TM15N10D

N-Channel Enhancement Mosfet

General Description

- Low $R_{DS(ON)}$
- RoHS and Halogen-Free Compliant

Applications

- Load switch
- PWM

General Features

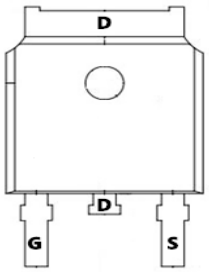
V_{DS} =100V I_D = 15A

$R_{DS(ON)}$= 75mΩ(typ.) @ V_{GS}= 10V

100% UIS Tested

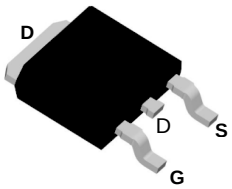
100% R_g Tested

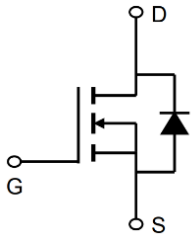
Green Product



Marking:15N10

D:TO-252-3L





ABSOLUTE MAXIMUM RATINGS (T_A = 25℃ Unless otherwise noted)

Symbol	Parameter		Rating	Unit
Common Ratings (T_A=25°C Unless Otherwise Noted)				
V_{DSS}	Drain-Source Voltage		100	V
V_{GSS}	Gate-Source Voltage		±20	
T_J	Maximum Junction Temperature		175	°C
T_{STG}	Storage Temperature Range		-55 to 175	°C
I_S	Diode Continuous Forward Current		15	A
I_{DP}	300μs Pulse Drain Current Tested	T_C=25°C	64	A
		T_C=100°C	44	
I_D	Continuous Drain Current	T_C=25°C	15	A
		T_C=100°C	11	
P_D	Maximum Power Dissipation	T_C=25°C	60	W
		T_C=100°C	30	
$R_{\theta JC}$	Thermal Resistance-Junction to Case		2.5	°C/W
$R_{\theta JA}$	Thermal Resistance-Junction to Ambient		50	°C/W
E_{AS}	Avalanche Energy, Single Pulsed (L=0.3mH)		30	mJ

Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged. Absolute maximum ratings are stress rating only and functional device operation is not implied

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ELECTRICAL CHARACTERISTICS(T_A=25℃ Unless otherwise noted)

Symbol	Parameter	Test Conditions	UT15N10			Unit
			Min.	Typ.	Max.	
Static Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V, I_{DS}=250μA	100	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=80V, V_{GS}=0V	-	-	1	μA
		T_J=85°C	-	-	30	
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_{DS}=250μA	0.5	1.5	2.5	V
I_{GSS}	Gate Leakage Current	V_{GS}=±16V, V_{DS}=0V	-	-	±10	μA
$R_{DS(ON)}$ [a]	Drain-Source On-state Resistance	V_{GS}=10V, I_{DS}=15A	-	75	96	mΩ
		V_{GS}=4.5V, I_{DS}=8A	-	97	130	
Diode Characteristics						
V_{SD} [a]	Diode Forward Voltage	I_{SD}=5A, V_{GS}=0V	0.6	0.8	1.1	V
t_{rr}	Reverse Recovery Time	I_{DS}=5A, dI_{SD}/dt=100A/μs	33	47	61	ns
Q_{rr}	Reverse Recovery Charge		61	87	113	nC
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{GS}=0V, V_{DS}=30V, Frequency=1.0MHz	730	940	1250	pF
C_{oss}	Output Capacitance		45	80	115	
C_{rss}	Reverse Transfer Capacitance		25	50	75	
$t_{d(ON)}$	Turn-on Delay Time	V_{DD}=30V, R_L=30Ω, I_{DS}=1A, V_{GEN}=10V, R_G=6Ω	-	13	24	ns
t_r	Turn-on Rise Time		-	10	19	
$t_{d(OFF)}$	Turn-off Delay Time		-	32	60	
t_f	Turn-off Fall Time		-	16	30	
Gate Charge Characteristics [b]						
Q_g	Total Gate Charge	V_{DS}=50V, V_{GS}=10V, I_{DS}=5A	12	21	30	nC
Q_{gs}	Gate-Source Charge		3.4	4.9	6.4	
Q_{gd}	Gate-Drain Charge		2.9	5.8	8.7	

Note a : Pulse test ; pulse width≤300μs, duty cycle≤2%.
Note b : Guaranteed by design, not subject to production testing.

