



N-CHANNEL MOSFET

Qualified per MIL-PRF-19500/557

*Qualified Levels:
JAN, JANTX, JANTXV
and JANS**

DESCRIPTION

This family of switching transistors is military qualified up to the JANTXV level for high-reliability applications. The 2N6798U part number is also qualified to the JANS level. These devices are also available in a TO-205AF (TO-39) package. Microsemi also offers numerous other transistor products to meet higher and lower power ratings with various switching speed requirements in both through-hole and surface-mount packages.

Important: For the latest information, visit our website <http://www.microsemi.com>.

FEATURES

- Surface mount equivalent of JEDEC registered 2N6796, 2N6798, 2N6800 and 2N6802 number series.
- JAN, JANTX, and JANTXV qualifications are available per MIL-PRF-19500/557.
*JANS qualification is available on 2N6798U only.
(See [part nomenclature](#) for all available options.)
- RoHS compliant by design.

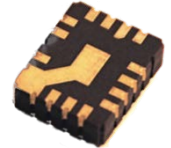
APPLICATIONS / BENEFITS

- Compact surface mount design enables mounting in crowded areas.
- Military and other high-reliability applications.

MAXIMUM RATINGS @ T_A = +25 °C unless otherwise stated

Parameters / Test Conditions	Symbol	Value	Unit
Operating & Storage Junction Temperature Range	T _J & T _{stg}	-55 to +150	°C
Thermal Resistance Junction-to-Case (see Figure 1)	R _{θJC}	5.0	°C/W
Total Power Dissipation	P _T	0.8 25	W
		@ T _A = +25 °C @ T _C = +25 °C ⁽¹⁾	
Drain-Source Voltage, dc	V _{DS}	100 200 400 500	V
		2N6796U 2N6798U 2N6800U 2N6802U	
Gate-Source Voltage, dc	V _{GS}	± 20	V
Drain Current, dc @ T _C = +25 °C ⁽²⁾	I _{D1}	8.0 5.5 3.0 2.5	A
		2N6796U 2N6798U 2N6800U 2N6802U	
Drain Current, dc @ T _C = +100 °C ⁽²⁾	I _{D2}	5.0 3.5 2.0 1.5	A
		2N6796U 2N6798U 2N6800U 2N6802U	
Off-State Current (Peak Total Value) ⁽³⁾	I _{DM}	32 22 14 11	A (pk)
		2N6796U 2N6798U 2N6800U 2N6802U	
Source Current	I _S	8.0 5.5 3.0 2.5	A
		2N6796U 2N6798U 2N6800U 2N6802U	

See notes on next page.



U-18 LCC Package

Also available in:

**TO-205AF (TO-39)
package**

(Leaded Top Hat)
**2N6796, 2N6798,
2N6800 & 2N6802**

MSC – Lawrence

6 Lake Street, Lawrence,
MA 01841
Tel: 1-800-446-1158 or
(978) 620-2600
Fax: (978) 689-0803

MSC – Ireland

Gort Road Business Park,
Ennis, Co. Clare, Ireland
Tel: +353 (0) 65 6840044
Fax: +353 (0) 65 6822298

Website:

www.microsemi.com

- Notes:**
- Derate linearly 0.2 W/°C for $T_C > +25$ °C.
 - The following formula derives the maximum theoretical I_D limit. I_D is also limited by package and internal wires and may be limited due to pin diameter.

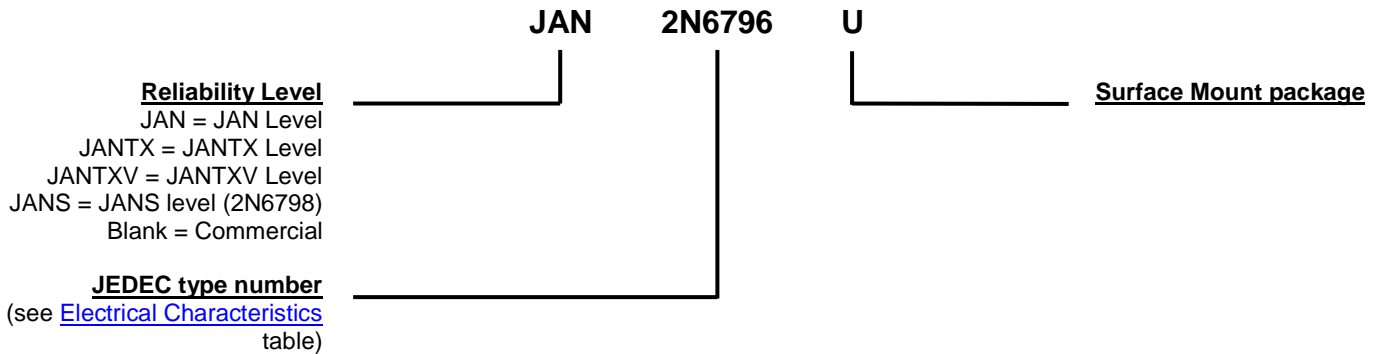
$$I_D = \sqrt{\frac{T_J(\max) - T_C}{R_{\theta JC} \times R_{DS(on)} @ T_J(\max)}}$$

- $I_{DM} = 4 \times I_{D1}$ as calculated in note 1.

