

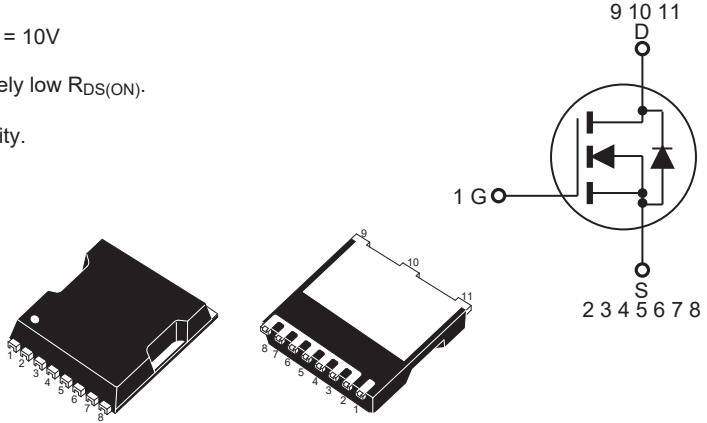
N-Channel Enhancement Mode Field Effect Transistor

FEATURES

- 120V , 277A, $R_{DS(ON)} = 2.7m\Omega$ @ $V_{GS} = 10V$
- Super high dense cell design for extremely low $R_{DS(ON)}$.
- High power and current handling capability.
- RoHS compliant.
- TOLL package.

Applications

- Battery management.
- Load switch.
- Solar.



ABSOLUTE MAXIMUM RATINGS $T_C = 25^\circ C$ unless otherwise noted

Parameter	Symbol	Limit	Units
Drain-Source Voltage	V_{DS}	120	V
Gate-Source Voltage	V_{GS}	± 20	V
Drain Current-Continuous @ $T_C = 25^\circ C$ @ $T_C = 100^\circ C$	I_D	277	A
		196	A
Drain Current-Pulsed ^a	I_{DM}	1108	A
Maximum Power Dissipation @ $T_C = 25^\circ C$ - Derate above $25^\circ C$	P_D	416	W
		2.7	W/ $^\circ C$
Single Pulsed Avalanche Energy ^d	E_{AS}	1332	mJ
Single Pulsed Avalanche Current ^d	I_{AS}	73	A
Operating and Store Temperature Range	T_J, T_{stg}	-55 to 175	$^\circ C$

Thermal Characteristics

Parameter	Symbol	Limit	Units
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	0.36	$^\circ C/W$
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	60	$^\circ C/W$

Electrical Characteristics $T_C = 25^\circ\text{C}$ unless otherwise noted

Parameter	Symbol	Test Condition	Min	Typ	Max	Units
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS} = 0V, I_D = 250\mu A$	120			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 120V, V_{GS} = 0V$			1	μA
Gate Body Leakage Current, Forward	I_{GSSF}	$V_{GS} = 20V, V_{DS} = 0V$			100	nA
Gate Body Leakage Current, Reverse	I_{GSSR}	$V_{GS} = -20V, V_{DS} = 0V$			-100	nA
On Characteristics^b						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{GS} = V_{DS}, I_D = 250\mu A$	2		4	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 20A$		2.1	2.7	m Ω
Gate input resistance	R_g	f=1MHz, open Drain		2		Ω
Dynamic Characteristics^c						
Input Capacitance	C_{iss}	$V_{DS} = 50V, V_{GS} = 0V,$ $f = 1.0\text{ MHz}$		5290		pF
Output Capacitance	C_{oss}			1605		pF
Reverse Transfer Capacitance	C_{rss}			280		pF
Switching Characteristics^c						
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = 50V, I_D = 20A,$ $V_{GS} = 10V, R_{GEN} = 4.5\Omega$		59		ns
Turn-On Rise Time	t_r			77		ns
Turn-Off Delay Time	$t_{d(off)}$			114		ns
Turn-Off Fall Time	t_f			79		ns
Total Gate Charge	Q_g	$V_{DS} = 50V, I_D = 20A,$ $V_{GS} = 10V$		173		nC
Gate-Source Charge	Q_{gs}			41		nC
Gate-Drain Charge	Q_{gd}			73		nC
Drain-Source Diode Characteristics and Maximum Ratings						
Drain-Source Diode Forward Current	I_S				277	A
Drain-Source Diode Forward Voltage ^b	V_{SD}	$V_{GS} = 0V, I_S = 20A$			1.2	V
Reverse Recovery Time	T_{rr}	$I_F = 50A, di/dt = 100A/\mu s$		142		ns
Reverse Recovery Charge	Q_{rr}			468		nC
Notes : a.Repetitive Rating : Pulse width limited by maximum junction temperature b.Pulse Test : Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$. c.Guaranteed by design, not subject to production testing. d.L = 0.5mH, $I_{AS} = 73A, V_{DD} = 50V, R_G = 25\Omega$, Starting $T_J = 25^\circ\text{C}$.						

