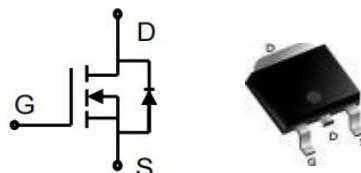


**N-Channel Trench Power MOSFET 100V/40A**

Parameter	Value	Unit
V <sub>DS</sub>	100	V
R <sub>DS(on)</sub>	23	mΩ
I <sub>D</sub>	40	A



TO-252

**FEATURES**

- Advanced Trench Technology
- Provide Excellent RDS(ON) and Low Gate
- Lead free product is acquired

**APPLICATIONS**

- Load Switch
- PWM Application
- Power management

**MAXIMUM RATED VALUES**(at  $T_C=25^\circ\text{C}$  unless otherwise specified)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V <sub>DS</sub>	100	V
Gate-Source Voltage	V <sub>GS</sub>	±20	V
Continue Drain Current	I <sub>D</sub>	40	A
Pulsed Drain Current (Note1)	I <sub>DM</sub>	160	A
Power Dissipation	P <sub>D</sub>	88	W
Single Pulse Avalanche Energy (Note5)	E <sub>AS</sub>	56	mJ
Operating Temperature Range	T <sub>J</sub>	150	°C
Storage Temperature Range	T <sub>TSG</sub>	-55 to +150	°C
Thermal Resistance, Junction to Case(Note 2)	R <sub>θJC</sub>	1.7	°C/W
Thermal Resistance, Junction to Ambient	R <sub>θJA</sub>	62	°C/W

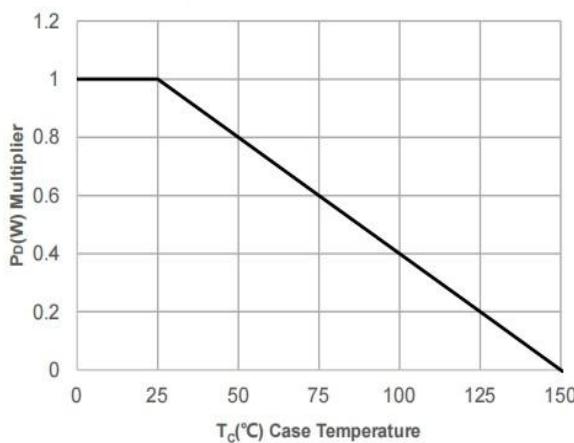
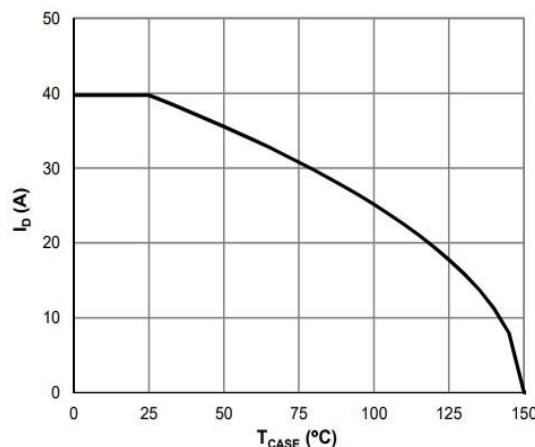
**ELECTRICAL CHARACTERISTICS** (at  $T_J = 25^\circ\text{C}$  unless otherwise specified)

Parameter	Test Condition	Symbol	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	V <sub>GS</sub> = 0V, I <sub>D</sub> = 250μA	BV <sub>DSS</sub>	100	-	-	V
Drain-Source Leakage Current	V <sub>DS</sub> = 100V, V <sub>GS</sub> = 0V	I <sub>DSS</sub>	-	-	1	μA
	V <sub>DS</sub> =100V, T <sub>c</sub> =125°C		-	-	100	μA
Gate Leakage Current	V <sub>GS</sub> = ± 20V, V <sub>DS</sub> = 0V	I <sub>GSS</sub>	-	-	±100	nA
Gate-Source Threshold Voltage	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250 μA	V <sub>GS(th)</sub>	1	-	2	V