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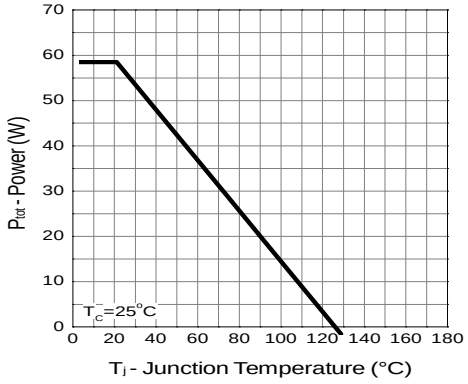
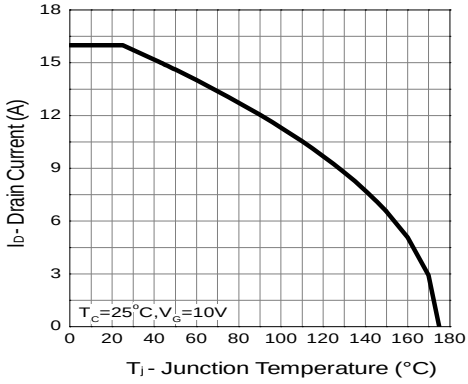
TYPICAL CHARACTERISTICS (25℃ Unless Note)

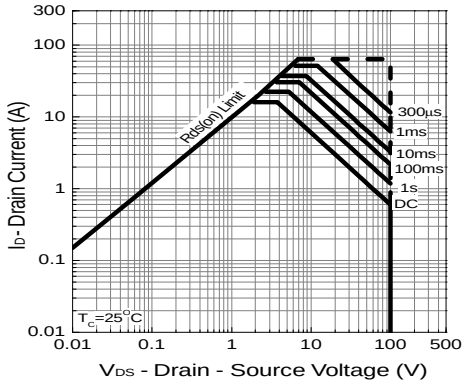
Power Dissipation



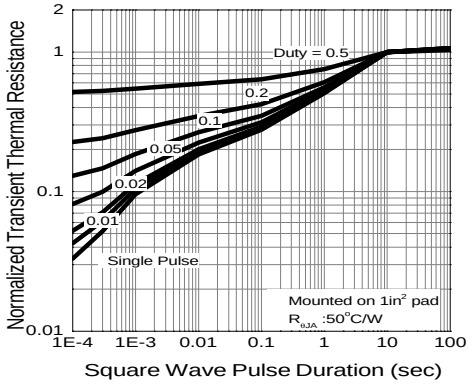
Drain Current



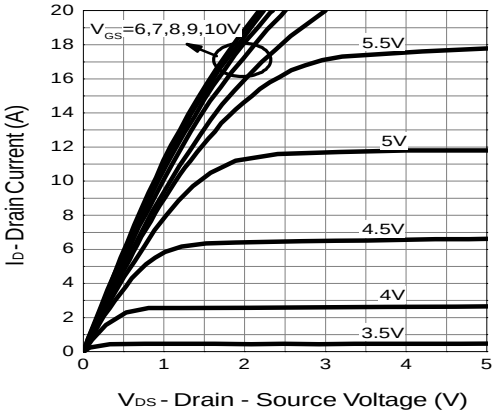
