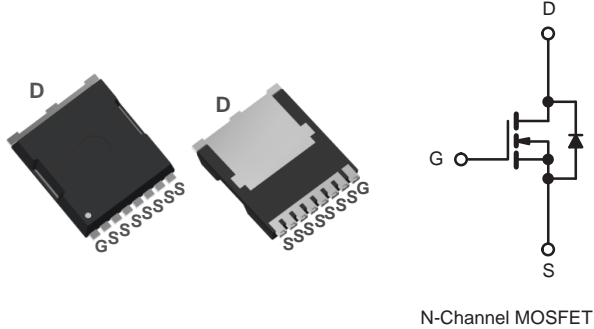


N-Channel 30 V (D-S) MOSFET

PRODUCT SUMMARY

V _{DS} (V)	R _{DS(on)} (mΩ) TYP.	I _D (A)	Q _g (TYP.)
30	0.6 at V _{GS} = 10 V	360	205 nC

TOLL Pin Configuration



FEATURES

- DT-Trench Power MOSFET
- 100 % R_g and UIS tested

APPLICATIONS

- Power supplies:
 - Uninterruptible power supplies
 - AC/DC switch-mode power supplies
 - Lighting
- Synchronous rectification
- DC/DC converter
- Motor drive switch
- DC/AC inverter
- Battery management



RoHS
COMPLIANT
HALOGEN
FREE

ABSOLUTE MAXIMUM RATINGS (T_C = 25 °C, unless otherwise noted)

PARAMETER	SYMBOL	LIMIT	UNIT
Drain-Source Voltage	V _{DS}	30	V
Gate-Source Voltage	V _{GS}	± 20	
Continuous Drain Current (T _J = 150 °C)	I _D	T _C = 25 °C	A
		T _C = 100 °C	
Pulsed Drain Current (t = 100 μs)	I _{DM}	1440	
Avalanche Current ^d	I _{AS}	125	mJ
Single Avalanche Energy ^a	E _{AS}	1258	
Maximum Power Dissipation ^a	P _D	T _C = 25 °C	W
		T _C = 100 °C	
Operating Junction and Storage Temperature Range	T _J , T _{stg}	-55 to +175	°C

THERMAL RESISTANCE RATINGS

PARAMETER	SYMBOL	LIMIT	UNIT
Junction-to-Ambient (PCB Mount) ^c	R _{thJA}	15	°C/W
Junction-to-Case (Drain)	R _{thJC}	0.5	

Notes

- Duty cycle ≤ 1 %.
- See SOA curve for voltage derating.
- When mounted on 1" square PCB (FR4 material).
- Single pulse width limited by junction temperature T_J(MAX)=150°C.