Drain-Source On-State Resistance (Not Saturated)	$V_{GS} = 10V, I_D = 20A$	$R_{DS(on)}$	-	23	29	$m\Omega$
	$V_{GS} = 4.5V, I_D = 10A$	$R_{DS(on)}$		24.2	30	$m\Omega$
Input Capacitance	$V_{GS} = 0V, V_{DS} = 25V, f = 1MHz$	$C_{iss}$	-	2858	-	$pF$
Output Capacitance		$C_{oss}$	-	127	-	$pF$
Reverse Transfer Capacitance		$C_{rss}$	-	100	-	$pF$
Turn-on Delay Time	$V_{DS}=30V, ID=15A$ $V_{GS}=10V, RG=1.8\Omega$	$t_{d(ON)}$	-	11	-	ns
Rise Time		$t_r$	-	45	-	ns
Turn-Off Delay Time		$t_{d(OFF)}$	-	67	-	ns
Fall Time		$t_f$	-	48	-	ns
Total Gate Charge	$V_{DS}=30V, ID=15A, V_{GS}=10V$	$Q_G$	-	66	-	$nC$
Gate to Source Charge		$Q_{GS}$	-	10	-	$nC$
Gate to Drain Charge		$Q_{GD}$	-	14	-	$nC$

**SOURCE-DRAIN DIODE CHARACTERISTICS** (at  $T_J = 25^\circ C$  unless otherwise specified)

Parameter	Test Condition	Symbol	Min.	Typ.	Max.	Unit
Maximum Body-Diode Continuous Current (Note 2)		$I_S$	-	-	40	A
Maximum Body-Diode Pulsed Current		$ISM$	-	-	160	A
Drain-Source Diode Forward Voltage (Note 3)	$I_{SD} = 20A$	$V_{SD}$	-	-	1.2	V
Reverse Recovery Time	$I_S = I_F, ISD=30A, V_{GS} = 0 V,$	$trr$	-	28	-	ns
Reverse Recovery Charge	$dI / dt = 100 A/\mu s$ (Note 3)	$Q_{rr}$	-	40	-	$\mu C$

