Ω,V$_{GS}$=-10V	-	58	-	ns
t$_f$	Fall Time	R$_D$=0.94Ω	-	78	-	ns
C$_{iss}$	Input Capacitance	V$_{GS}$=0V	-	2870	4590	pF
C$_{oss}$	Output Capacitance	V$_{DS}$=-25V	-	960	-	pF
C$_{rss}$	Reverse Transfer Capacitance	f=1.0MHz	-	740	-	pF

Source-Drain Diode

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
V$_{SD}$	Forward On Voltage[2]	I$_S$=-24A, V$_{GS}$=0V	-	-	-1.2	V
t$_{rr}$	Reverse Recovery Time[2]	I$_S$=-16A, V$_{GS}$=0V,	-	47	-	ns
Q$_{rr}$	Reverse Recovery Charge	dI/dt=-100A/µs	-	43	-	nC

Notes:

1.Pulse width limited by Max. junction temperature.

2.Pulse test

3.Package limitation current is -75A .

4.Surface mounted on 1 in^2 copper pad of FR4 board
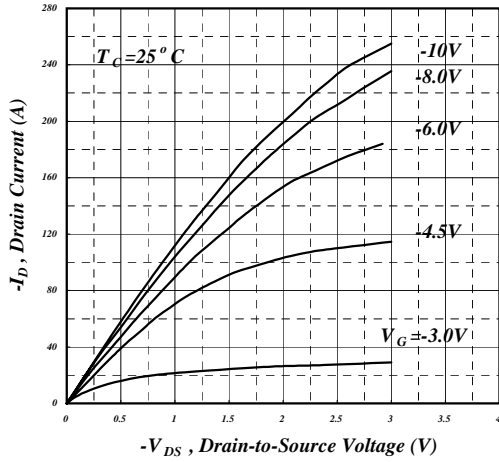
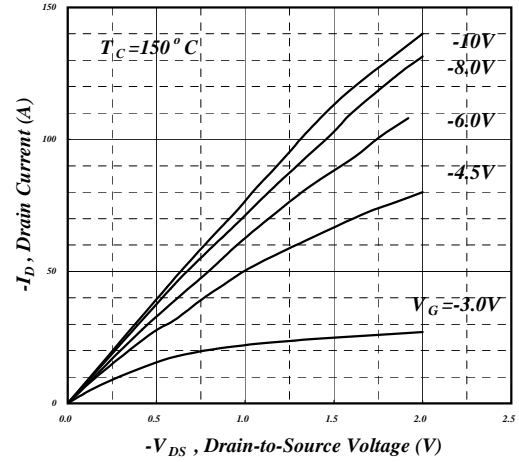**Fig 1. Typical Output Characteristics**

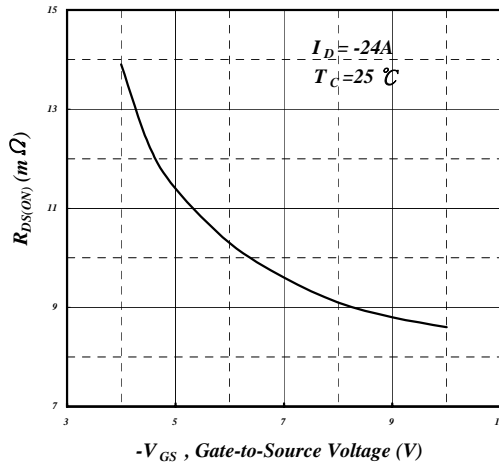**Fig 2. Typical Output Characteristics**

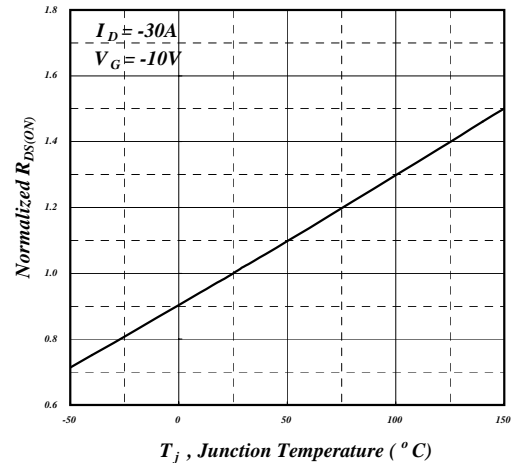**Fig 3. On-Resistance v.s. Gate Voltage**

