

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
30V	4.4mΩ@10V	95A
	7.5mΩ@4.5V	

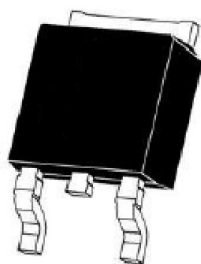
Feature

- High density cell design for ultra low R_{dson}
- Fully characterized avalanche voltage and current
- Good stability and uniformity with high E_{AS}
- Excellent package for good heat dissipation

Application

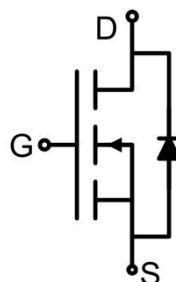
- DC/DC converters
- Synchronous Rectifier

Package

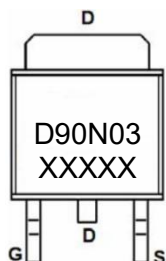


TO-252AB

Circuit diagram



Marking



Absolute maximum ratings ($T_c=25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current	I_D	95	A
Pulsed Drain Current ¹⁾	I_{DM}	380	A
Power Dissipation	P_D	100	W
Thermal Resistance, Junction-to-Case ²⁾	$R_{\theta JC}$	1.5	$^\circ\text{C}/\text{W}$
Single pulse avalanche energy ⁵⁾	E_{AS}	150	mJ
Junction Temperature	T_J	175	$^\circ\text{C}$
Storage Temperature	T_{STG}	-55 ~ +175	$^\circ\text{C}$

Electrical characteristics ($T_c=25^\circ\text{C}$, unless otherwise noted)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-source breakdown voltage	V _{(BR)DSS}	V _{GS} = 0V, I _D =250μA	30			V
Zero gate voltage drain current	I _{DSS}	V _{DS} =30V,V _{GS} = 0V			1	μA
Gate-body leakage current	I _{GSS}	V _{GS} =±20V, V _{DS} = 0V			±100	nA
Gate threshold voltage ³⁾	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	1.0	1.5	2.2	V
Drain-source on-resistance ³⁾	R _{DS(on)}	V _{GS} =10V, I _D =20A		3.7	4.4	mΩ
		V _{GS} =4.5V, I _D =15A		5.5	7.5	
Forward transconductance ³⁾	g _{FS}	V _{DS} =5V, I _D =20A	30			S
Dynamic characteristics ⁴⁾						
Input Capacitance	C _{iss}	V _{DS} =15V,V _{GS} =0V,f =1MHz		1784		pF
Output Capacitance	C _{oss}			266		
Reverse Transfer Capacitance	C _{rss}			212		
Total Gate Charge	Q _g	V _{DS} =15V,V _{GS} =10V,I _D =20A		38.4		nC
Gate-Source Charge	Q _{gs}			5.8		
Gate-Drain Charge	Q _{gd}			7.9		
Turn-on delay time	t _{d(on)}	V _{DD} =15V,V _{GS} =10V, I _D =20A,R _{GEN} =6Ω		7		nS
Turn-on rise time	t _r			6		
Turn-off delay time	t _{d(off)}			30		
Turn-off fall time	t _f			8		
Source-Drain Diode characteristics						
Diode Forward Current ²⁾	I _S				95	A
Diode Forward voltage ³⁾	V _{SD}	V _{GS} =0V, I _S =20A			1.2	V
Reverse Recovery Time	t _{rr}	T _J = 25°C, I _F =20A			47	nS
Reverse Recovery Charge	Q _{rr}	di/dt = 100A/μs ³⁾			25	nC

Notes:

- 1) Repetitive Rating: Pulse width limited by maximum junction temperature.
- 2) Surface Mounted on FR4 Board, $t \leq 10$ sec.
- 3) Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.
- 4) Guaranteed by design, not subject to production
- 5) EAS condition: $T_J = 25^\circ\text{C}, V_{DD} = 15V, V_G = 10V, L = 0.5mH, R_g = 25\Omega$