MECHANICAL and PACKAGING

- CASE: Ceramic LCC-18 with kovar gold plated lid.
- TERMINALS: Gold plating over nickel.
- MARKING: Manufacturer's ID, part number, date code, ESD symbol at Pin 1 location.
- TAPE & REEL option: Standard per EIA-481-D. Consult factory for quantities.
- See [Package Dimensions](#) on last page.

PART NOMENCLATURE



SYMBOLS & DEFINITIONS

Symbol	Definition
di/dt	Rate of change of diode current while in reverse-recovery mode, recorded as maximum value.
I_F	Forward current
R_G	Gate drive impedance
V_{DD}	Drain supply voltage
V_{DS}	Drain source voltage, dc
V_{GS}	Gate source voltage, dc

ELECTRICAL CHARACTERISTICS @ $T_A = +25\text{ }^\circ\text{C}$, unless otherwise noted

Parameters / Test Conditions	Symbol	Min.	Max.	Unit
OFF CHARACTERISTICS				
Drain-Source Breakdown Voltage $V_{GS} = 0\text{ V}, I_D = 1.0\text{ mA}$	$V_{(BR)DSS}$	100 200 400 500		V
Gate-Source Voltage (Threshold) $V_{DS} \geq V_{GS}, I_D = 0.25\text{ mA}$ $V_{DS} \geq V_{GS}, I_D = 0.25\text{ mA}, T_J = +125\text{ }^\circ\text{C}$ $V_{DS} \geq V_{GS}, I_D = 0.25\text{ mA}, T_J = -55\text{ }^\circ\text{C}$	$V_{GS(th)1}$ $V_{GS(th)2}$ $V_{GS(th)3}$	2.0 1.0	4.0 5.0	V
Gate Current $V_{GS} = \pm 20\text{ V}, V_{DS} = 0\text{ V}$ $V_{GS} = \pm 20\text{ V}, V_{DS} = 0\text{ V}, T_J = +125\text{ }^\circ\text{C}$	I_{GSS1} I_{GSS2}		± 100 ± 200	nA
Drain Current $V_{GS} = 0\text{ V}, V_{DS} = 80\text{ V}$ $V_{GS} = 0\text{ V}, V_{DS} = 160\text{ V}$ $V_{GS} = 0\text{ V}, V_{DS} = 320\text{ V}$ $V_{GS} = 0\text{ V}, V_{DS} = 400\text{ V}$	I_{DSS1}		25	μA
Drain Current $V_{GS} = 0\text{ V}, V_{DS} = 80\text{ V}, T_J = +125\text{ }^\circ\text{C}$ $V_{GS} = 0\text{ V}, V_{DS} = 160\text{ V}, T_J = +125\text{ }^\circ\text{C}$ $V_{GS} = 0\text{ V}, V_{DS} = 320\text{ V}, T_J = +125\text{ }^\circ\text{C}$ $V_{GS} = 0\text{ V}, V_{DS} = 400\text{ V}, T_J = +125\text{ }^\circ\text{C}$	I_{DSS2}		0.25	mA
Static Drain-Source On-State Resistance $V_{GS} = 10\text{ V}, I_D = 5.0\text{ A pulsed}$ $V_{GS} = 10\text{ V}, I_D = 3.5\text{ A pulsed}$ $V_{GS} = 10\text{ V}, I_D = 2.0\text{ A pulsed}$ $V_{GS} = 10\text{ V}, I_D = 1.5\text{ A pulsed}$	$r_{DS(on)1}$		0.18 0.40 1.00 1.50	Ω
Static Drain-Source On-State Resistance $V_{GS} = 10\text{ V}, I_D = 8.0\text{ A pulsed}$ $V_{GS} = 10\text{ V}, I_D = 5.5\text{ A pulsed}$ $V_{GS} = 10\text{ V}, I_D = 3.0\text{ A pulsed}$ $V_{GS} = 10\text{ V}, I_D = 2.5\text{ A pulsed}$	$r_{DS(on)2}$		0.195 0.420 1.100 1.600	Ω
Static Drain-Source On-State Resistance $T_J = +125\text{ }^\circ\text{C}$ $V_{GS} = 10\text{ V}, I_D = 5.0\text{ A pulsed}$ $V_{GS} = 10\text{ V}, I_D = 3.5\text{ A pulsed}$ $V_{GS} = 10\text{ V}, I_D = 2.0\text{ A pulsed}$ $V_{GS} = 10\text{ V}, I_D = 1.5\text{ A pulsed}$	$r_{DS(on)3}$		0.35 0.75 2.40 3.50	Ω
Diode Forward Voltage $V_{GS} = 0\text{ V}, I_D = 8.0\text{ A pulsed}$ $V_{GS} = 0\text{ V}, I_D = 5.5\text{ A pulsed}$ $V_{GS} = 0\text{ V}, I_D = 3.0\text{ A pulsed}$ $V_{GS} = 0\text{ V}, I_D = 2.5\text{ A pulsed}$	V_{SD}		1.5 1.4 1.4 1.4	V