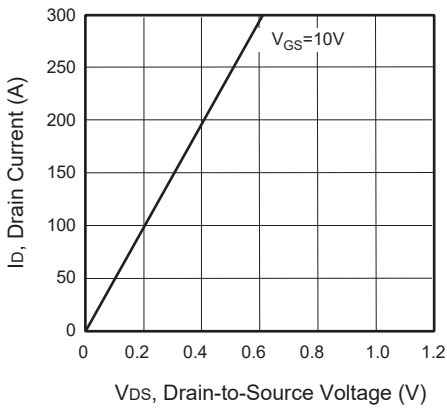


Figure 1. Output Characteristics

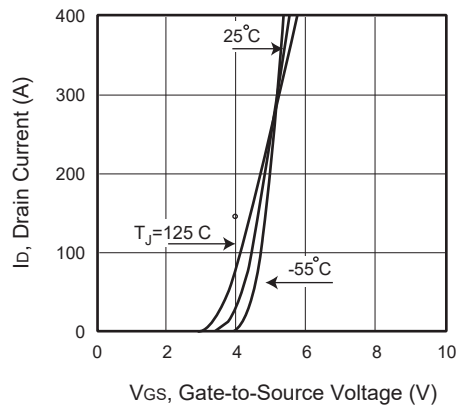


Figure 2. Transfer Characteristics

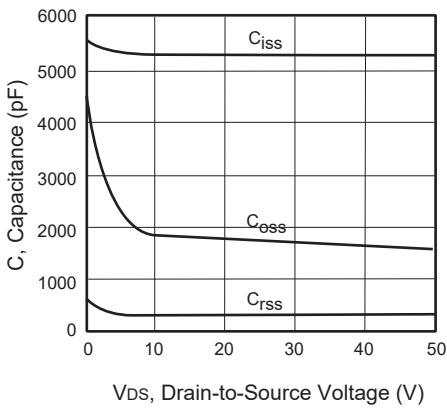


Figure 3. Capacitance

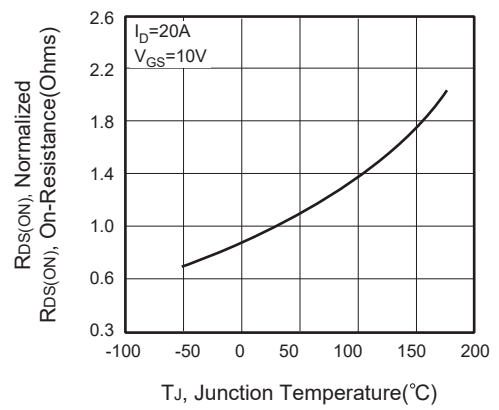


Figure 4. On-Resistance Variation with Temperature

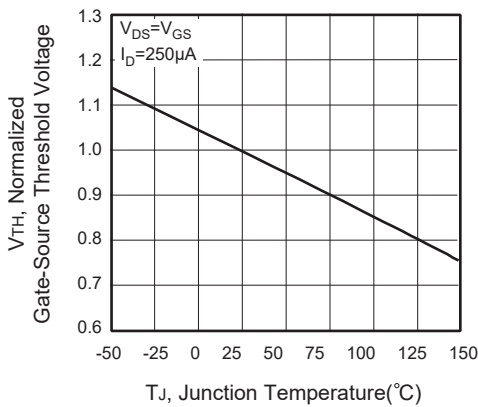


Figure 5. Gate Threshold Variation with Temperature

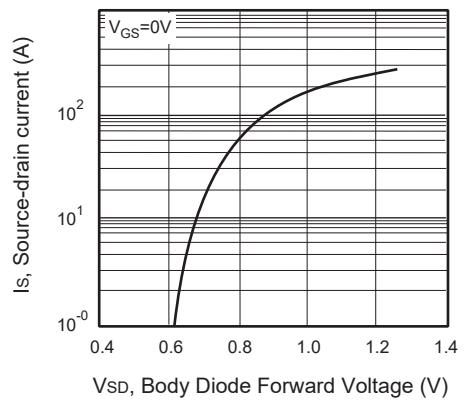


Figure 6. Body Diode Forward Voltage Variation with Source Current

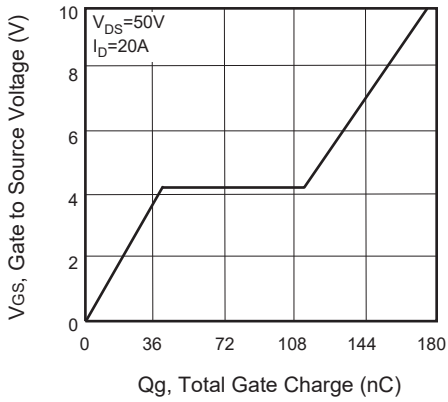


Figure 7. Gate Charge

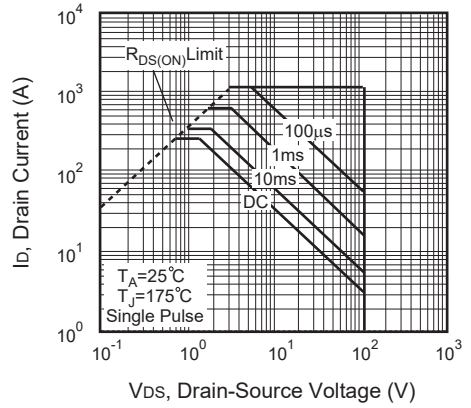


Figure 8. Maximum Safe Operating Area

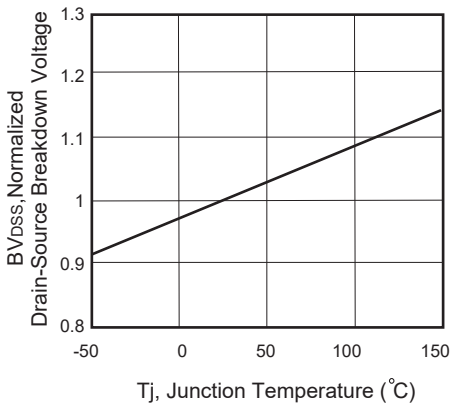