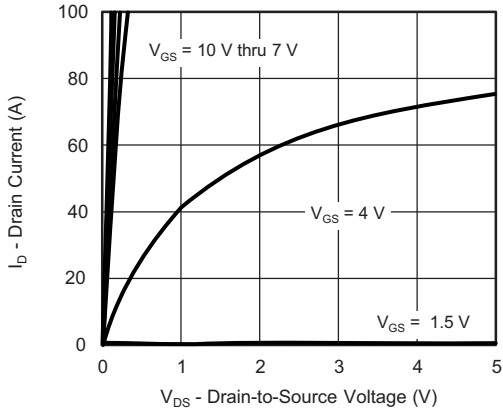
SPECIFICATIONS ($T_J = 25\text{ }^\circ\text{C}$, unless otherwise noted)						
PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Static						
Drain-Source Breakdown Voltage	V_{DS}	$V_{GS} = 0\text{ V}, I_D = 250\text{ }\mu\text{A}$	30	-	-	V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\text{ }\mu\text{A}$	1.5	-	3.5	
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}	$V_{DS} = 30\text{ V}, V_{GS} = 0\text{ V}$	-	-	1	μA
		$V_{DS} = 24\text{ V}, V_{GS} = 0\text{ V}, T_J = 85\text{ }^\circ\text{C}$	-	-	10	
On-State Drain Current ^a	$I_{D(on)}$	$V_{DS} \geq 10\text{ V}, V_{GS} = 10\text{ V}$	360	-	-	A
Drain-Source On-State Resistance ^a	$R_{DS(on)}$	$V_{GS} = 10\text{ V}, I_D = 50\text{ A}$	-	0.6	0.8	m Ω
		$V_{GS} = 4.5\text{ V}, I_D = 50\text{ A}$	-	0.98	1.3	
Forward Transconductance ^a	g_{fs}	$V_{DS} = 10\text{ V}, I_D = 50\text{ A}$	-	123	-	S
Dynamic ^b						
Input Capacitance	C_{iss}	$V_{GS} = 0\text{ V}, V_{DS} = 15\text{ V}, f = 1\text{ MHz}$	-	14500	-	pF
Output Capacitance	C_{oss}		-	2680	-	
Reverse Transfer Capacitance	C_{rss}		-	778	-	
Total Gate Charge ^c	Q_g	$V_{DS} = 15\text{ V}, V_{GS} = 10\text{ V}, I_D = 50\text{ A}$	-	205	-	nC
Gate-Source Charge ^c	Q_{gs}		-	43	-	
Gate-Drain Charge ^c	Q_{gd}		-	37	-	
Gate Resistance	R_g	$f = 1\text{ MHz}$	-	2.8	-	Ω
Turn-On Delay Time ^c	$t_{d(on)}$	$V_{DD} = 15\text{ V}, I_D = 50\text{ A}, R_g = 3\text{ }\Omega$ $V_{GEN} = 10\text{ V}$	-	49	-	ns
Rise Time ^c	t_r		-	56	-	
Turn-Off Delay Time ^c	$t_{d(off)}$		-	166	-	
Fall Time ^c	t_f		-	72	-	
Drain-Source Body Diode Ratings and Characteristics ^b ($T_C = 25\text{ }^\circ\text{C}$)						
Continuous Source-Drain Diode Current	I_S	$T_C = 25\text{ }^\circ\text{C}$	-	-	360	A
Pulsed Current ($t = 100\text{ }\mu\text{s}$)	I_{SM}		-	-	1440	A
Forward Voltage ^a	V_{SD}	$I_F = 1\text{ A}, V_{GS} = 0\text{ V}$	-	-	1	V
Reverse Recovery Time	t_{rr}	$I_F = 50\text{ A}, di/dt = 500\text{ A}/\mu\text{s}$	-	58	-	ns
Reverse Recovery Charge	Q_{rr}		-	185	-	nC

Notes

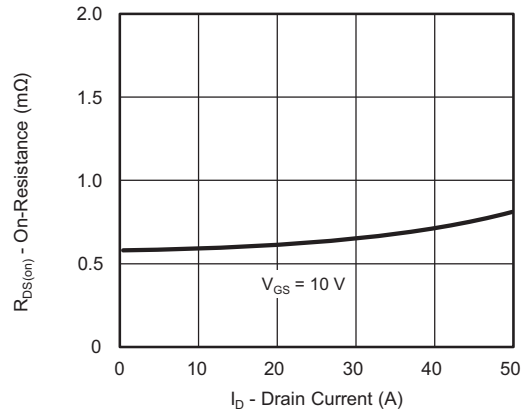
- a. Pulse test; pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$.
 b. Guaranteed by design, not subject to production testing.
 c. Independent of operating temperature.

Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

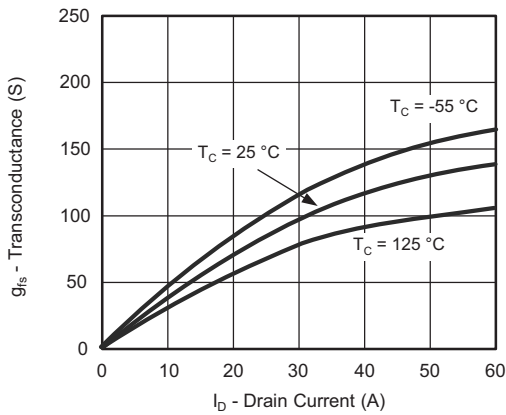
TYPICAL CHARACTERISTICS ($T_A = 25\text{ }^\circ\text{C}$, unless otherwise noted)



