

Product Summary

V_{DS} (V)	$R_{DS(on),max}$ (mΩ)	I_D (A)
100	1.2 @ $V_{GS} = 10V$	420 ⁽¹⁾

Features

- ❖ Low $R_{DS(on)}$
- ❖ Trench power MOSFET
- ❖ Low Gate Charge

Application

- ❖ Stored energy
- ❖ Electric motorcycle

General Information

Shipping

- ❖ One shipping options is offered as standard
- ❖ Un-sawn wafer

Handling

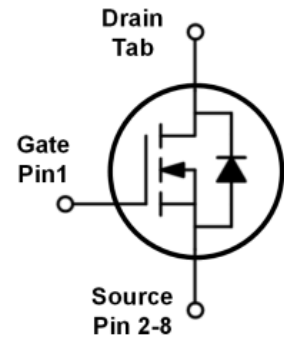
- ❖ Product must be handled only at ESD safe workstations. Standard ESD precautions and safe work environments are as defined in MIL-HDBK-263.
- ❖ Product must be handled only in a class 10,000 or better-designated clean room environmen



TOLL

NOTE:
 LOGO - GS
 GMXXXXX- Part number code
 F - Fab location code
 A - Assembly location code
 Y - Year code
 WW - Week code
 L&T - Assembly lot code

Equivalent circuit



Absolute Maximum Rating ($T_a=25^\circ\text{C}$)

Parameter	Symbol	Limit	Unit
Drain-source voltage	V_{DS}	100	V
Gate-source voltage	V_{GS}	± 20	
Continuous drain current	$T_C=25^\circ\text{C}$ ⁽¹⁾	I_D	A
	$T_C=100^\circ\text{C}$	290	
Pulsed drain current ⁽²⁾	$I_{D,pulse}$	1680	
Avalanche energy, single pulse ⁽³⁾	E_{AS}	1750	mJ
Power dissipation	$T_C=25^\circ\text{C}$	P_D	431 W
Operating junction and storage temperature range	T_J, T_{stg}	-55 to 150	$^\circ\text{C}$

Thermal Characteristic ($T_a=25^\circ\text{C}$)

Parameter	Symbol	Max.	Unit
Thermal resistance, junction-to-case	$R_{\theta JC}$	0.29	$^\circ\text{C/W}$
Thermal resistance, junction-to-ambient ⁽⁴⁾	$R_{\theta JA}$	40	