Typical Characteristics

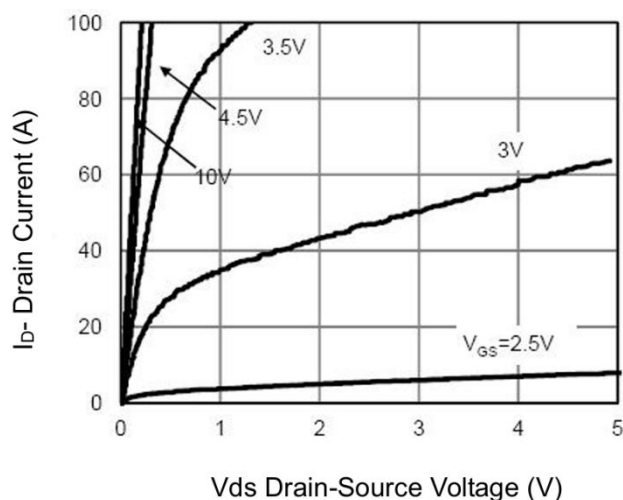


Figure 1 Output Characteristics

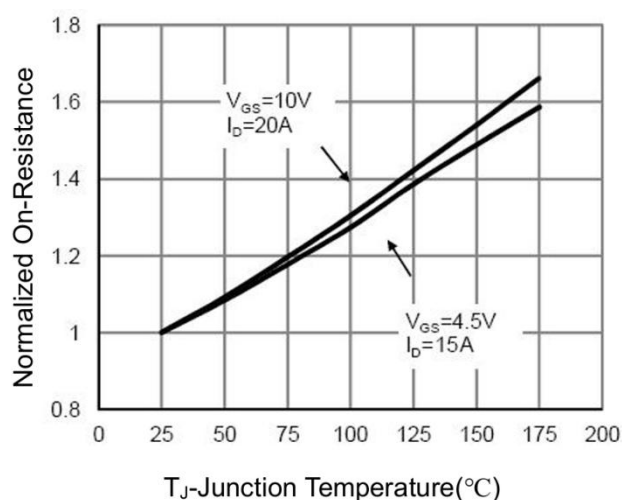


Figure 2 Rdson-Junction Temperature

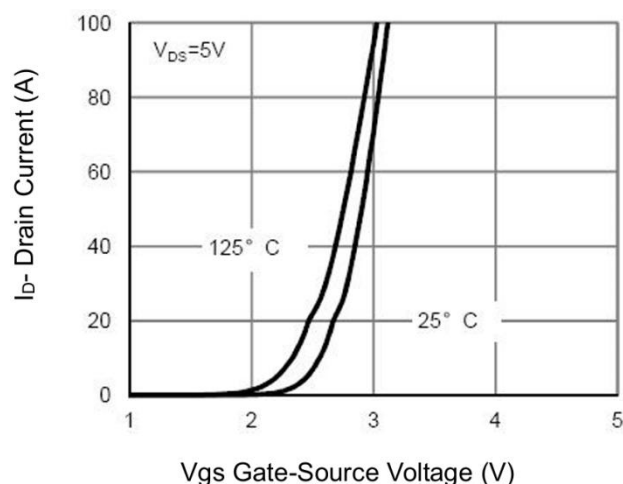


Figure 3 Transfer Characteristics