ELECTRICAL CHARACTERISTICS @ $T_A = +25\text{ }^\circ\text{C}$, unless otherwise noted (continued)
DYNAMIC CHARACTERISTICS

Parameters / Test Conditions	Symbol	Min.	Max.	Unit
Gate Charge:				
On-State Gate Charge				
$V_{GS} = 10\text{ V}, I_D = 8.0\text{ A}, V_{DS} = 50\text{ V}$	2N6796U		28.51	nC
$V_{GS} = 10\text{ V}, I_D = 5.5\text{ A}, V_{DS} = 50\text{ V}$	2N6798U		42.07	
$V_{GS} = 10\text{ V}, I_D = 3.0\text{ A}, V_{DS} = 50\text{ V}$	2N6800U		34.75	
$V_{GS} = 10\text{ V}, I_D = 2.5\text{ A}, V_{DS} = 50\text{ V}$	2N6802U		33.00	
Gate to Source Charge				
$V_{GS} = 10\text{ V}, I_D = 8.0\text{ A}, V_{DS} = 50\text{ V}$	2N6796U		6.34	nC
$V_{GS} = 10\text{ V}, I_D = 5.5\text{ A}, V_{DS} = 50\text{ V}$	2N6798U		5.29	
$V_{GS} = 10\text{ V}, I_D = 3.0\text{ A}, V_{DS} = 50\text{ V}$	2N6800U		5.75	
$V_{GS} = 10\text{ V}, I_D = 2.5\text{ A}, V_{DS} = 50\text{ V}$	2N6802U		4.46	
Gate to Drain Charge				
$V_{GS} = 10\text{ V}, I_D = 8.0\text{ A}, V_{DS} = 50\text{ V}$	2N6796U		16.59	nC
$V_{GS} = 10\text{ V}, I_D = 5.5\text{ A}, V_{DS} = 50\text{ V}$	2N6798U		28.11	
$V_{GS} = 10\text{ V}, I_D = 3.0\text{ A}, V_{DS} = 50\text{ V}$	2N6800U		16.59	
$V_{GS} = 10\text{ V}, I_D = 2.5\text{ A}, V_{DS} = 50\text{ V}$	2N6802U		28.11	

SWITCHING CHARACTERISTICS

Parameters / Test Conditions	Symbol	Min.	Max.	Unit
Turn-on delay time				
$I_D = 8.0\text{ A}, V_{GS} = +10\text{ V}, R_G = 7.5\text{ }\Omega, V_{DD} = 30\text{ V}$	2N6796U		30	ns
$I_D = 5.5\text{ A}, V_{GS} = +10\text{ V}, R_G = 7.5\text{ }\Omega, V_{DD} = 77\text{ V}$	2N6798U			
$I_D = 3.0\text{ A}, V_{GS} = +10\text{ V}, R_G = 7.5\text{ }\Omega, V_{DD} = 176\text{ V}$	2N6800U			
$I_D = 2.5\text{ A}, V_{GS} = +10\text{ V}, R_G = 7.5\text{ }\Omega, V_{DD} = 225\text{ V}$	2N6802U			
Rinse time				
$I_D = 8.0\text{ A}, V_{GS} = +10\text{ V}, R_G = 7.5\text{ }\Omega, V_{DD} = 30\text{ V}$	2N6796U		75	ns
$I_D = 5.5\text{ A}, V_{GS} = +10\text{ V}, R_G = 7.5\text{ }\Omega, V_{DD} = 77\text{ V}$	2N6798U		50	
$I_D = 3.0\text{ A}, V_{GS} = +10\text{ V}, R_G = 7.5\text{ }\Omega, V_{DD} = 176\text{ V}$	2N6800U		35	
$I_D = 2.5\text{ A}, V_{GS} = +10\text{ V}, R_G = 7.5\text{ }\Omega, V_{DD} = 225\text{ V}$	2N6802U		30	
Turn-off delay time				
$I_D = 8.0\text{ A}, V_{GS} = +10\text{ V}, R_G = 7.5\text{ }\Omega, V_{DD} = 30\text{ V}$	2N6796U		40	ns
$I_D = 5.5\text{ A}, V_{GS} = +10\text{ V}, R_G = 7.5\text{ }\Omega, V_{DD} = 77\text{ V}$	2N6798U		50	
$I_D = 3.0\text{ A}, V_{GS} = +10\text{ V}, R_G = 7.5\text{ }\Omega, V_{DD} = 176\text{ V}$	2N6800U		55	
$I_D = 2.5\text{ A}, V_{GS} = +10\text{ V}, R_G = 7.5\text{ }\Omega, V_{DD} = 225\text{ V}$	2N6802U		55	
Fall time				
$I_D = 8.0\text{ A}, V_{GS} = +10\text{ V}, R_G = 7.5\text{ }\Omega, V_{DD} = 30\text{ V}$	2N6796U		45	ns
$I_D = 5.5\text{ A}, V_{GS} = +10\text{ V}, R_G = 7.5\text{ }\Omega, V_{DD} = 77\text{ V}$	2N6798U		40	
$I_D = 3.0\text{ A}, V_{GS} = +10\text{ V}, R_G = 7.5\text{ }\Omega, V_{DD} = 176\text{ V}$	2N6800U		35	
$I_D = 2.5\text{ A}, V_{GS} = +10\text{ V}, R_G = 7.5\text{ }\Omega, V_{DD} = 225\text{ V}$	2N6802U		30	
Diode Reverse Recovery Time				
$di/dt \leq 100\text{ A}/\mu\text{s}, V_{DD} \leq 50\text{ V}, I_F = 8.0\text{ A}$	2N6796U		300	ns
$di/dt \leq 100\text{ A}/\mu\text{s}, V_{DD} \leq 50\text{ V}, I_F = 5.5\text{ A}$	2N6798U		500	
$di/dt \leq 100\text{ A}/\mu\text{s}, V_{DD} \leq 50\text{ V}, I_F = 3.0\text{ A}$	2N6800U		700	
$di/dt \leq 100\text{ A}/\mu\text{s}, V_{DD} \leq 50\text{ V}, I_F = 2.5\text{ A}$	2N6802U		900	