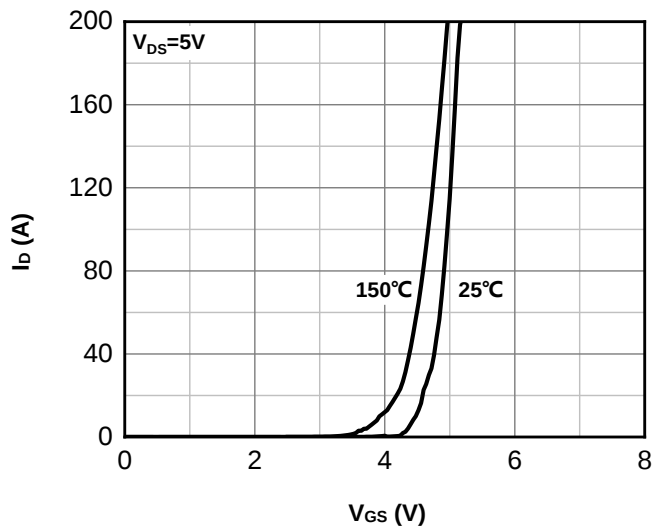
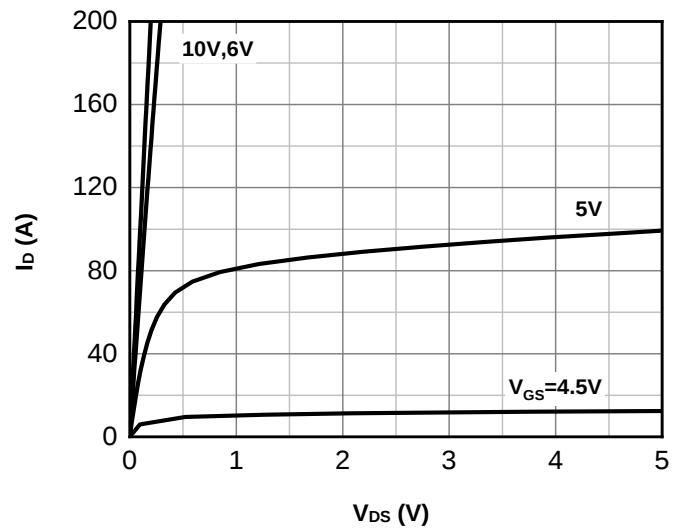
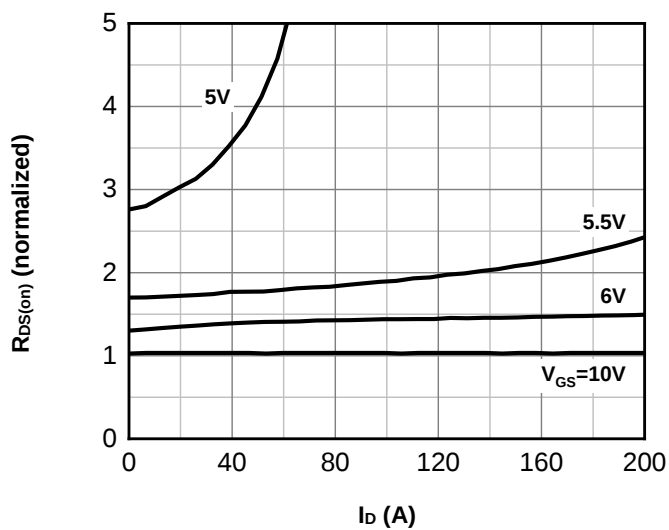
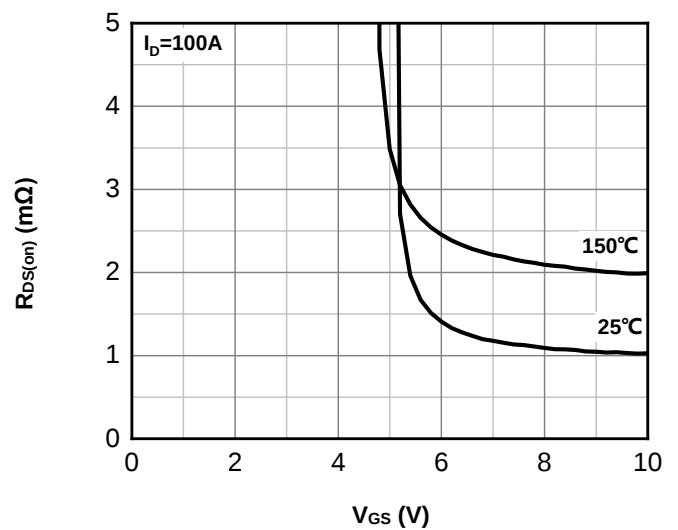
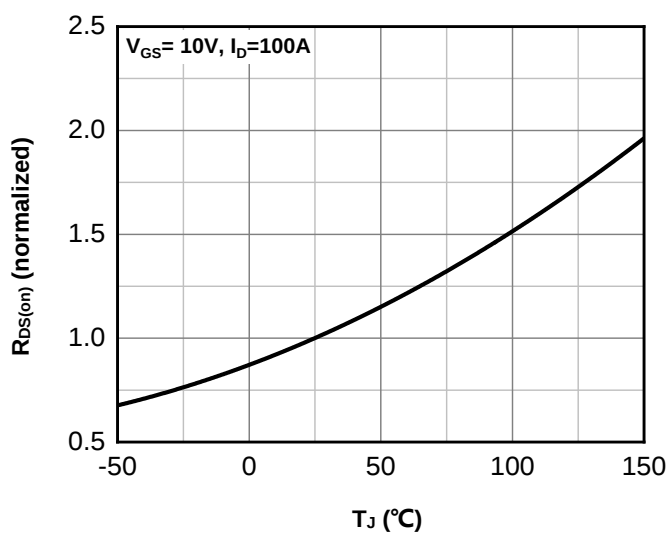
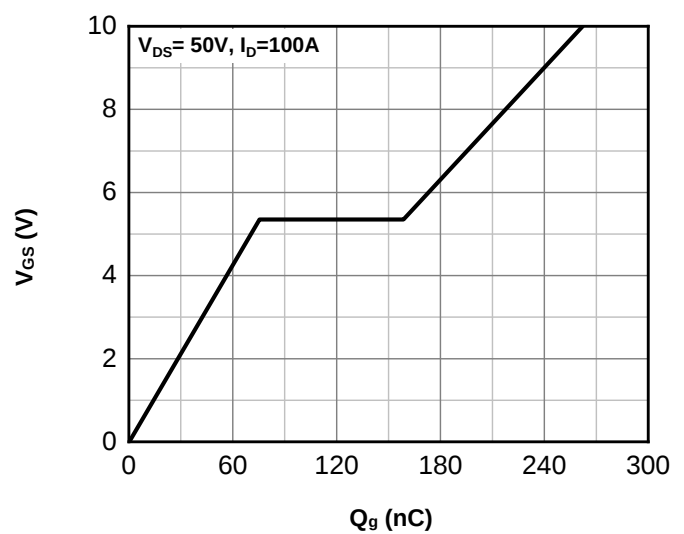
**Electrical characteristics (Ta=25°C ± 3°C)**