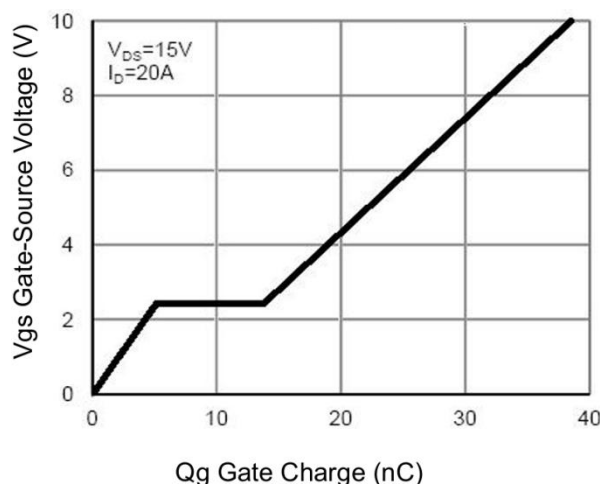


Figure 4 Gate Charge

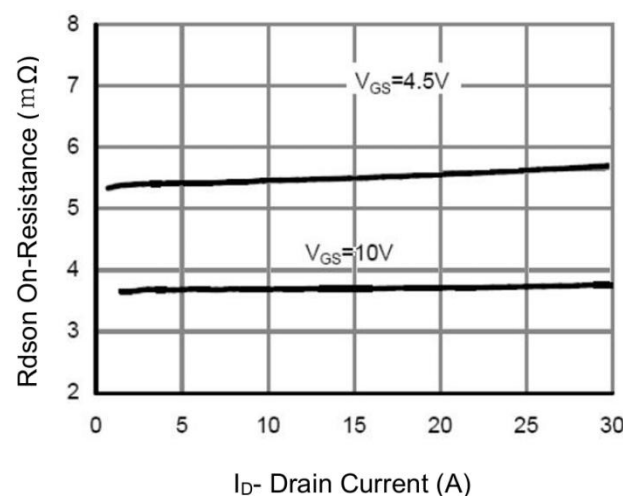


Figure 5 Rdson- Drain Current

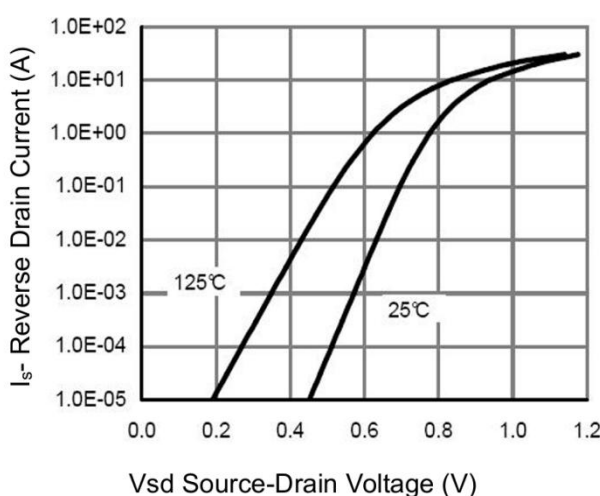
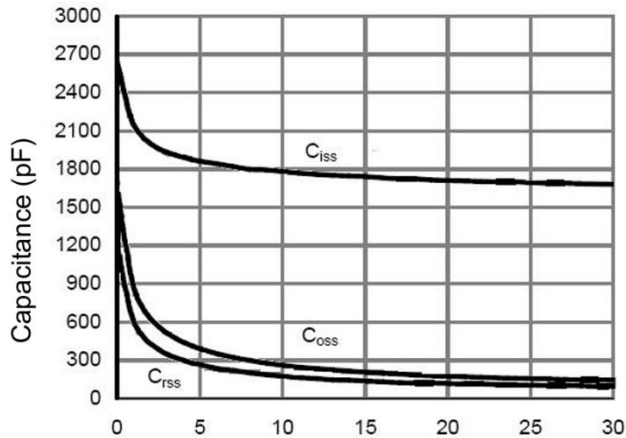
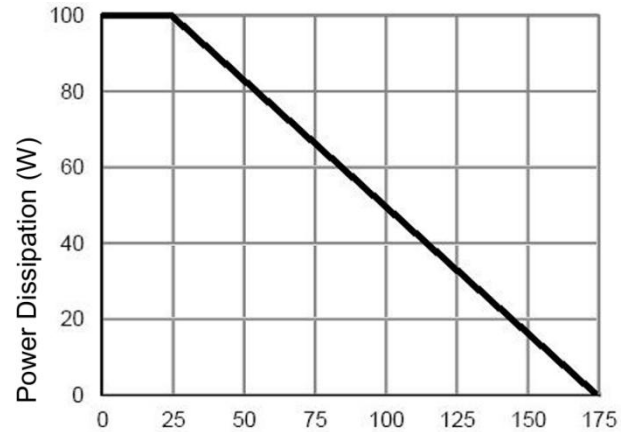


