



### Features

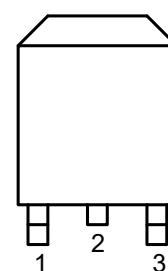
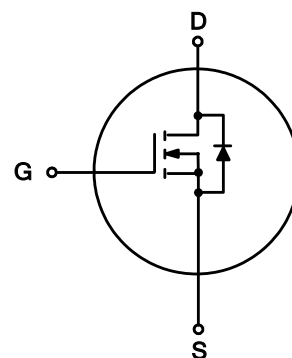
- Low On-Resistance
- Fast Switching Speed
- 100% avalanche tested
- Lead Free and Green Devices  
Available (RoHS Compliant)

### Application

- DC/DC Converters
- On board power for server
- Synchronous rectification

### Product Summary

V <sub>DSS</sub>	40	V
R <sub>DS(ON)</sub> -Typ@V <sub>GS</sub> =10V	2.3	mΩ
I <sub>D</sub>	120	A



**Top View**  
**TO-252**

Symbol	Parameter	Conditions	Min	Max	Unit
V <sub>DS</sub>	Drain-Source Voltage	T <sub>C</sub> = 25 °C	-	40	V
V <sub>GS</sub>	Gate-Source Voltage	T <sub>C</sub> = 25 °C	-	±20	V
I <sub>D</sub> ****	Drain Current ( DC )	T <sub>C</sub> = 25 °C, V <sub>GS</sub> = 10 V	-	120	A
		T <sub>C</sub> = 100 °C, V <sub>GS</sub> = 10 V	-	101	A
I <sub>DM</sub> *	Drain Current ( Pulsed )	T <sub>C</sub> = 25 °C, V <sub>GS</sub> = 10 V	-	480	A
P <sub>tot</sub>	Drain power dissipation	T <sub>C</sub> = 25 °C	-	104	W
T <sub>stg</sub>	Storage Temperature		-55	150	°C
T <sub>J</sub>	Junction Temperature		-	150	°C
I <sub>S</sub>	Continuous-Source Current	T <sub>C</sub> = 25 °C	-	60	A
I <sub>AS</sub>	Single Pulsed Avalanche Current	V <sub>DD</sub> =40V, L=0.1mH	-	55	A
E <sub>AS</sub>	Single Pulsed Avalanche Energy	V <sub>DD</sub> =40V, L=1.0mH	-	338	mJ
R <sub>θJA</sub> **	Thermal Resistance- Junction to Ambient		-	46	°C/W
R <sub>θJC</sub> **	Thermal Resistance- Junction to Case		-	1.2	

Notes :

- \* Pulse width ≤ 300 μs, duty cycle ≤ 2 %
- \*\* Surface Mounted on 1 in<sup>2</sup> pad area, t ≤ 10 sec
- \*\*\* Limited by bonding wire


**Electrical Characteristics** ( $T_A = 25\text{ }^\circ\text{C}$  Unless Otherwise Noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
<b>Static Characteristics</b>						
$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS} = 0\text{ V}, I_{DS} = 250\text{ }\mu\text{A}$	40	-	-	V
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS} = V_{GS}, I_{DS} = 250\text{ }\mu\text{A}$	1	-	2	V
$I_{DSS}$	Drain Leakage Current	$V_{DS} = 32\text{ V}, V_{GS} = 0\text{ V}$	-	-	1	$\mu\text{A}$
$I_{GSS}$	Gate Leakage Current	$V_{GS} = 0\text{ V}, V_{GS} = \pm 20\text{ V}$	-	-	$\pm 100$	nA
$R_{DS(on)}^a$	On-State Resistance	$V_{GS} = 10\text{ V}, I_{DS} = 20\text{ A}$	-	2.1	2.3	m $\Omega$
		$V_{GS} = 4.5\text{ V}, I_{DS} = 10\text{ A}$	-	3.0	3.5	
<b>Diode Characteristics</b>						
$V_{SD}^a$	Diode Forward Voltage	$I_{SD} = 20\text{ A}, V_{GS} = 0\text{ V}$	-	-	1.3	V
$t_{rr}$	Reverse Recovery Time	$I_{DS} = 20\text{ A}, V_{GS} = 0\text{ V}$ $dI_{SD}/dt = 100\text{ A}/\mu\text{s}$	-	17	-	nS
$Q_{rr}$	Reverse Recovery Charge		-	22	-	nC
<b>Dynamic Characteristics<sup>b</sup></b>						
$C_{iss}$	Input Capacitance	$V_{GS} = 0\text{ V}, V_{DS} = 20\text{ V}$ Frequency = 1 MHz	-	2294	-	pF
$C_{oss}$	Output Capacitance		-	885	-	
$C_{riss}$	Reverse Transfer Capacitance		-	90	-	
$t_{d(on)}$	Turn-on Delay Time	$V_{DS} = 20\text{ V}, V_{GEN} = 10\text{ V},$ $R_G = 3.9\text{ }\Omega, R_L = 1\text{ }\Omega,$ $I_{DS} = 20\text{ A}$	-	10	-	nS
$t_r$	Turn-on Rise Time		-	57	-	
$t_{d(off)}$	Turn-off Delay Time		-	50	-	
$t_f$	Turn-off Fall Time		-	81	-	
<b>Gate Charge Characteristics<sup>b</sup></b>						
$Q_g$	Total Gate Charge	$V_{DS} = 20\text{ V}, V_{GS} = 10\text{ V},$ $I_{DS} = 20\text{ A}$	-	48	-	nC
$Q_{gs}$	Gate-Source Charge		-	8	-	
$Q_{gd}$	Gate-Drain Charge		-	9	-	