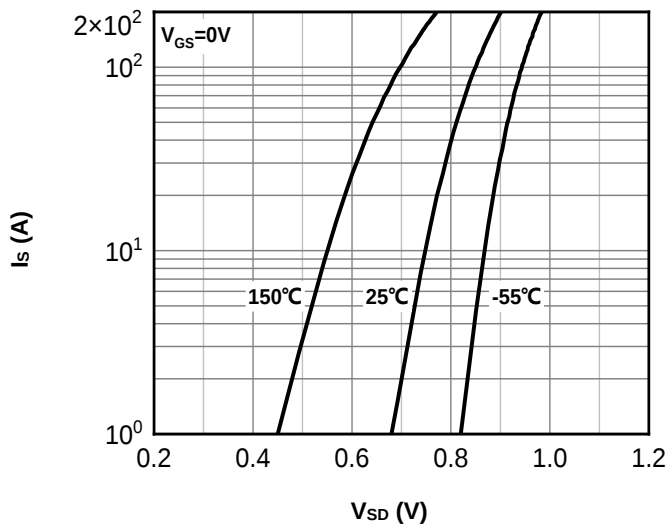
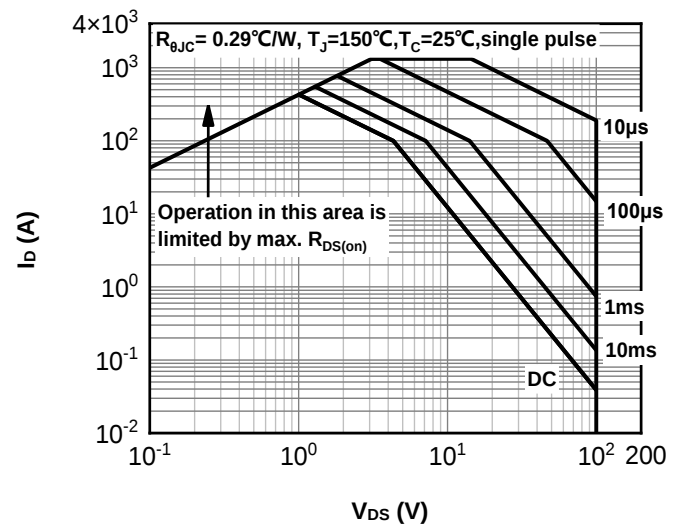
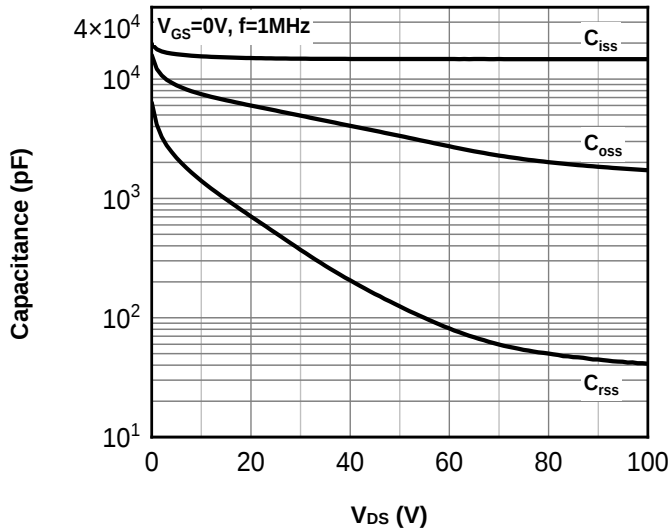
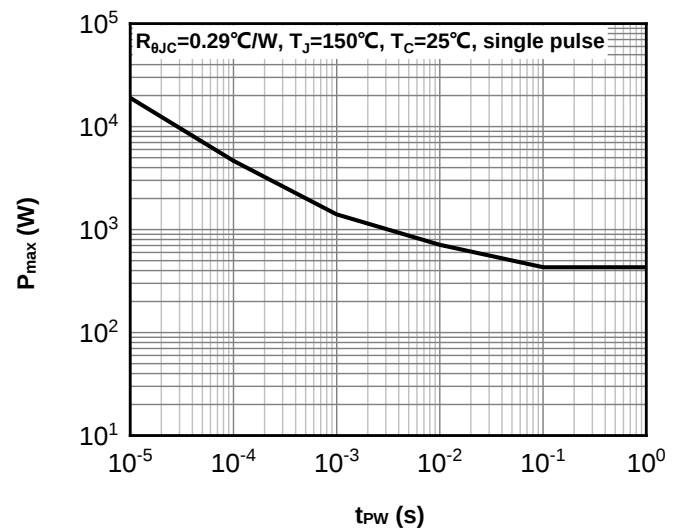
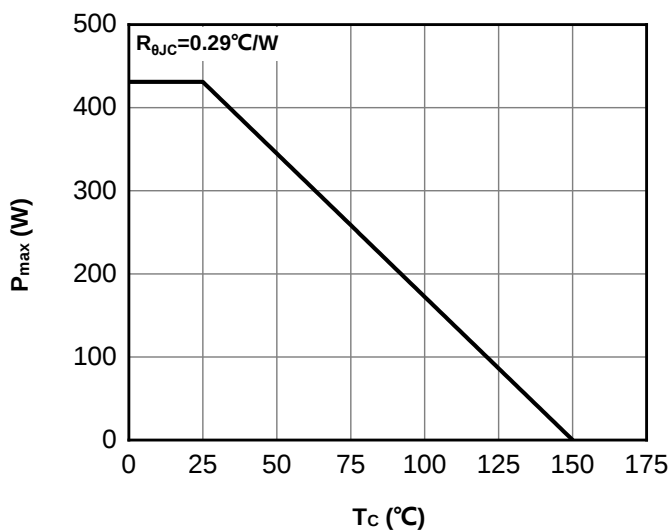
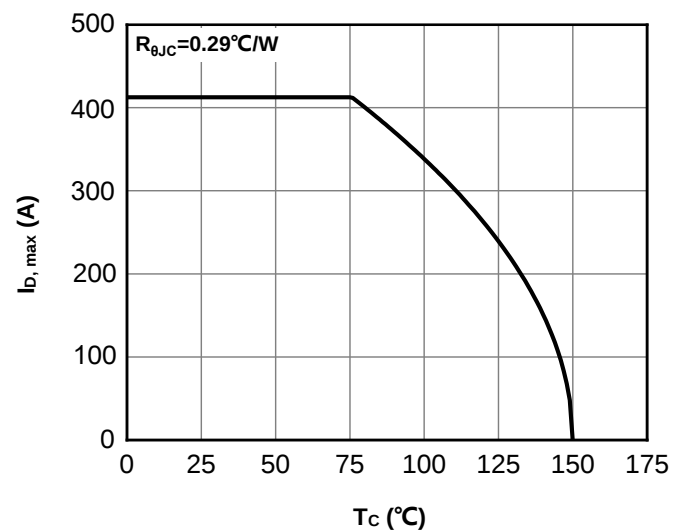
Parameter	Symbol	Test conditions	Min.	Typ.	Max.	Unit
Static parameter						
Drain to source breakdown voltage	$V_{(BR)DSS}$	$V_{GS} = 0\text{ V}$, $I_D = 1\text{ mA}$	100			V
Gate-source threshold voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = 250\text{ }\mu\text{A}$	2.2	3	3.8	V
Gate-body leakage	I_{GSS}	$V_{DS} = 0\text{ V}$, $V_{GS} = \pm 20\text{ V}$			±100	nA
Zero gate voltage drain current	I_{DSS}	$V_{DS} = 100\text{ V}$, $V_{GS} = 0\text{ V}$			1	μA
Drain-source on-resistance	$R_{DS(on)}$	$V_{GS} = 10\text{ V}$, $I_D = 100\text{ A}$		0.94	1.2	mΩ
Forward transconductance ⁽⁵⁾	g_{fs}	$V_{DS} = 5\text{ V}$, $I_D = 100\text{ A}$		380		S