GRAPHS

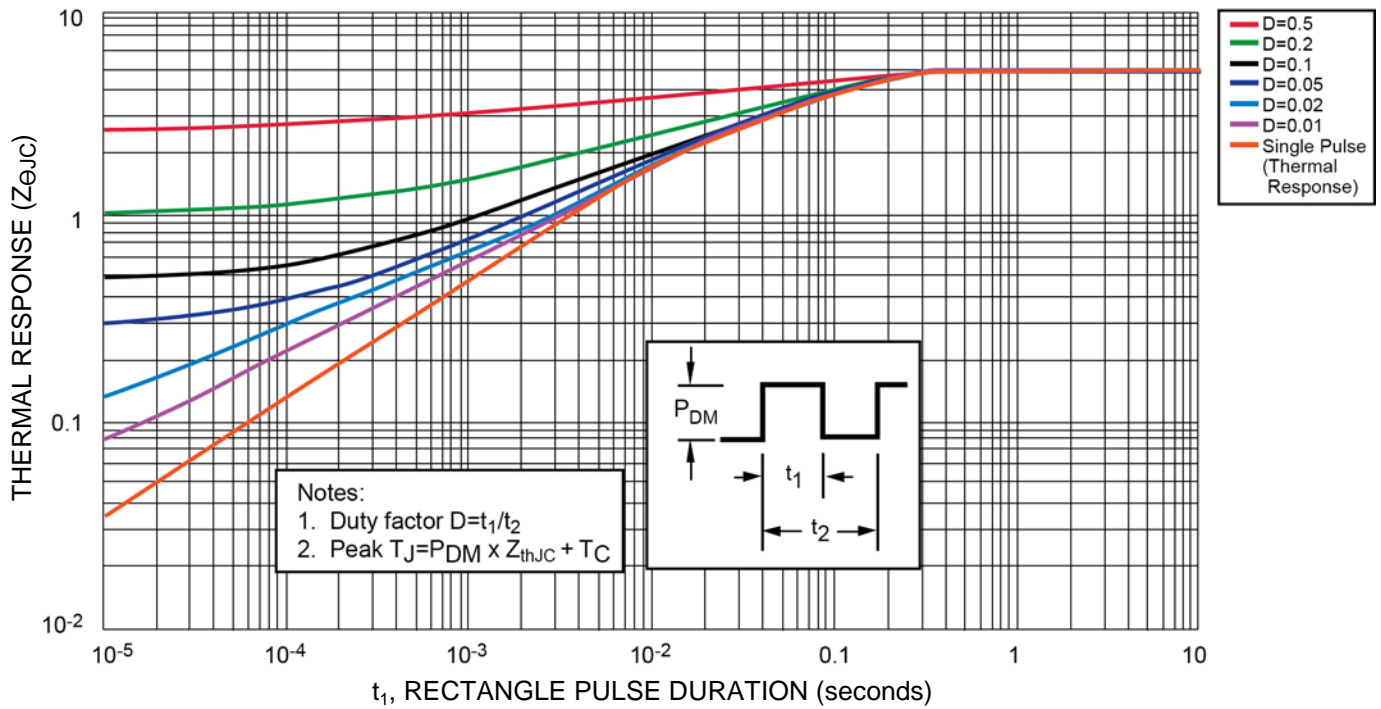
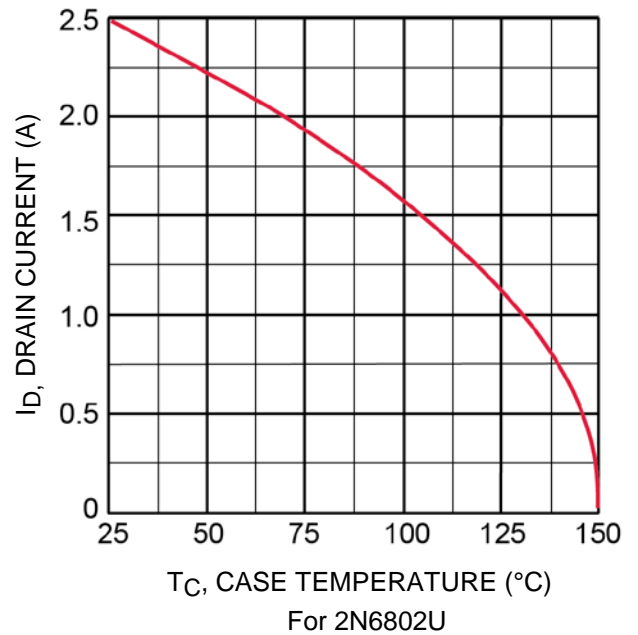