**Notes :**

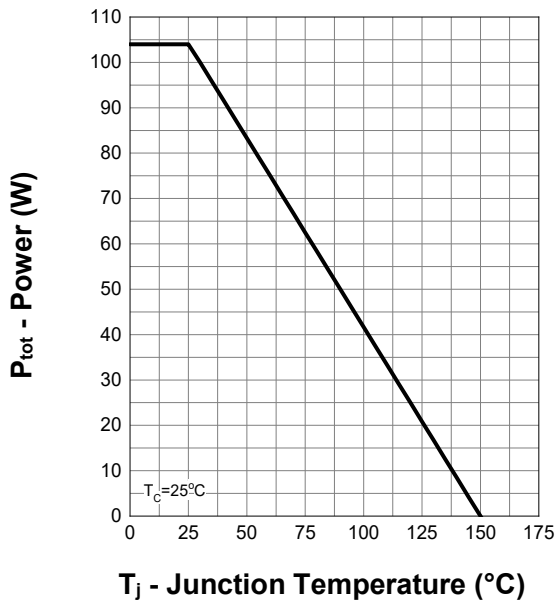
 a : Pulse test ; pulse width  $\leq 300\text{ }\mu\text{s}$ , duty cycle  $\leq 2\%$ 

b : Guaranteed by design, not subject to production testing

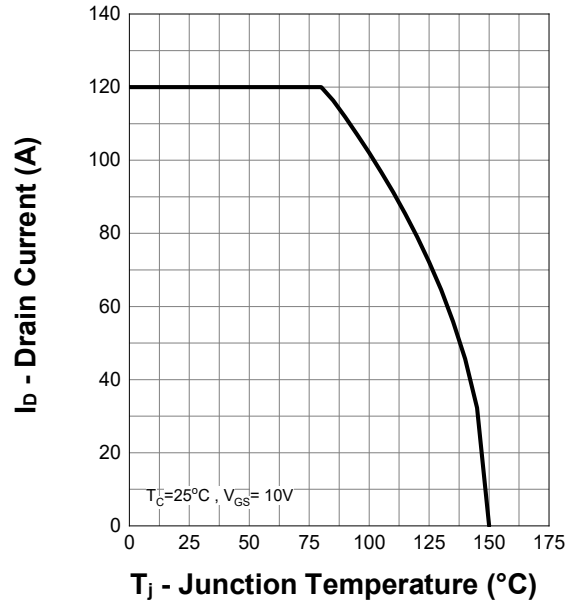


### Typical Characteristics

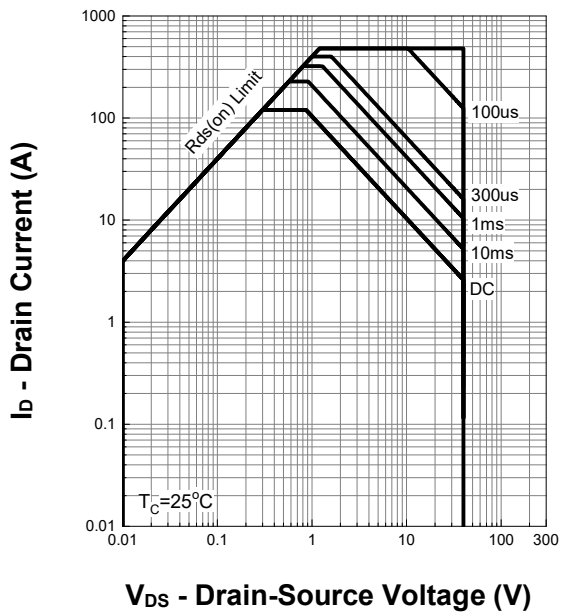