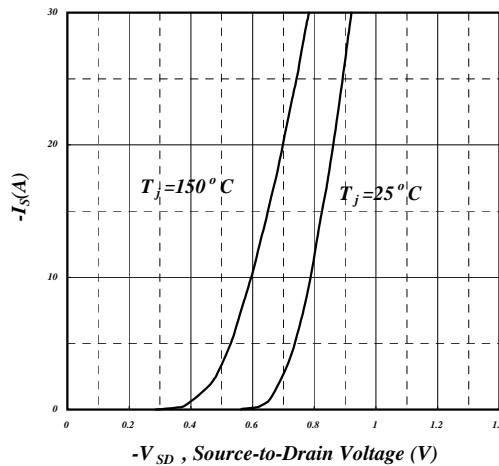**Fig 4. Normalized On-Resistance
v.s. Junction Temperature**

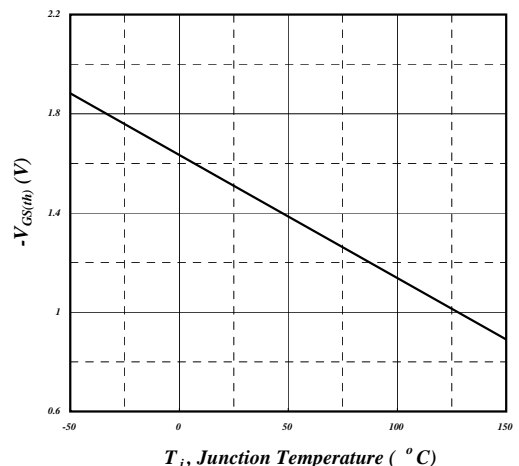**Fig 5. Forward Characteristic of
Reverse Diode**

**Fig 6. Gate Threshold Voltage v.s.
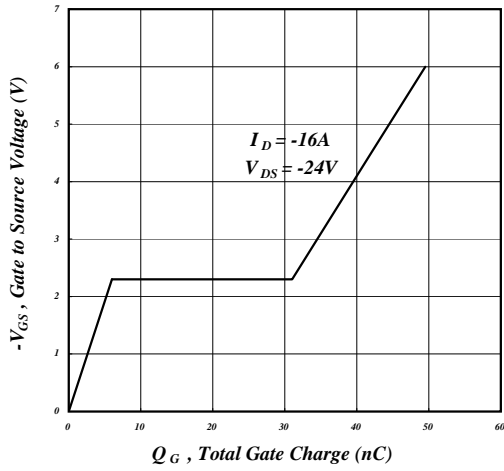Junction Temperature**
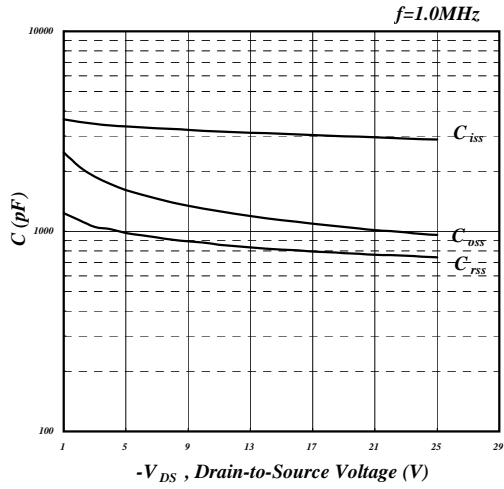
Fig 7. Gate Charge Characteristics