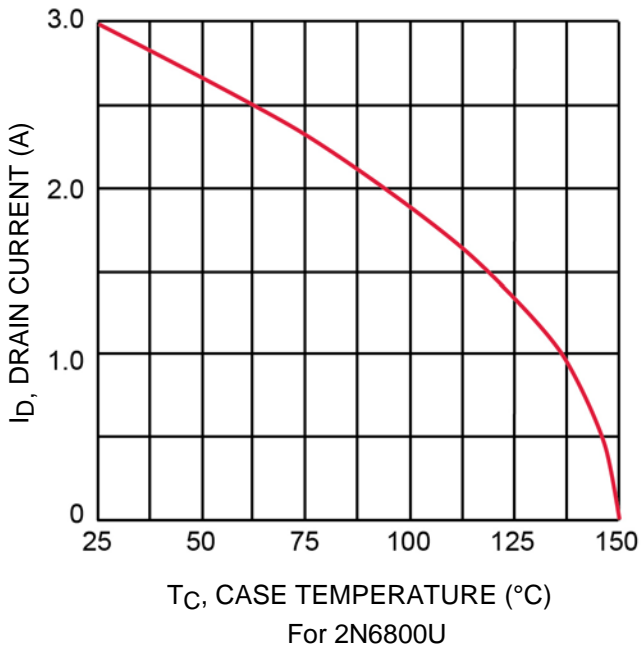
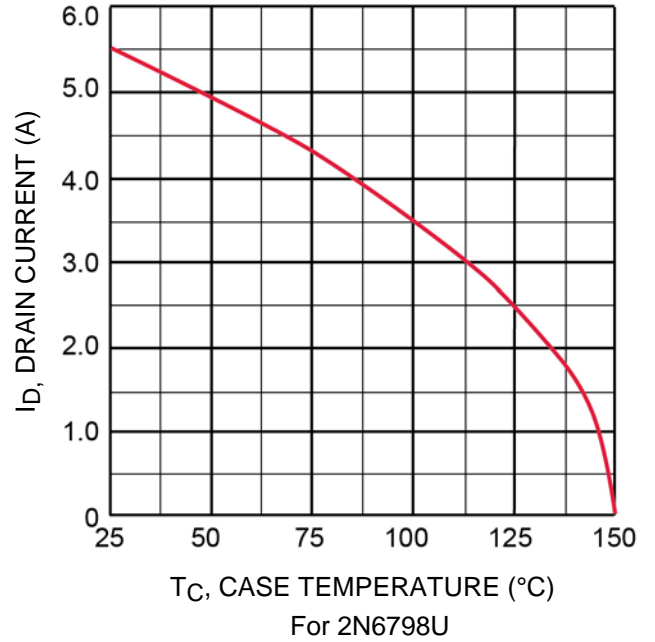
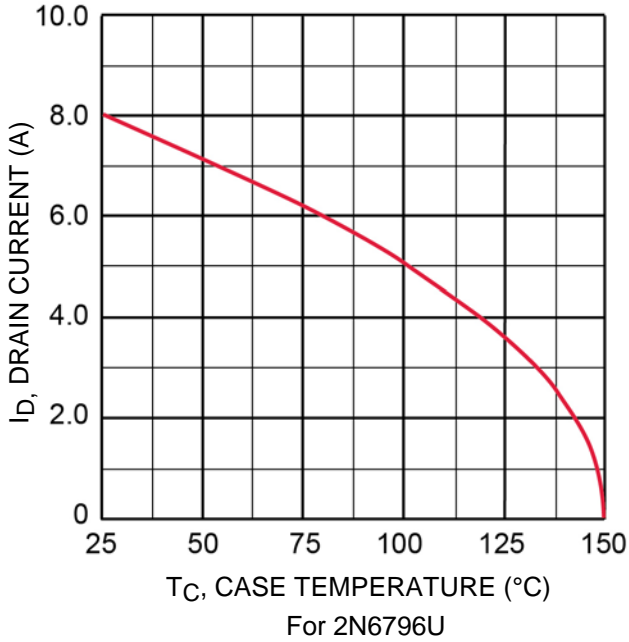