Figure 6 Source- Drain Diode Forward

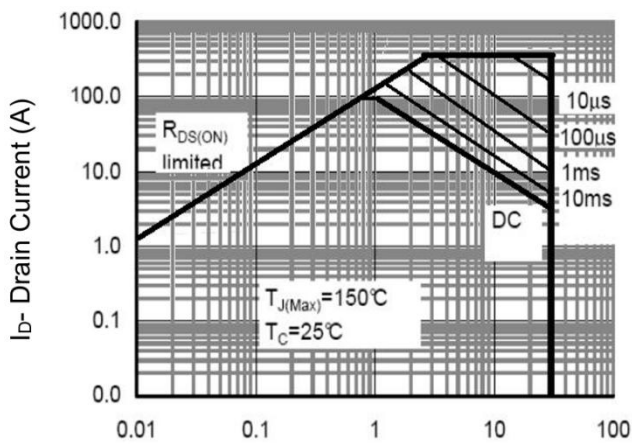
Typical Characteristics



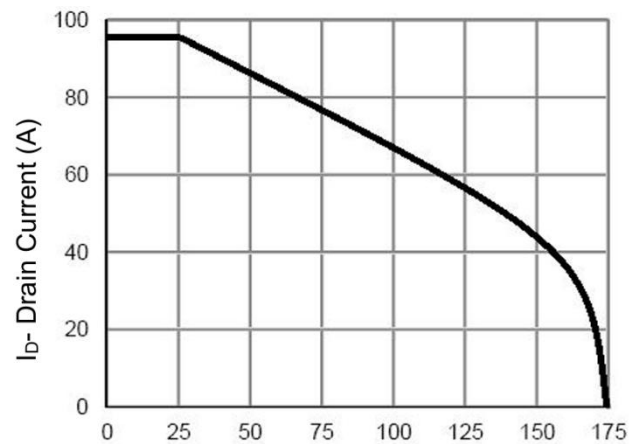
Vds Drain-Source Voltage (V)
Figure 7 Capacitance vs Vds