Safe Operation Area



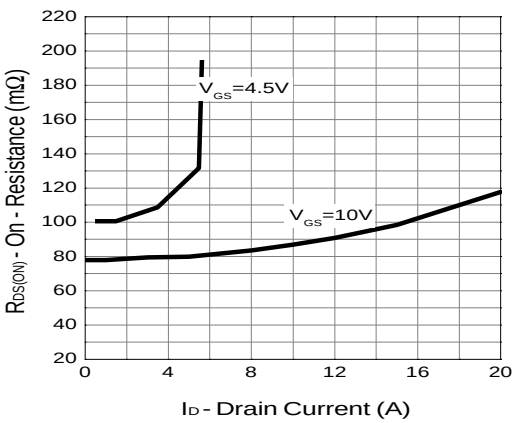
Thermal Transient Impedance



Output Characteristics



Drain-Source On Resistance



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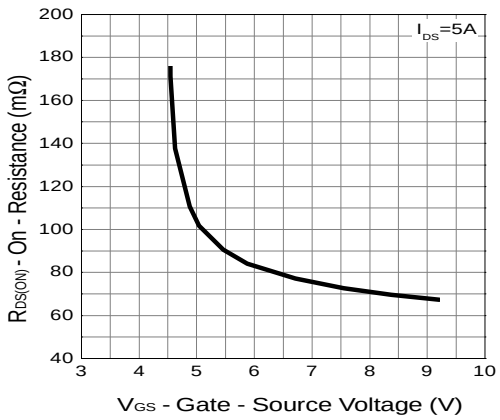
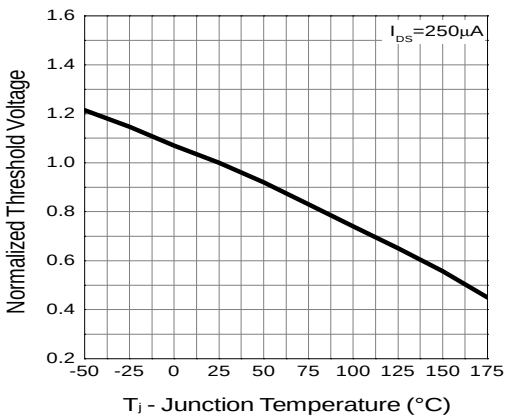
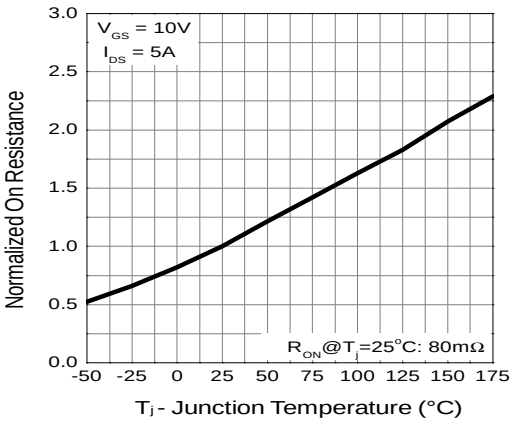
Gate-Source On Resistance