Figure 9. Breakdown Voltage Variation VS Temperature

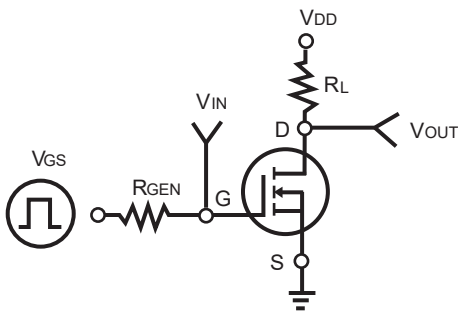


Figure 10. Switching Test Circuit

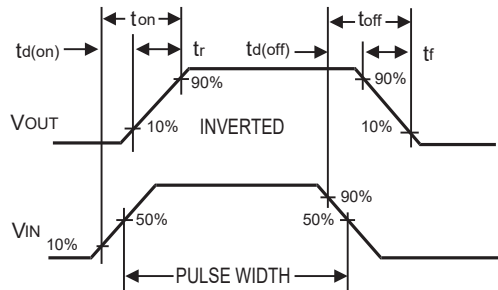


Figure 11. Switching Waveforms

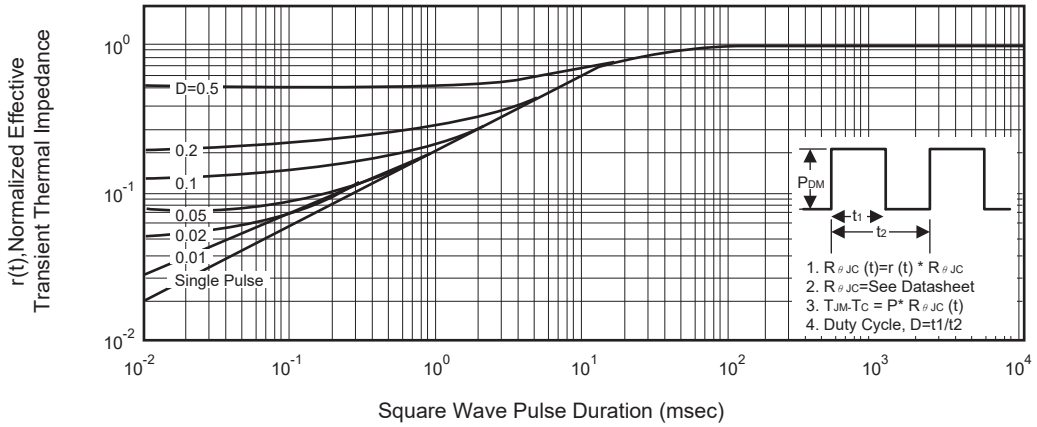
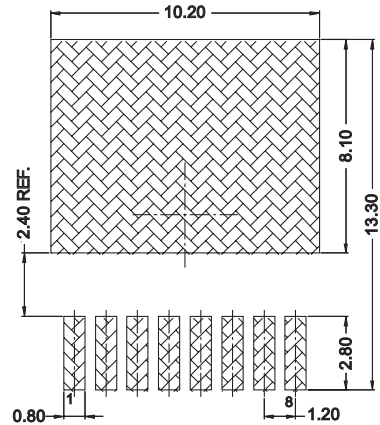
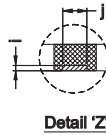
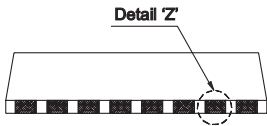
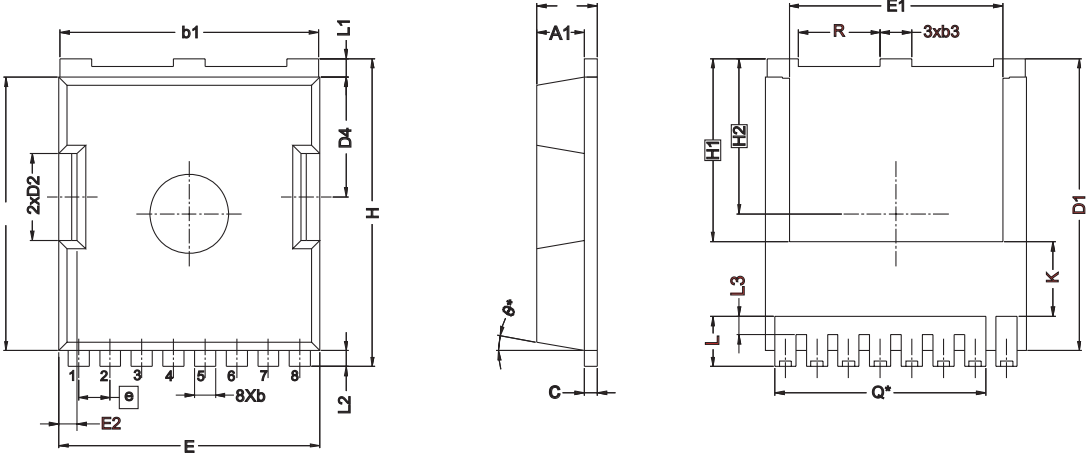


Figure 12. Normalized Thermal Transient Impedance Curve

TOLL 產品外觀尺寸圖(Product Outline Dimension)



Land Pattern
(Only For Reference)

- NOTE :
- 1.REFER TO JEDEC MO-299B.
 - 2.ALL DIMENSIONS ARE IN mm, ANGLES DEGREES.
 - 3.DIMENSIONS DO NOT INCLUSIVE BURRS AND MOLD FLASH.
 - 4.** IS FOR REFERENCE.

SYMBOLS	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	2.200	2.400	0.087	0.094
A1	1.700	1.900	0.067	0.075
b	0.700	0.900	0.028	0.035
b1	9.700	9.900	0.382	0.390
b3	1.100	1.300	0.043	0.051
c	0.400	0.600	0.016	0.024
D	10.280	10.480	0.405	0.413
D1	10.980	11.180	0.432	0.440
D2	3.200	3.400	0.126	0.134
D4	4.450	4.650	0.175	0.183
E	9.800	10.000	0.386	0.394
E1	8.000	8.200	0.315	0.323
E2	0.600	0.800	0.024	0.031
e	1.20BSC		0.047BSC	
H	11.580	11.780	0.456	0.464
H1	6.95BSC		0.274BSC	
H2	5.89BSC		0.232BSC	
i	0.10REF		0.004REF	
j	0.46REF		0.018REF	
K	2.80REF		0.110REF	
L	1.400	2.100	0.055	0.083
L1	0.600	0.800	0.024	0.031
L2	0.500	0.700	0.020	0.028
L3	0.300	0.800	0.012	0.031
N	8.000		0.315	
Q	8.00REF		0.315REF	
R	3.000	3.200	0.118	0.126
θ	10°REF		10°REF	