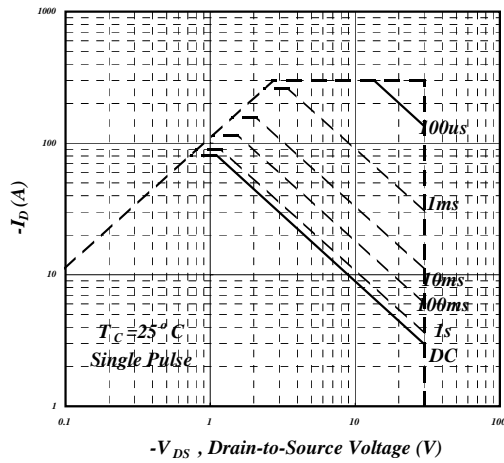Fig 8. Typical Capacitance Characteristics
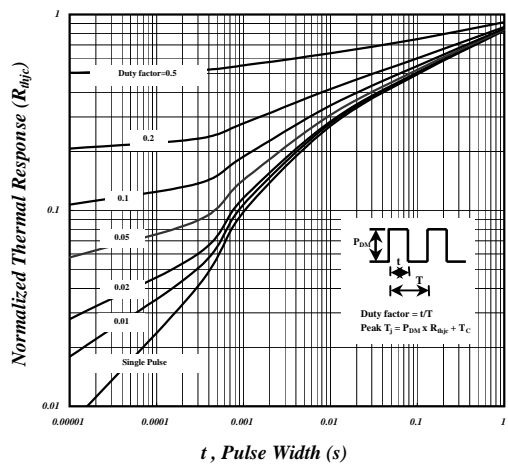
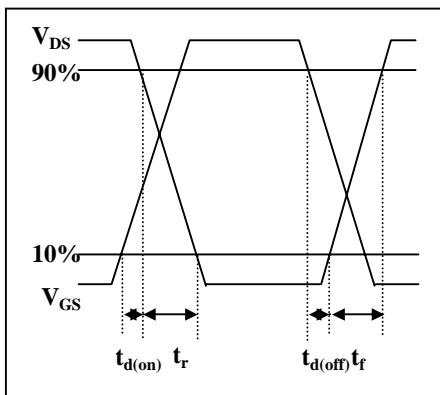Fig 9. Maximum Safe Operating Area

Fig 10. Effective Transient Thermal Impedance

Fig 11. Switching Time Waveform

Fig 12. Gate Charge Waveform

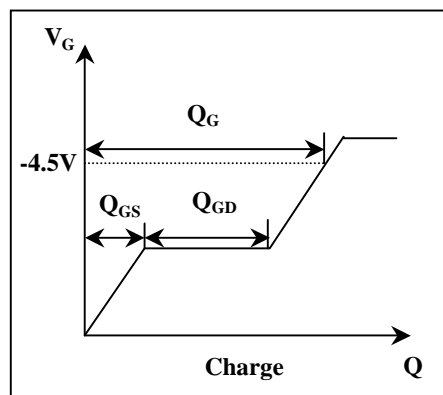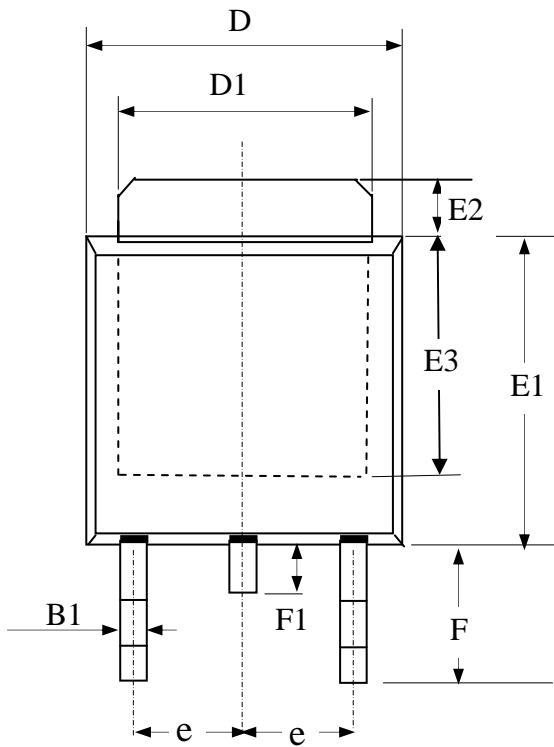![Advanced Power Electronics Corp. logo] **ADVANCED POWER ELECTRONICS CORP.**

Package Outline : TO-252

SYMBOLS	Millimeters		
	MIN	NOM	MAX
A2	1.80	2.30	2.80
A3	0.40	0.50	0.60
B1	0.40	0.70	1.00
D	6.00	6.50	7.00
D1	4.80	5.35	5.90
E3	3.50	4.00	4.50
F	2.20	2.63	3.05
F1	0.50	0.85	1.20
E1	5.10	5.70	6.30
E2	0.50	1.10	1.80
e	--	2.30	--
C	0.35	0.50	0.65

1.All Dimensions Are in Millimeters.

2.Dimension Does Not Include Mold Protrusions.