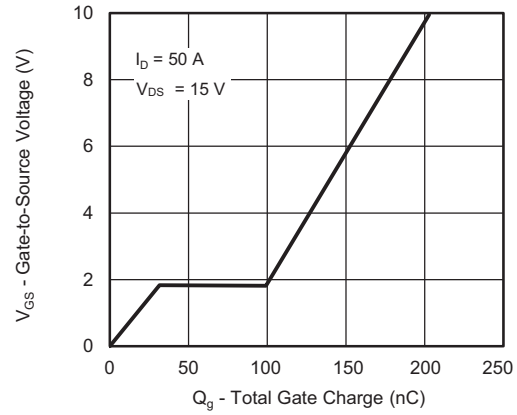
Output Characteristics



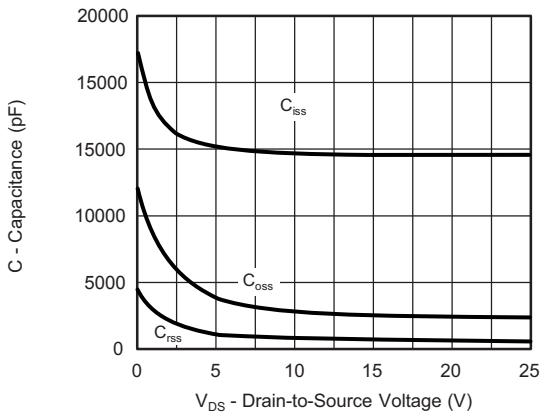
On-Resistance vs. Drain Current



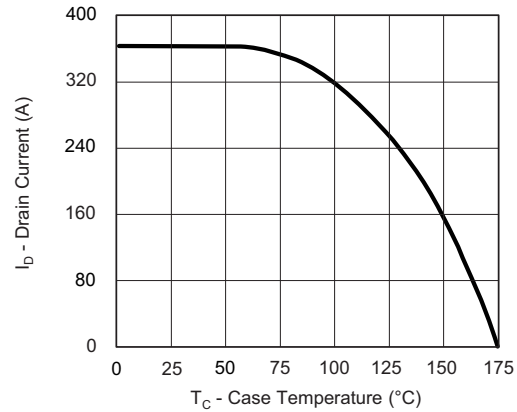
Transconductance



Gate Charge

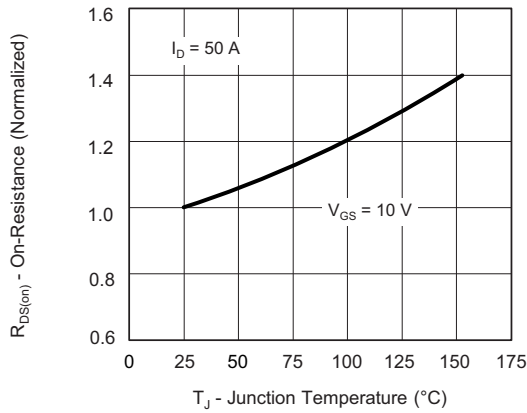


Capacitance

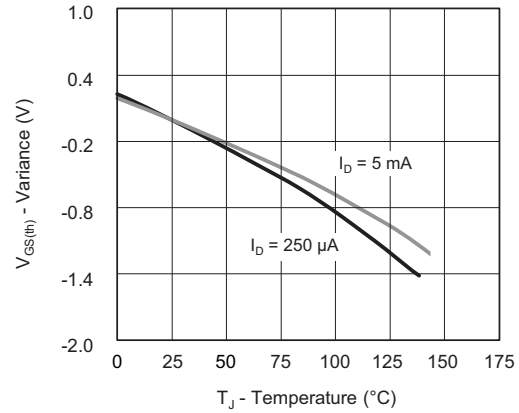


Current De-Rating

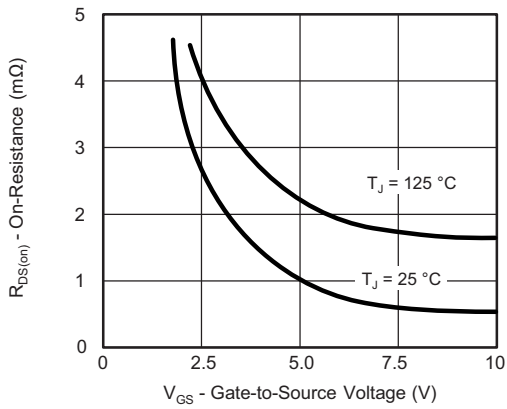
TYPICAL CHARACTERISTICS ($T_A = 25\text{ }^\circ\text{C}$, unless otherwise noted)