Gate resistance	R_g	$f = 1\text{ MHz}$, open drain		0.9		Ω
Dynamic ⁽⁵⁾						
Total gate charge	Q_g	$V_{DS} = 50\text{ V}$, $I_D = 100\text{ A}$, $V_{GS} = 10\text{ V}$		262		nC
Gate-source charge	Q_{gs}			75		
Gate-drain charge	Q_{gd}			84		
Turn-on delay time	$t_{d(on)}$	$V_{DS} = 50\text{ V}$, $I_D = 100\text{ A}$, $V_{GS} = 10\text{ V}$, $R_{GEN} = 6\text{ }\Omega$		133		ns
Rise time	t_r			212		
Turn-off delay time	$t_{d(off)}$			116		
Fall time	t_f			130		
Input capacitance	C_{iss}	$V_{DS} = 50\text{ V}$, $V_{GS} = 0\text{ V}$, $f = 1\text{ MHz}$		14700		pF
Output capacitance	C_{oss}			3400		
Reverse transfer capacitance	C_{rss}			121		
Reverse Diode Characteristics(5)						
Diode forward voltage	V_{SD}	$V_{GS} = 0\text{ V}$, $I_F = 100\text{ A}$		0.85	1.1	V
Reverse recovery time	t_{rr}	$V_{DS} = 50\text{ V}$, $I_F = 100\text{ A}$, $di/dt = 100\text{ A}/\mu\text{s}$		104		ns
Reverse recovery charge	Q_{rr}			270		nC