**CHARACTERISTICS DIAGRAMS**
**Figure 1: Power De-rating**

**Figure 2: Current De-rating**


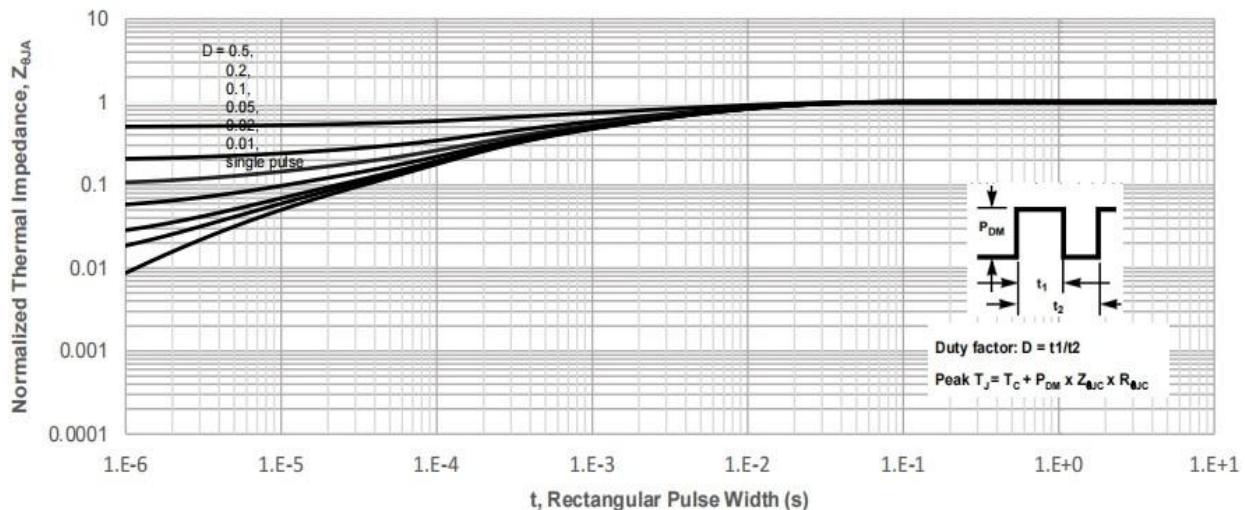
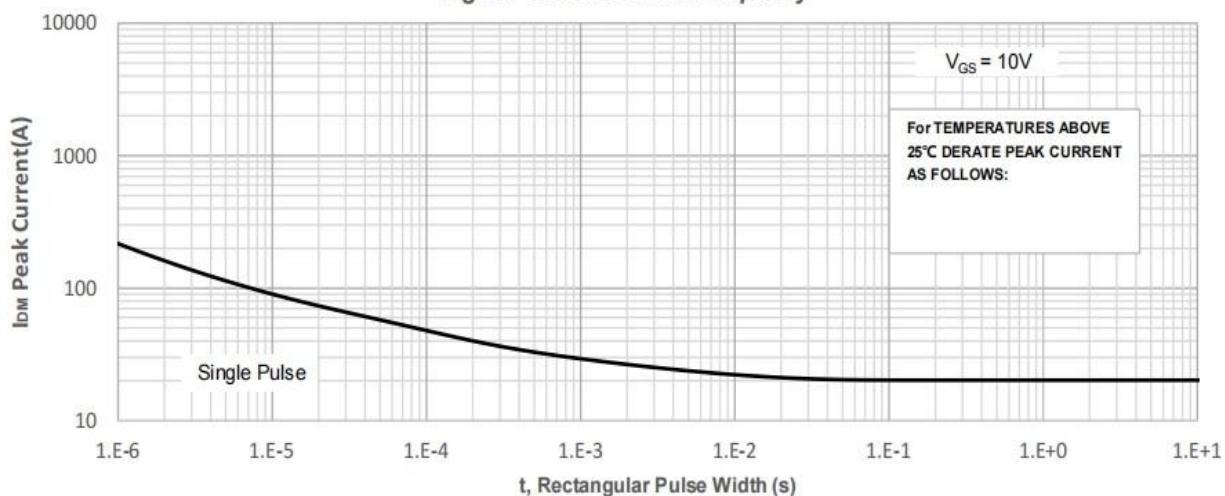
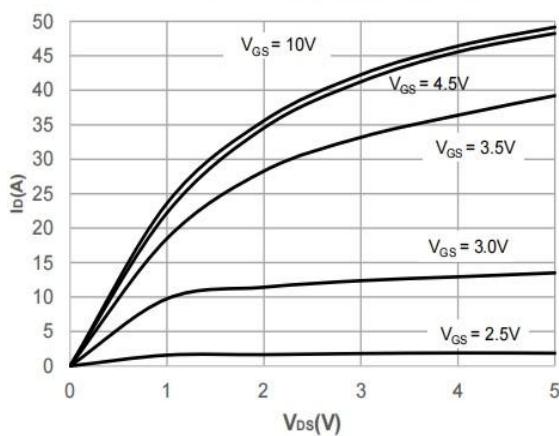
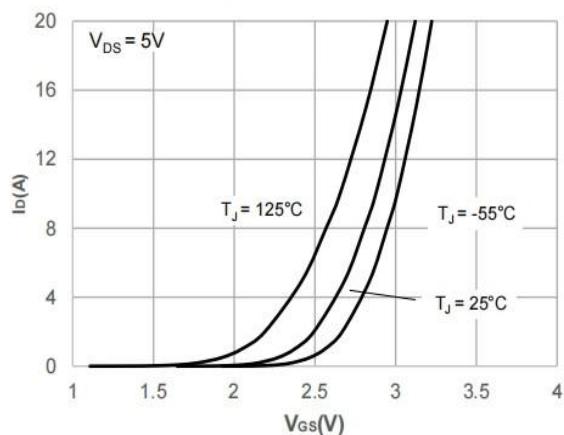
**Figure 3: Normalized Maximum Transient Thermal Impedance**