#### Power Capability



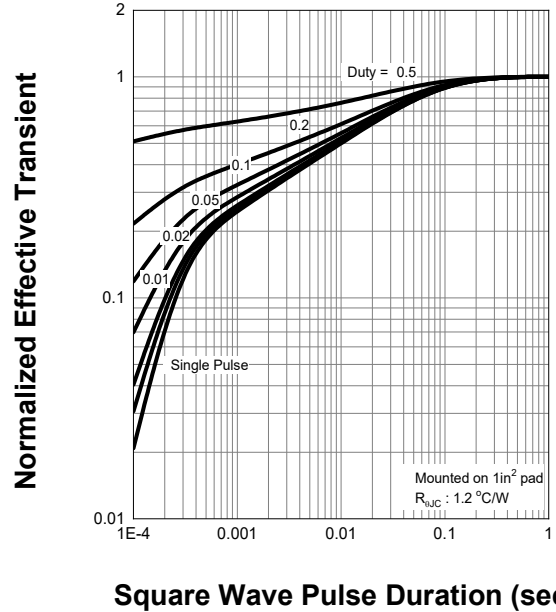
#### Current Capability



#### Safe Operating Area



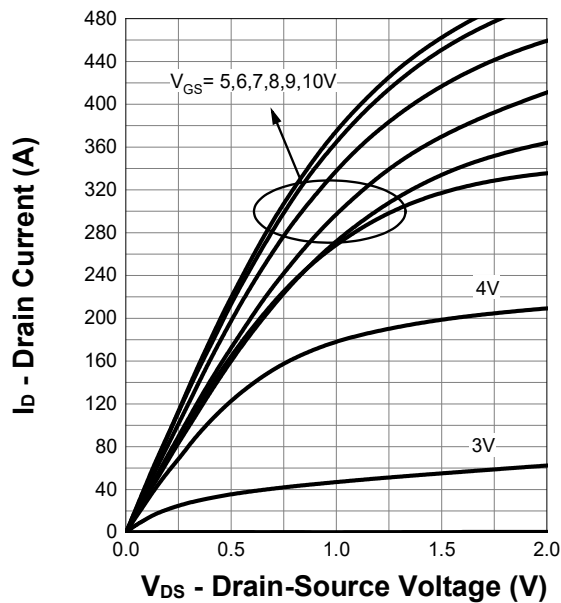
#### Transient Thermal Impedance



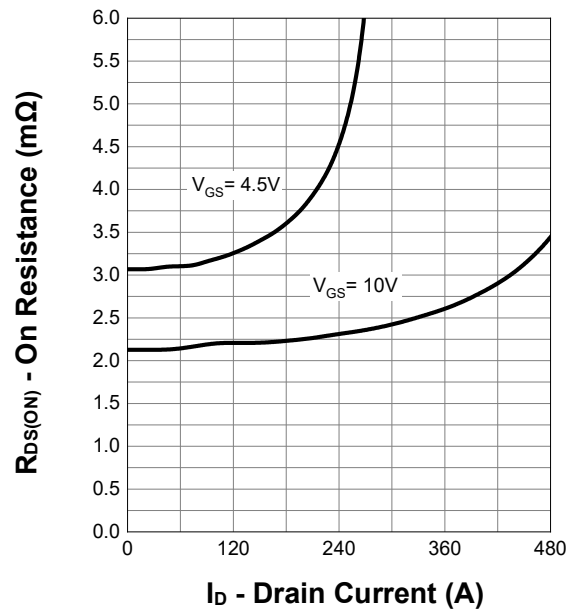


### Typical Characteristics (cont.)

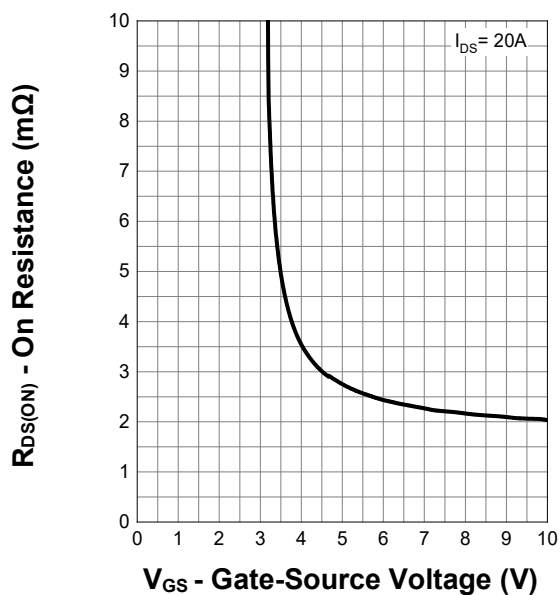