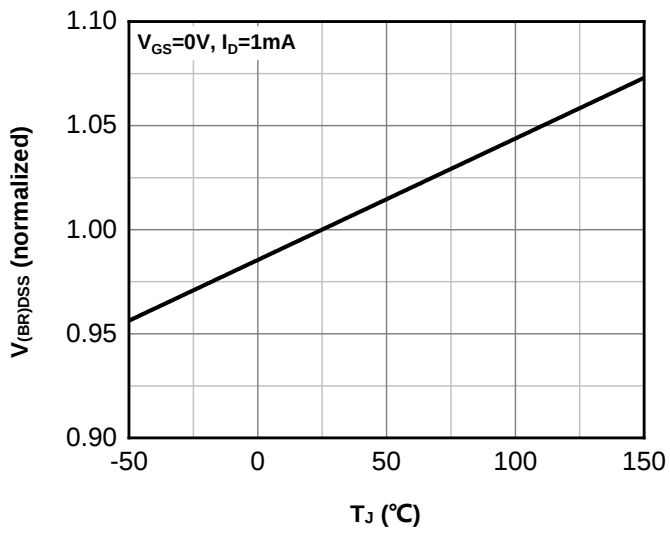
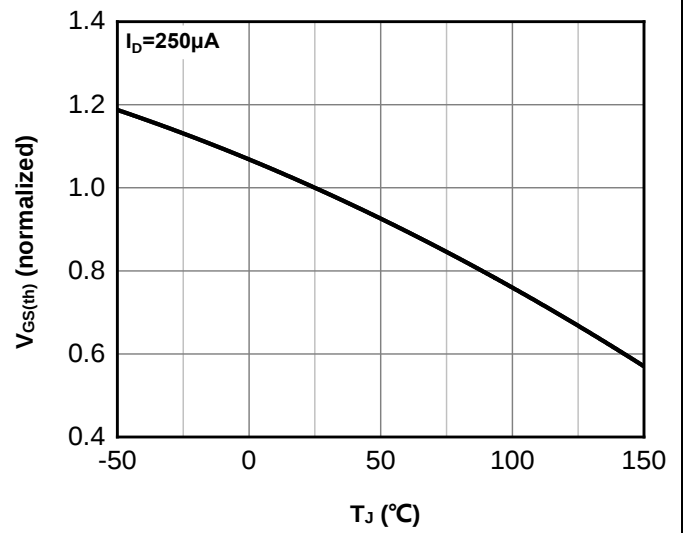
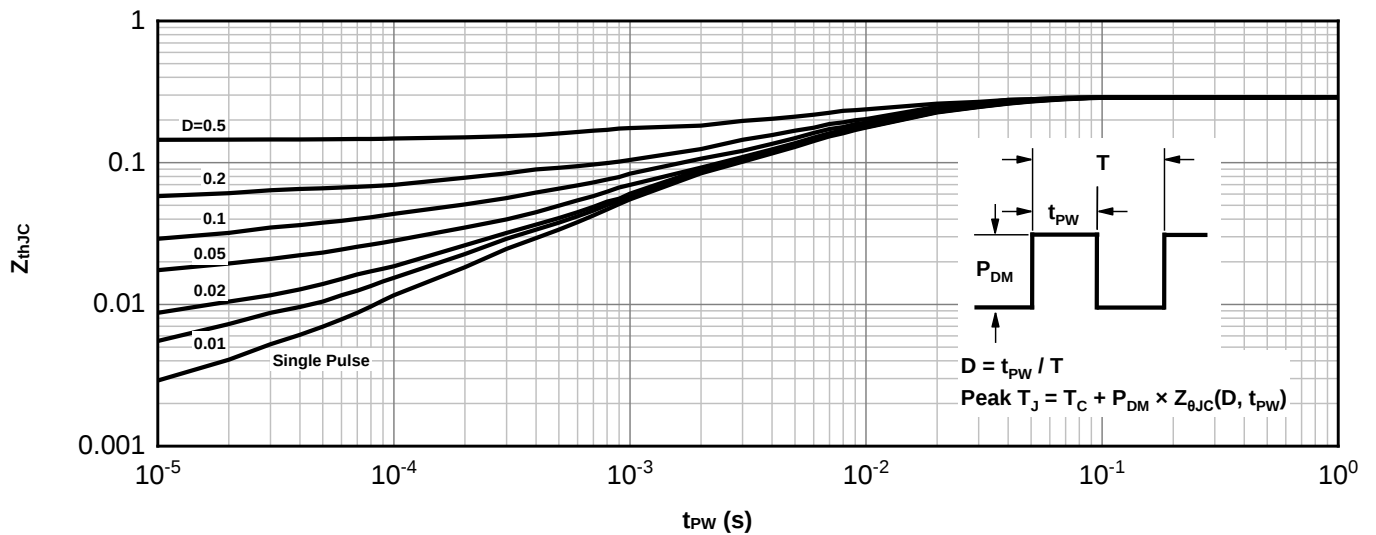
Notes