**Figure 4: Peak Current Capacity**

**Figure 5: Output Characteristics**

**Figure 6: Typical Transfer Characteristics**


Figure 7: On-resistance vs. Drain Current

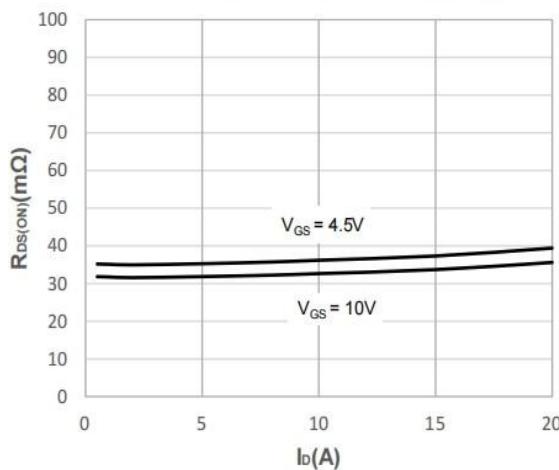


Figure 8: Body Diode Characteristics

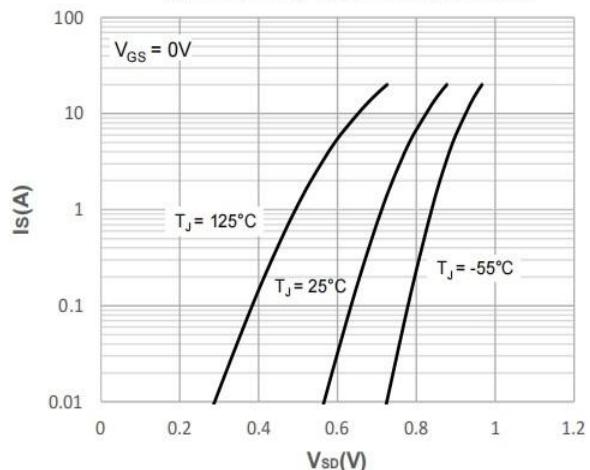


Figure 9: Gate Charge Characteristics

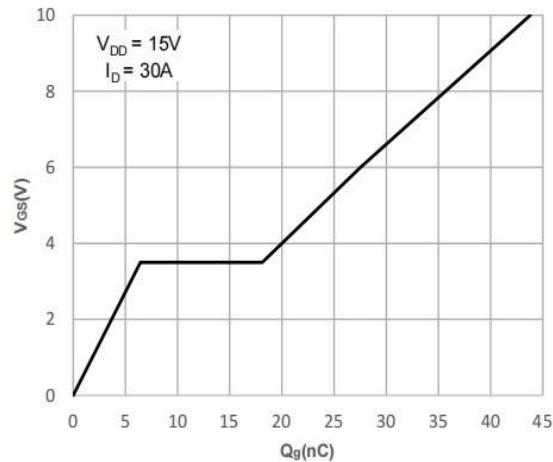


Figure 10: Capacitance Characteristics

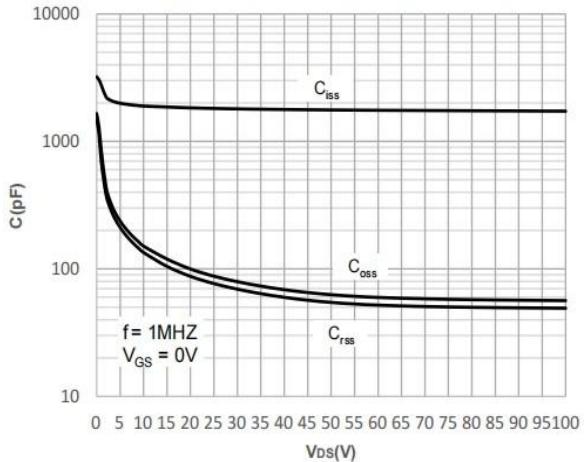


Figure 11: Normalized Breakdown voltage vs. Junction Temperature

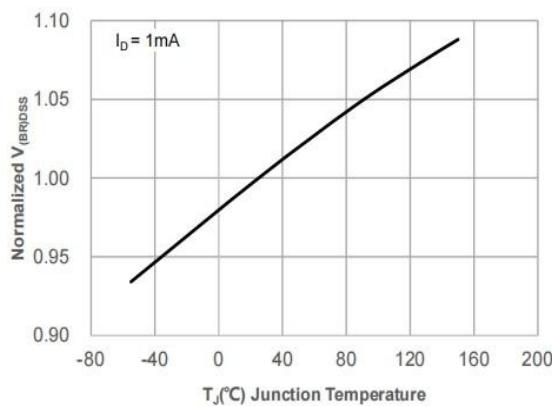
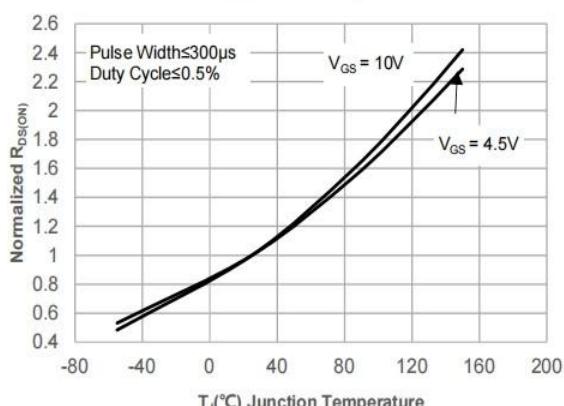
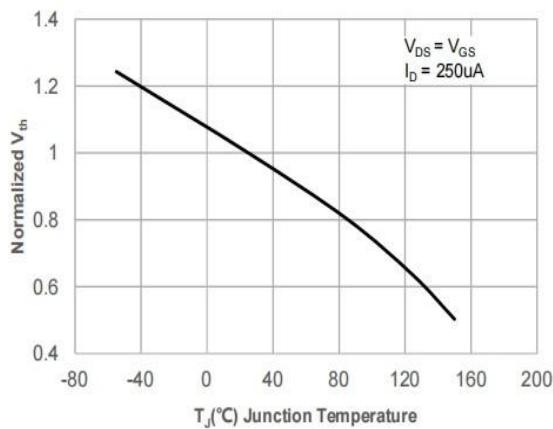