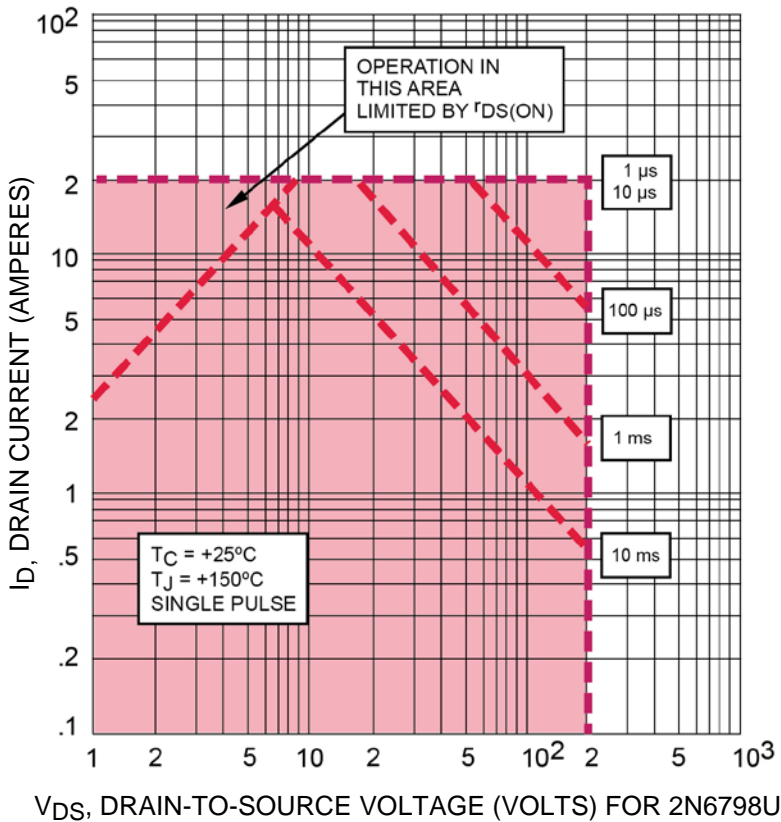
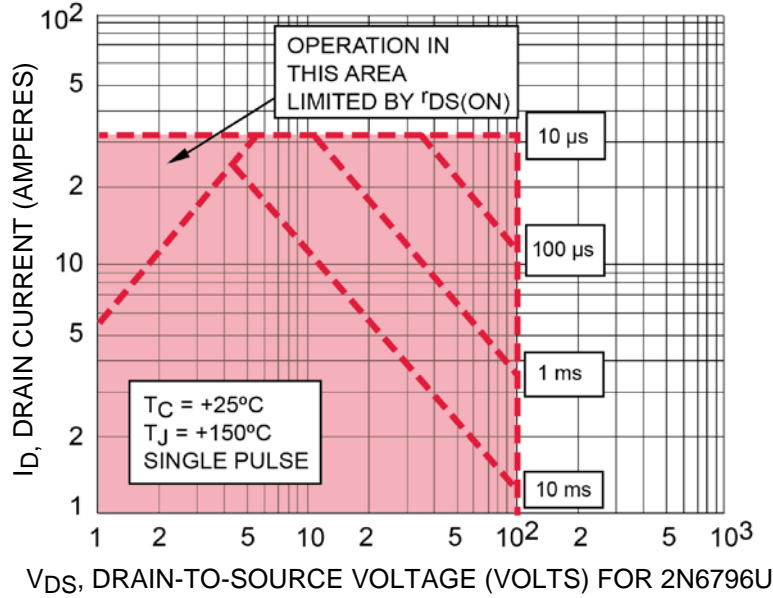