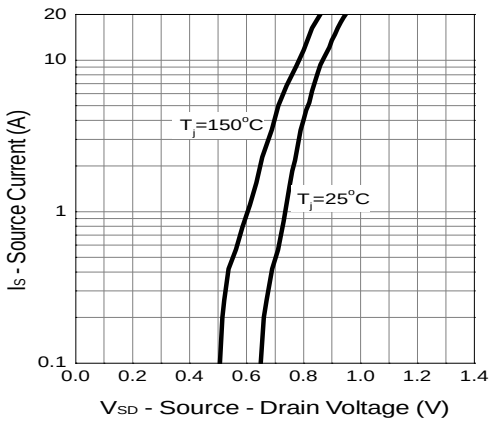
Gate Threshold Voltage



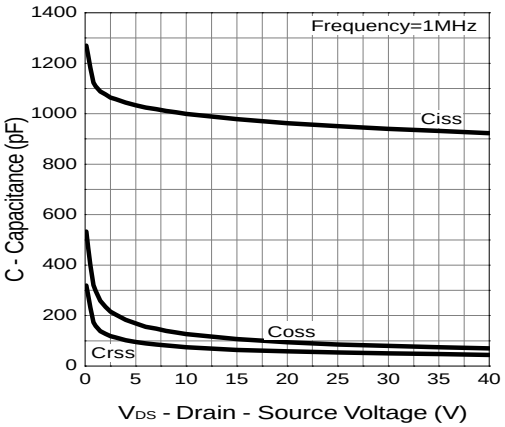
Drain-Source On Resistance



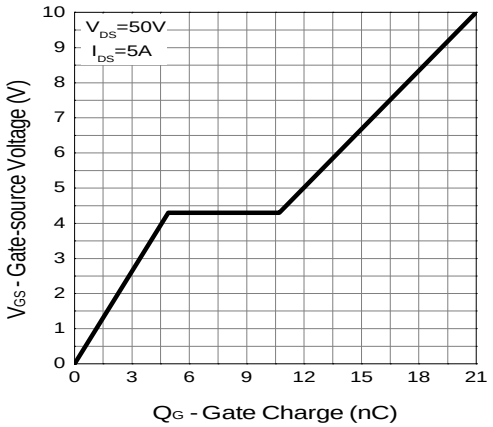
Source-Drain Diode Forward



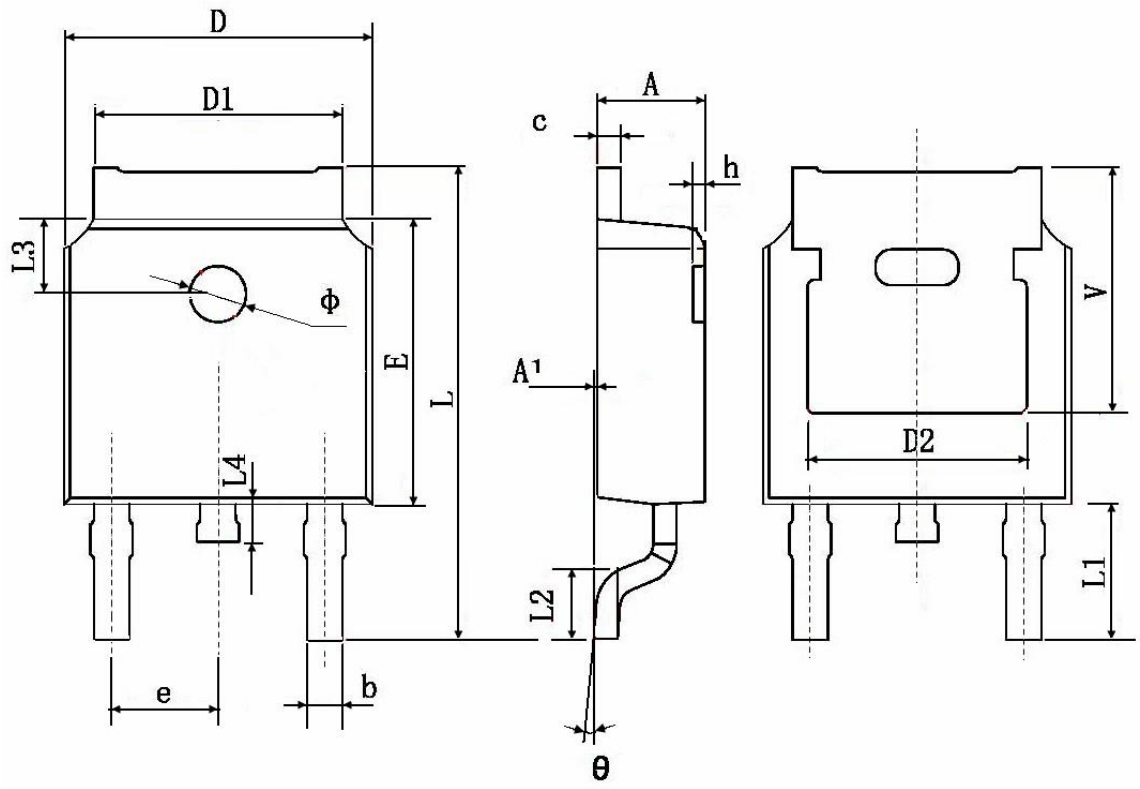
Capacitance



Gate Charge



Package Information : TO-252-3L



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.200	2.400	0.087	0.094
A1	0.000	0.127	0.000	0.005
b	0.660	0.860	0.026	0.034
c	0.460	0.580	0.018	0.023
D	6.500	6.700	0.256	0.264
D1	5.100	5.460	0.201	0.215
D2	4.830 TYP.		0.190 TYP.	
E	6.000	6.200	0.236	0.244
e	2.186	2.386	0.086	0.094
L	9.800	10.400	0.386	0.409
L1	2.900 TYP.		0.114 TYP.	
L2	1.400	1.700	0.055	0.067
L3	1.600 TYP.		0.063 TYP.	
L4	0.600	1.000	0.024	0.039
Φ	1.100	1.300	0.043	0.051
θ	0°	8°	0°	8°
h	0.000	0.300	0.000	0.012
V	5.350 TYP.		0.211 TYP.	