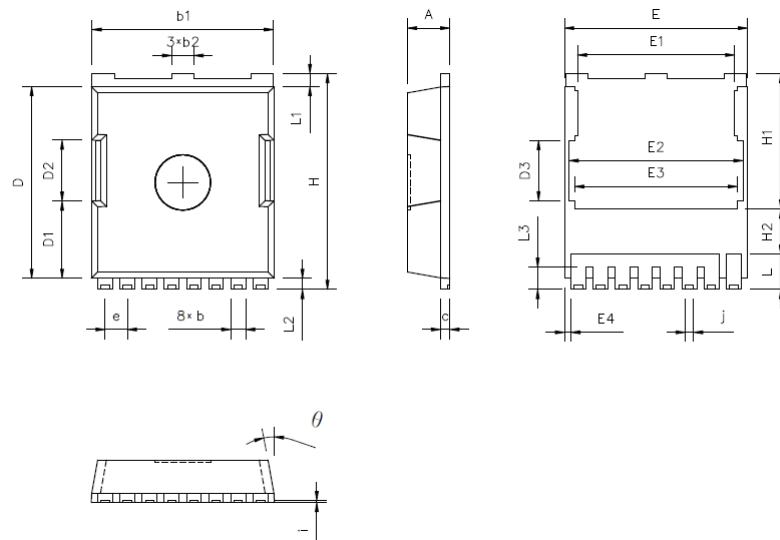
- (1) Package limited.
- (2) Pulse width limited by maximum junction temperature.
- (3) $V_{DS} = 75\text{ V}, V_{GS} = 10\text{ V}, L = 0.3\text{ mH}$.
- (4) $R_{\theta JA}$ is determined with the device mounted on a 1 in² pad 2 oz copper pad on a 1.5x1.5 in. board of FR-4 material.
- (5) Guaranteed by design, not subject to production testing.