FIGURE 1 – Normalized Transient Thermal Impedance

GRAPHS (continued)
FIGURE 2 – Maximum Drain Current vs Case Temperature Graphs


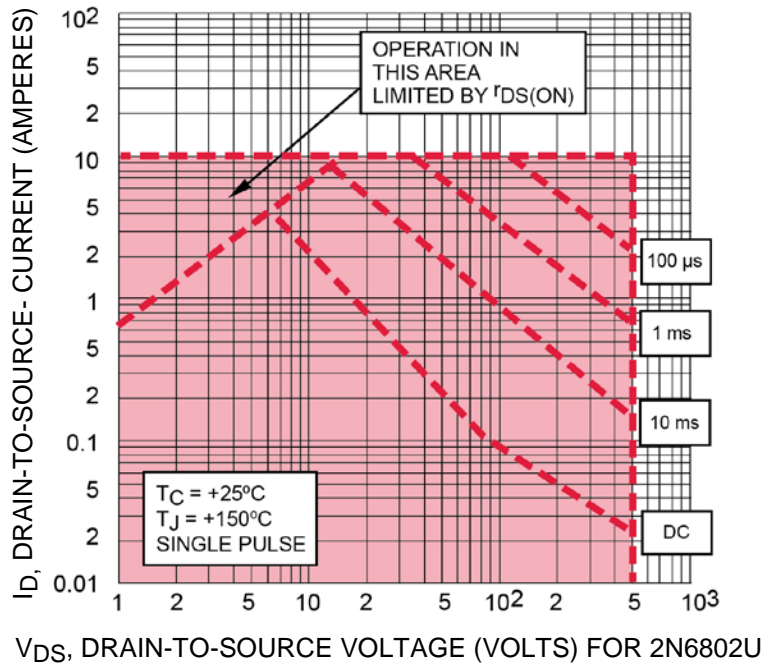
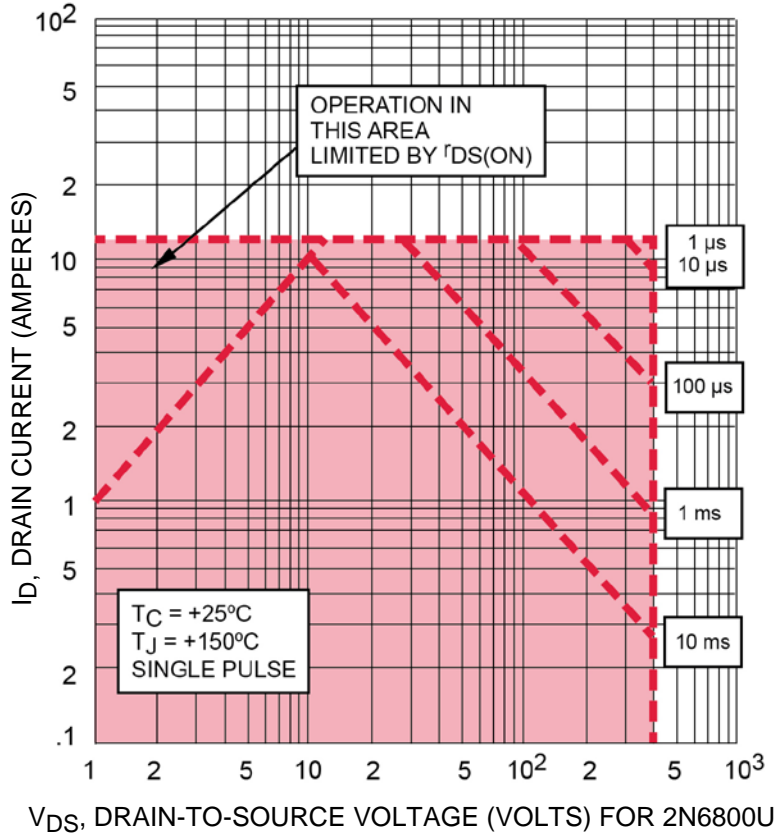
GRAPHS (continued)