R : 0.127~0.381

(0.1mm
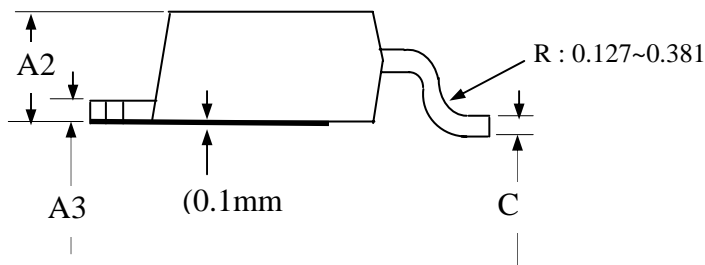
Part Marking Information & Packing : TO-252

Laser Marking
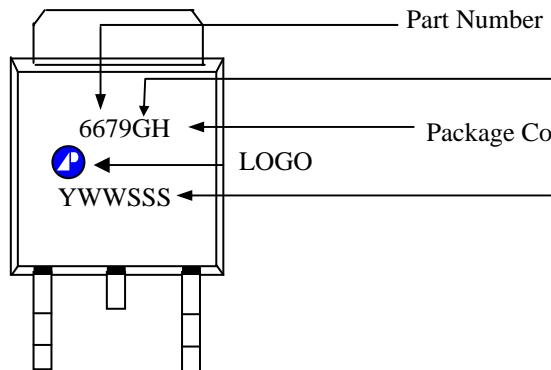
Part Number

Meet Rohs requirement
for low voltage MOSFET only

6679GH

Package Code

LOGO

YWWSSS

Date Code (YWWSSS)

Y ：Last Digit Of The Year

WW ：Week

SSS ：Sequence

If last "S" is numerical letter : Rohs product

If last "S" is English letter : HF & Rohs product

Package Outline : TO-251

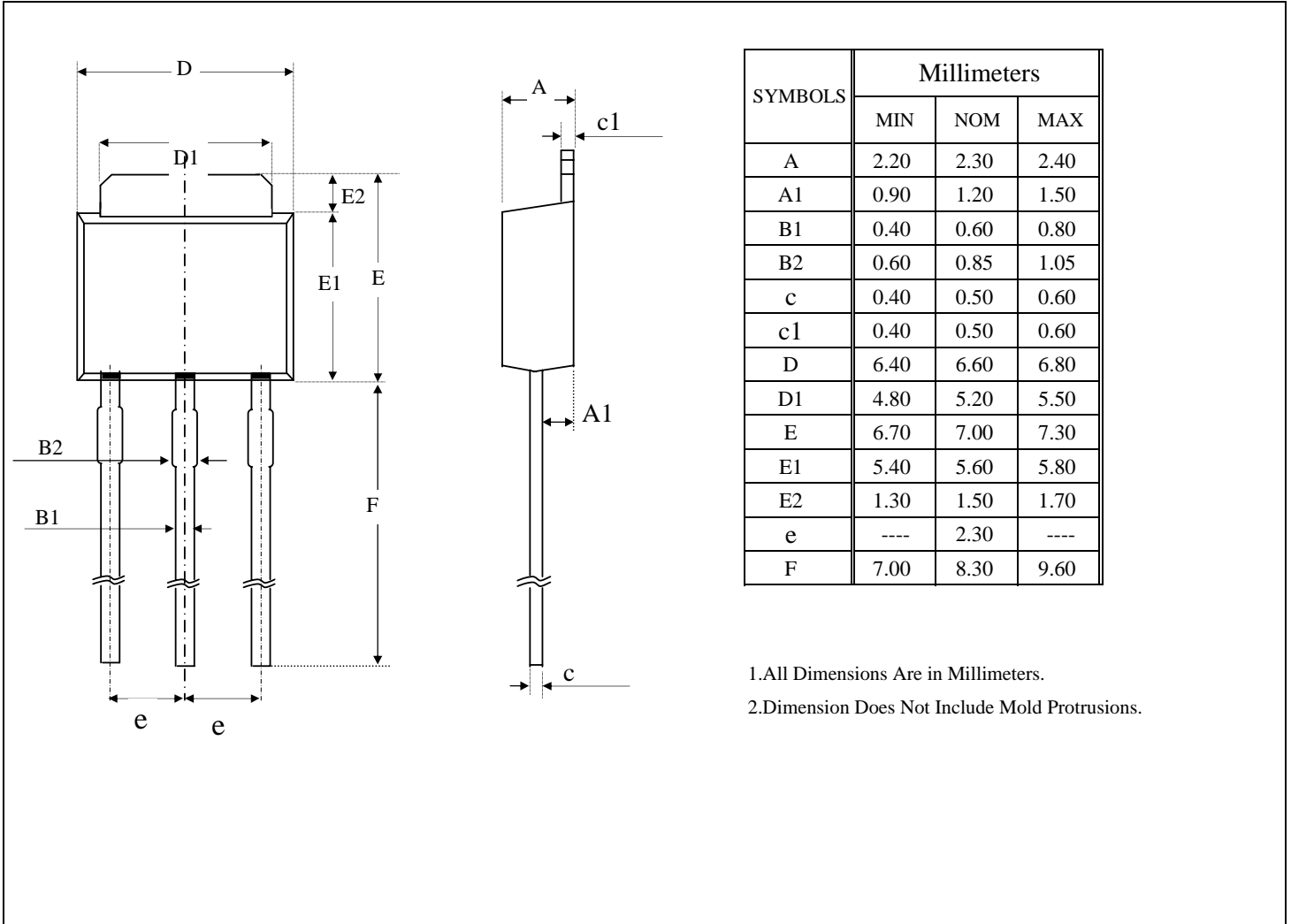| SYMBOLS	Millimeters		
	MIN	NOM	MAX
A	2.20	2.30	2.40
A1	0.90	1.20	1.50
B1	0.40	0.60	0.80
B2	0.60	0.85	1.05
c	0.40	0.50	0.60
c1	0.40	0.50	0.60
D	6.40	6.60	6.80
D1	4.80	5.20	5.50
E	6.70	7.00	7.30
E1	5.40	5.60	5.80
E2	1.30	1.50	1.70
e	----	2.30	----
F	7.00	8.30	9.60