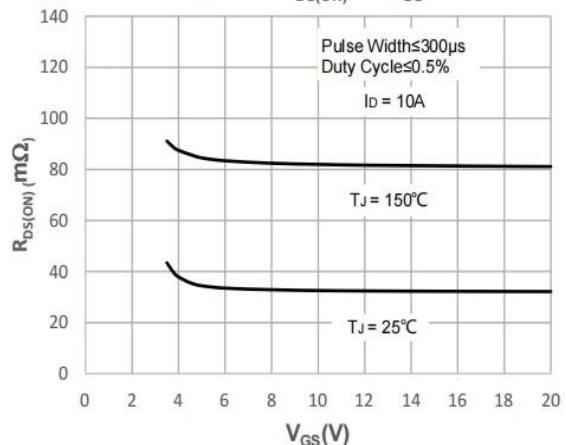
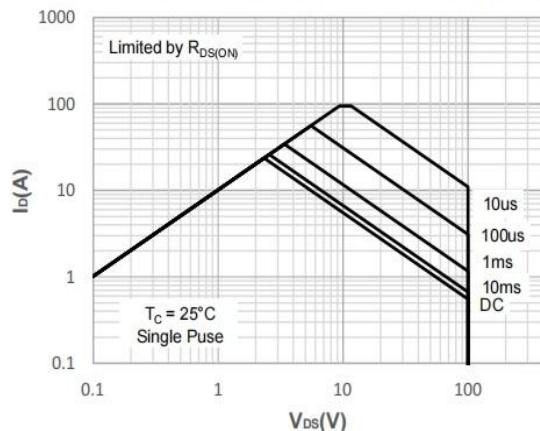
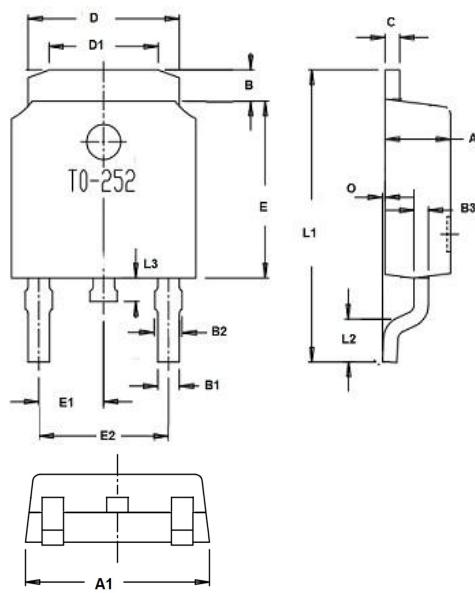


Figure 12: Normalized on Resistance vs. Junction Temperature



**Figure 13: Normalized Threshold Voltage vs. Junction Temperature**

**Figure 14:  $R_{DS(ON)}$  vs.  $V_{GS}$** 

**Figure 15: Maximum Safe Operating Area**


## PACKAGE OUTLINE



Dim.	Min.	Max.
A	2.1	2.5
A1	6.3	6.9
B	0.95	1.55
B1	0.6	0.8
B2	0.75	0.95
C	Typ0.5	
D	5.3	5.5
D1	3.65	4.05
E	5.8	6.4
E1	Typ2.3	
E2	Typ4.6	
O	0	0.15
L1	9	11
L2	Typ1.5	
L3	0.7	1
All Dimensions in millimeter		

**\*Important Usage Information and Disclaimer**

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