#### Output Characteristics



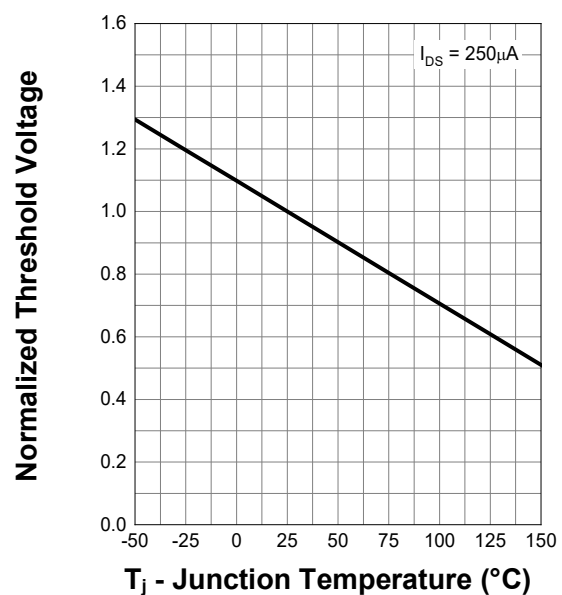
#### On Resistance



#### Transfer Characteristics

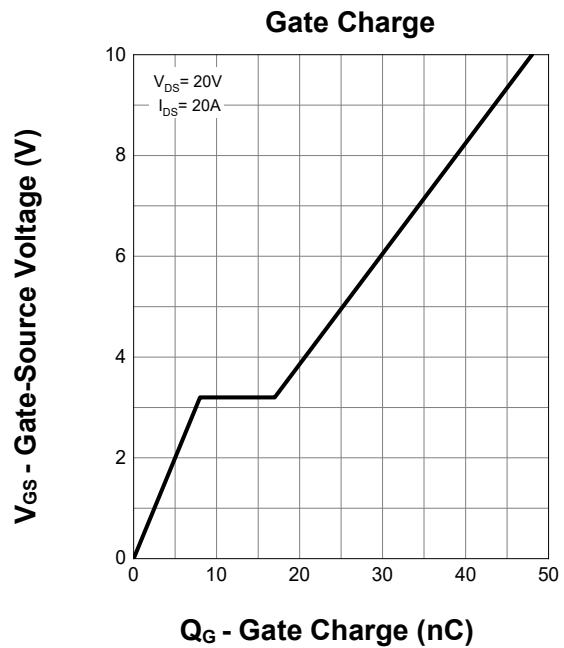
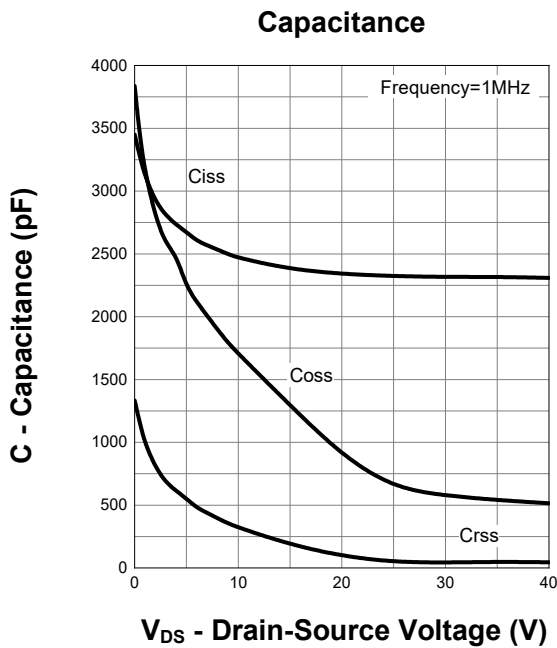
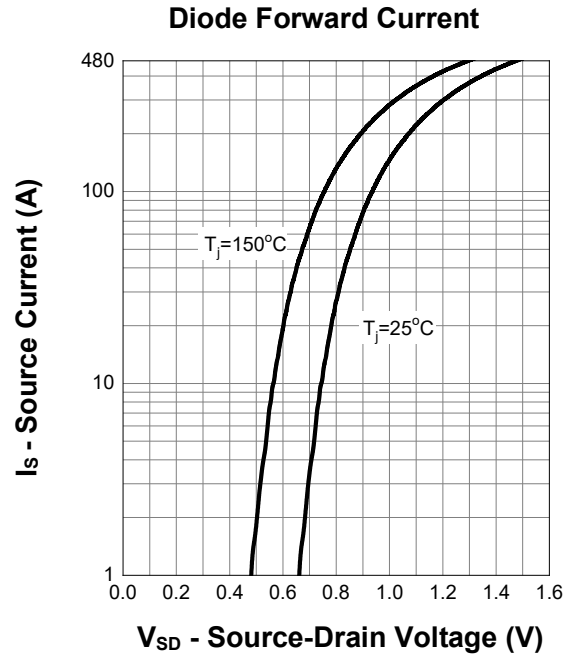
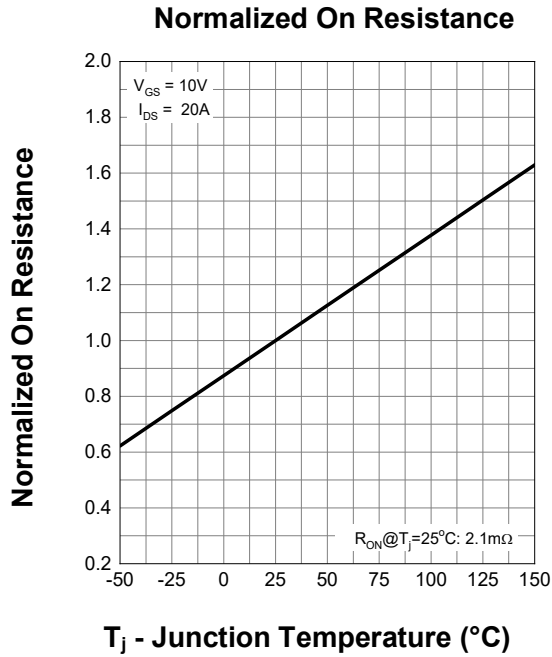


#### Normalized Threshold Voltage





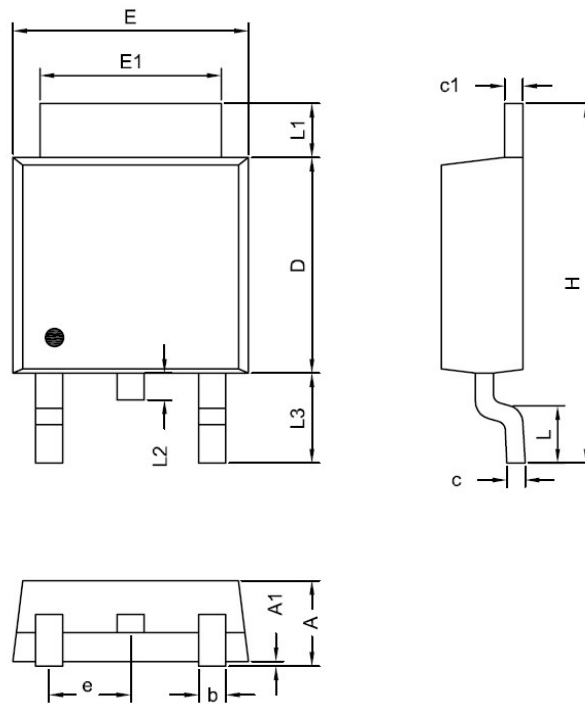
### Typical Characteristics (cont.)





## Package Dimensions

TO252-3L



Symbol	Dimensions In Millimeters	
	MIN.	MAX.
A	2.19	2.38
A1	0.02	0.13
D	5.30	6.40
E	6.35	6.80
E1	5.20	5.50
c	0.40	0.60
c1	0.40	0.60
b	0.55	0.85
e	2.30 BCS	
L	1.00	1.80
L1	0.70	1.80
L2	0.70 BCS	
L3	2.40	2.80
H	9.20	10.40