1.All Dimensions Are in Millimeters.

2.Dimension Does Not Include Mold Protrusions.

Part Marking Information & Packing : TO-251

Part Number

meet Rohs requirement
for low voltage MOSFET only

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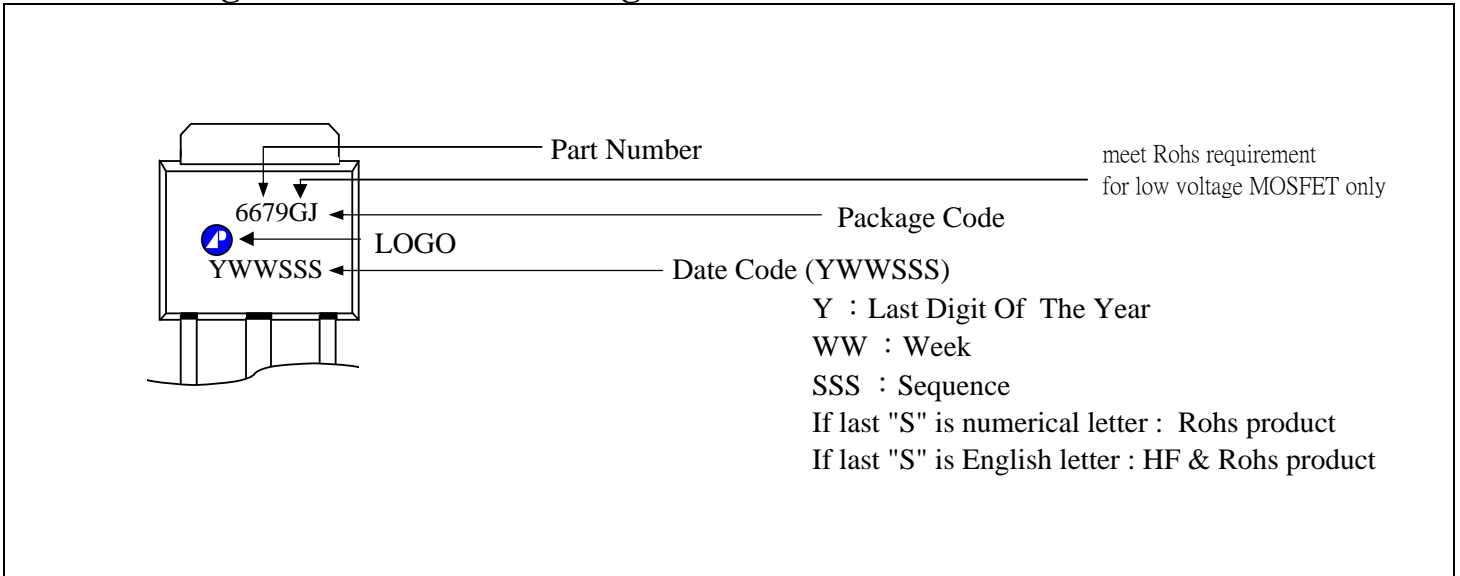If last "S" is English letter : HF & Rohs product

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