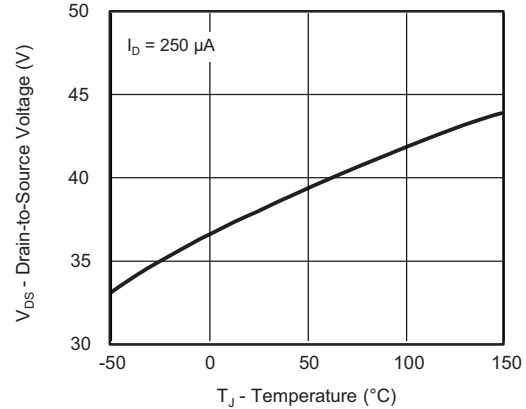
On-Resistance vs. Junction Temperature



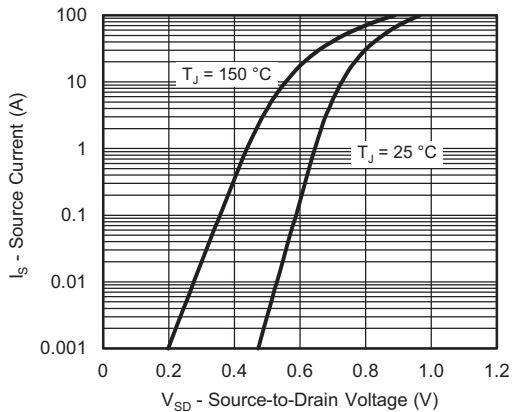
Threshold Voltage



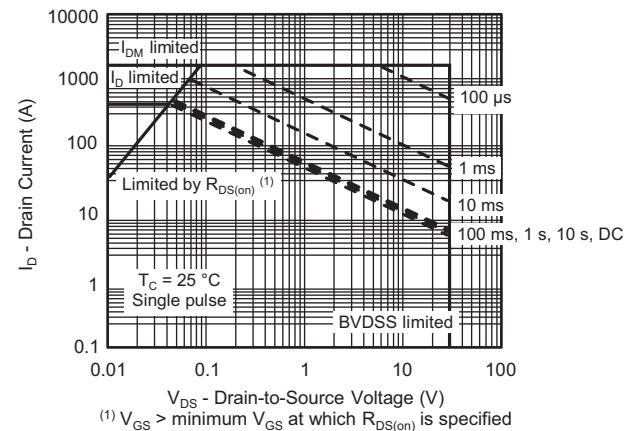
On-Resistance vs. Gate-to-Source Voltage