FIGURE 3 – Maximum Safe Operating Area

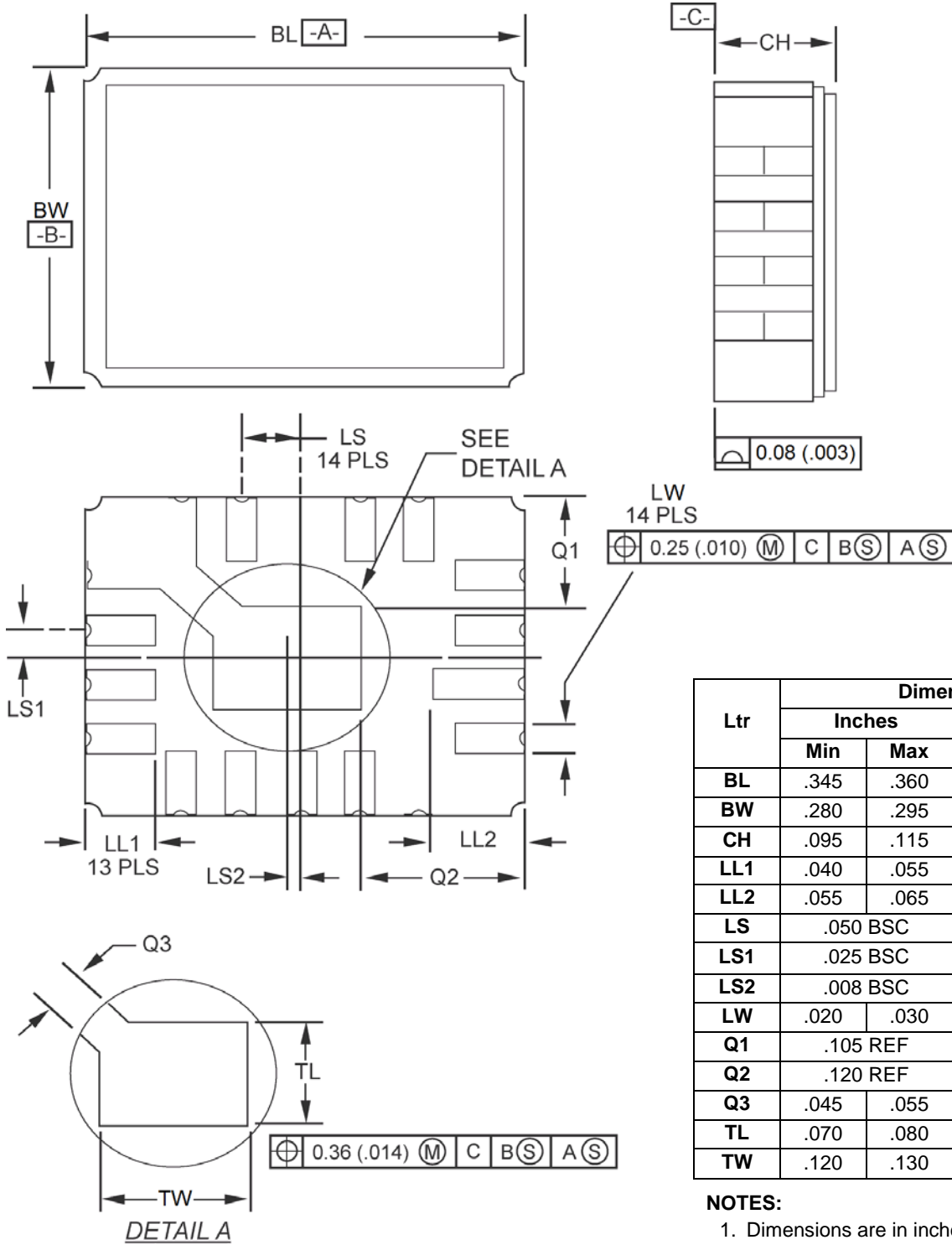


GRAPHS (continued)

FIGURE 3 – Maximum Safe Operating Area (continued)



PACKAGE DIMENSIONS

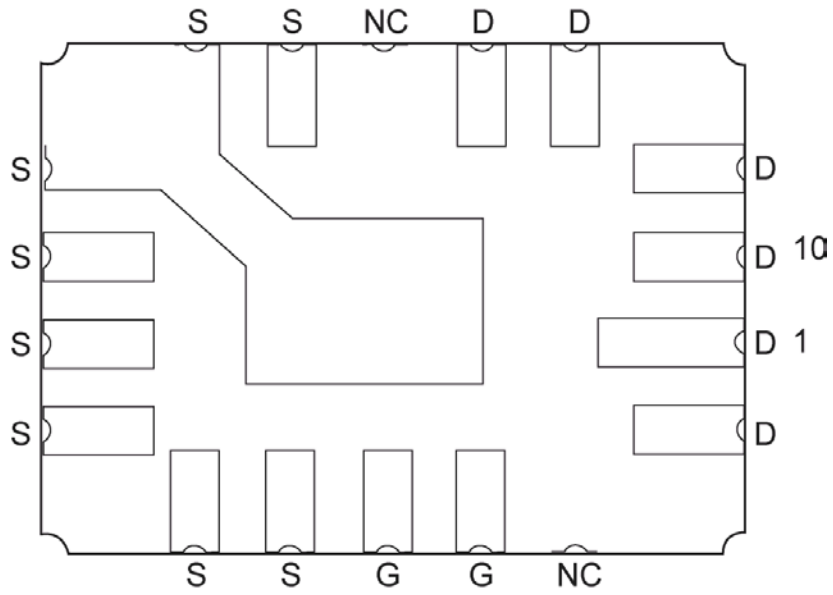


Ltr	Dimensions			
	Inches		Millimeters	
	Min	Max	Min	Max
BL	.345	.360	8.77	9.14
BW	.280	.295	7.12	7.49
CH	.095	.115	2.42	2.92
LL1	.040	.055	1.02	1.39
LL2	.055	.065	1.40	1.65
LS	.050 BSC		1.27 BSC	
LS1	.025 BSC		0.635 BSC	
LS2	.008 BSC		0.203 BSC	
LW	.020	.030	0.51	0.76
Q1	.105 REF		2.67 REF	
Q2	.120 REF		3.05 REF	
Q3	.045	.055	1.14	1.40
TL	.070	.080	1.78	2.03
TW	.120	.130	3.05	3.30

NOTES:

1. Dimensions are in inches.
2. Millimeters are given for general information only.
3. In accordance with ASME Y14.5M, diameters are equivalent to Φ x symbology.
4. Ceramic package only.

PAD LAYOUT



PAD ASSIGNMENTS