Electrical characteristics diagrams

Fig.1 Typ. transfer characteristics

Fig.2 Typ. output characteristics

Fig.3 Normalized on-resistance vs drain current

Fig.4 Typ. on-resistance vs gate-source voltage

Fig.5 Normalized on-resistance vs junction temperature

Fig.6 Typ. gate charge


Electrical characteristics diagrams
Fig.7 Typ. forward characteristics of body diode

Fig.8 Safe operating area

Fig.9 Typ. Capacitance

Fig.10 Single pulse maximum power dissipation

Fig.11 Max. power dissipation vs case temperature

Fig.12 Max. continuous drain current vs case temperature


Electrical characteristics diagrams
Fig.13 Normalized $V_{(BR)DSS}$ vs junction temperature

Fig.14 Normalized $V_{GS(th)}$ vs junction temperature

Fig.15 Transient thermal impedance from junction to case


Package outline dimensions: TOLL


Dim	Millimeters		
	Min	Nom	Max
A	2.20	-	2.40
b	0.70	-	0.90
b1	9.70	-	9.90
b2	1.20 REF		
c	0.40	-	0.60
D	10.28	-	10.48
D1	4.08	-	4.28
D2	3.20	-	3.40
D3	3.16	-	3.36
E	9.80	-	10.00
E1	8.40	-	8.60
E2	9.30	-	9.50
E3	8.80 REF		
E4	0.25	-	0.45
e	1.20 BASIC		
H	11.58	-	11.78
H1	7.23	-	7.43
H2	2.45 REF		
i	0.10	-	-
j	0.45 REF		
L	1.60	-	2.10
L1	0.60	-	0.80
L2	0.50	-	0.70
L3	1.05	-	1.30
ø	10° REF		

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