Tc-Case Temperature(°C)
Figure 8 Power De-rating



Vds Drain-Source Voltage (V)
Figure 9 Safe Operation Area



Tc-Case Temperature(°C)
Figure 10 Current De-rating

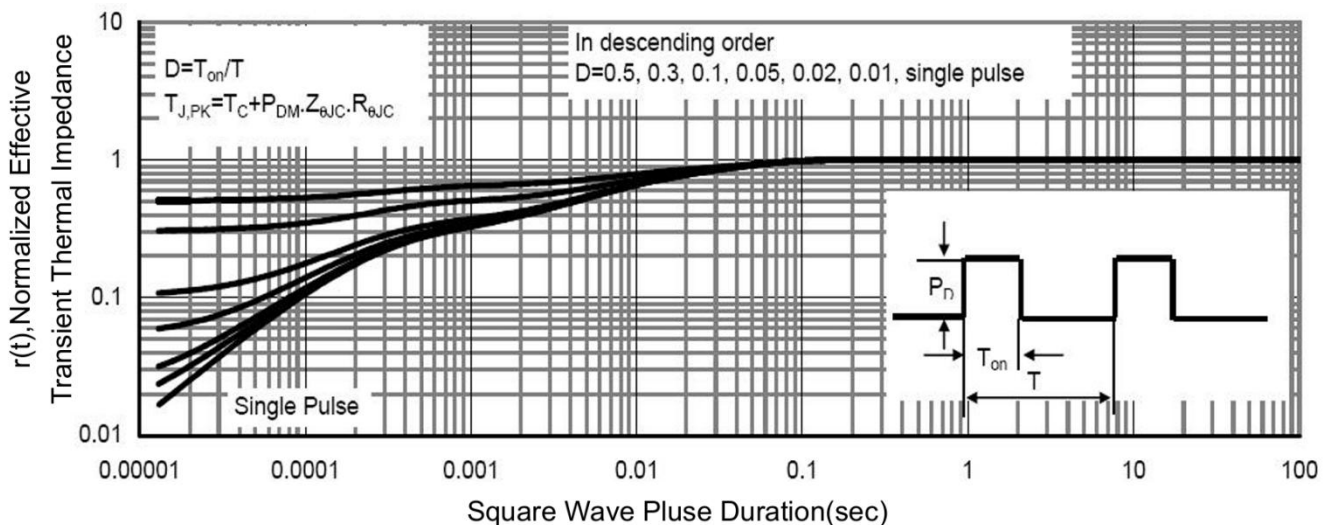
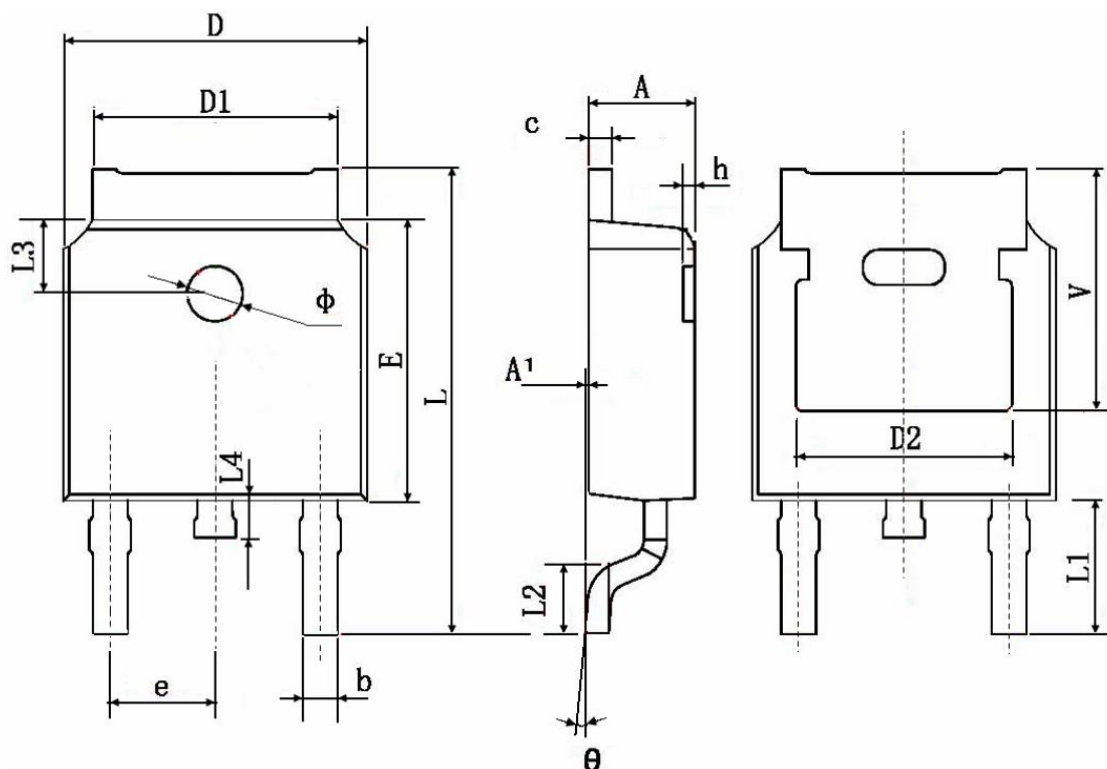


Figure 11 Normalized Maximum Transient Thermal Impedance

TO-252AB Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.200	2.400	0.087	0.094
A1	0.000	0.130	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	5.500	0.201	0.217
D2	4.830 REF.		0.190 REF.	
E	6.000	6.200	0.236	0.244
e	2.186	2.390	0.086	0.094
L	9.800	10.500	0.386	0.413
L1	2.900 REF.		0.114 REF.	
L2	1.400	1.800	0.055	0.070
L3	1.600 REF.		0.063 REF.	
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.	