Drain Source Breakdown vs. Junction Temperature

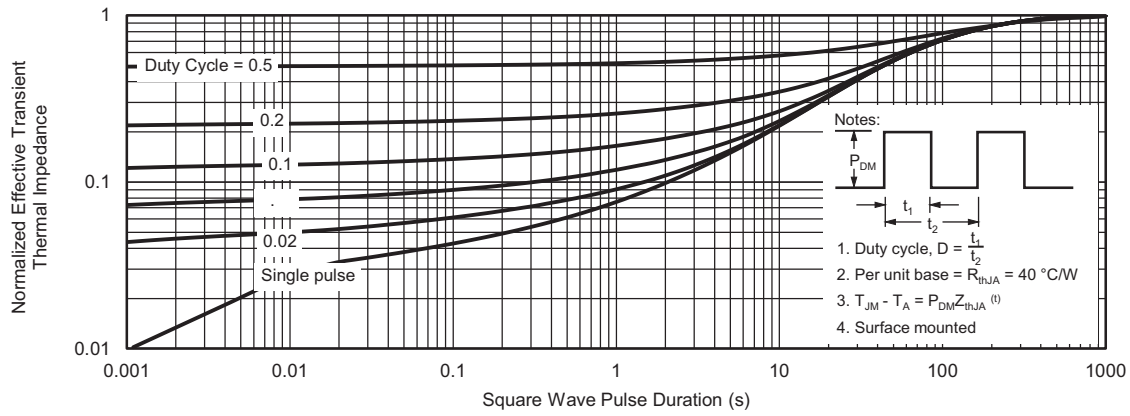


Source Drain Diode Forward Voltage



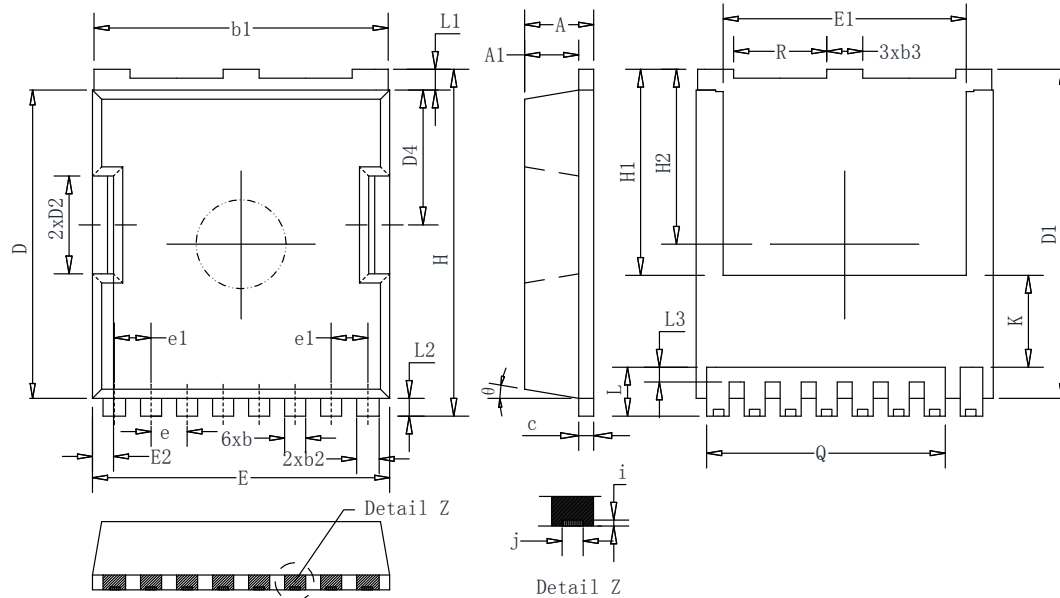
Safe Operating Area

THERMAL RATINGS ($T_A = 25\text{ }^\circ\text{C}$, unless otherwise noted)



Normalized Thermal Transient Impedance, Junction-to-Ambient

TOLL PACKAGE OUTLINE



COMMON DIMENSIONS
(UNITS OF MEASURE=MILLIMETER)

Symbol	Min	Typ	Max	Symbol	Min	Typ	Max
A	2.05	2.30	2.65	E2	0.40	0.70	0.90
A1	1.50	1.80	2.10	H	11.30	11.70	12.10
b	0.50	0.70	0.90	H1	6.95 BSC		
b1	9.50	9.80	10.05	H2	5.90 BSC		
b2	0.50	0.75	1.00	i	0.10 REF		
b3	1.00	1.20	1.45	j	0.35 REF		
c	0.30	0.50	0.75	K	3.10 REF		
D	10.10	10.40	10.70	L	1.45	1.65	1.85
D1	10.80	11.10	11.40	L1	0.50	0.70	0.90
D2	3.10	3.30	3.50	L2	0.40	0.60	0.80
D4	4.35	4.55	4.80	L3	0.30	0.50	0.70
e	1.20 BSC			Q	7.95 REF		
e1	1.225 BSC			R	2.80	3.10	3.35
E	9.65	9.90	10.15	θ	10°REF		
E1	7.80	8.10	8.50				

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