

Features

- 30V, 90A
 $R_{DS(ON)} 3.88m\Omega @ V_{GS} = 10V$ (Typ)
- Advanced Trench Technology
- Provide Excellent $R_{DS(ON)}$ and Low Gate Charge
- Lead free product is acquired

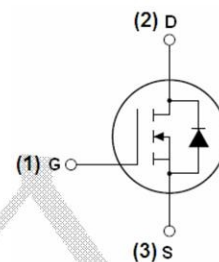
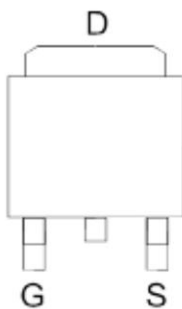
Application

- Load Switch
- PWM Application
- Power management

Package and Pin Configuration

(TO-252-3L)

Top View



Marking:



Absolute Maximum Ratings ($T_C=25^\circ\text{C}$ unless otherwise specified)

Symbol	Parameter	Max.	Units	
V_{DSS}	Drain-Source Voltage	30	V	
V_{GSS}	Gate-Source Voltage	± 20	V	
I_D	Continuous Drain Current	$T_C = 25^\circ\text{C}$	90	A
		$T_C = 100^\circ\text{C}$	60	A
I_{DM}	Pulsed Drain Current ^{note1}	180	A	
EAS	Single Pulsed Avalanche Energy ^{note2}	225	mJ	
P_D	Power Dissipation	$T_C = 25^\circ\text{C}$	181	W
$R_{\theta JC}$	Thermal Resistance, Junction to Case	0.83	$^\circ\text{C}/\text{W}$	
T_J, T_{STG}	Operating and Storage Temperature Range	-55 to +175	$^\circ\text{C}$	

Electrical Characteristics (T_J=25°C unless otherwise specified)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
Off Characteristic						
V _{(BR)DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250μA	30	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =30V, V _{GS} = 0V,	-	-	1.0	μA
I _{GSS}	Gate to Body Leakage Current	V _{DS} =0V, V _{GS} = ±20V	-	-	±100	nA
On Characteristics						
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250μA	0.8	1.4	2.0	V
R _{DS(on)}	Static Drain-Source on-Resistance	V _{GS} =10V, I _D =10A	-	3.88	5.0	mΩ
R _{DS(on)}	Static Drain-Source on-Resistance	V _{GS} =4.5V, I _D =8A	-	6.3	7.5	mΩ
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} =20V, V _{GS} =0V, f=1.0MHz	-	5672	-	pF
C _{oss}	Output Capacitance		-	392	-	pF
C _{rss}	Reverse Transfer Capacitance		-	352	-	pF
Q _g	Total Gate Charge	V _{DS} =30V, I _D =30A, V _{GS} =10V	-	103	-	nC
Q _{gs}	Gate-Source Charge		-	15	-	nC
Q _{gd}	Gate-Drain("Miller") Charge		-	32	-	nC
Switching Characteristics						
t _{d(on)}	Turn-on Delay Time	V _{DS} =30V, I _D =30A, R _G =1.8Ω, V _{GS} =10V	-	12	-	ns
t _r	Turn-on Rise Time		-	8	-	ns
t _{d(off)}	Turn-off Delay Time		-	49	-	ns
t _f	Turn-off Fall Time		-	15	-	ns
Drain-Source Diode Characteristics and Maximum Ratings						
I _S	Maximum Continuous Drain to Source Diode Forward Current		-	-	90	A
I _{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	180	A
V _{SD}	Drain to Source Diode Forward Voltage	V _{GS} =0V, I _S =5A	-	0.78	1.0	V
t _{rr}	Body Diode Reverse Recovery Time	I _F =30A, dI/dt=100A/μs	-	27	-	ns
Q _{rr}	Body Diode Reverse Recovery Charge		-	48	-	nC

- Notes: 1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature
 2. EAS condition : T_J=25°C, V_{DD}=30V, V_G=10V, L=0.5mH, R_G=25Ω, I_{AS}=30A
 3. Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%

Typical Electrical and Thermal Characteristic Curves

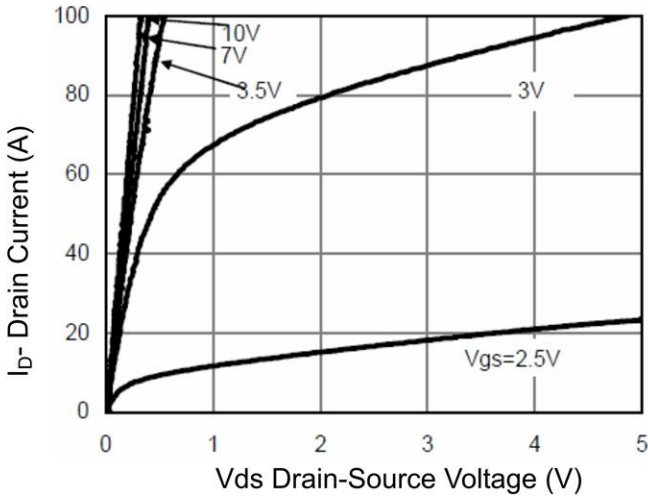


Figure 1 Output Characteristics

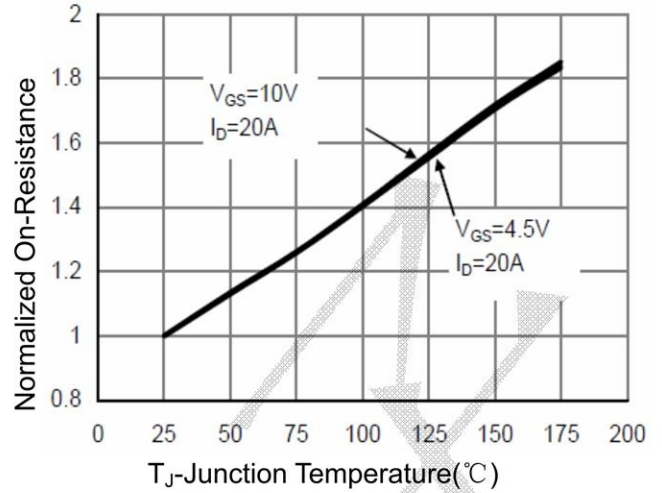


Figure 4 R_{dson} -Junction Temperature

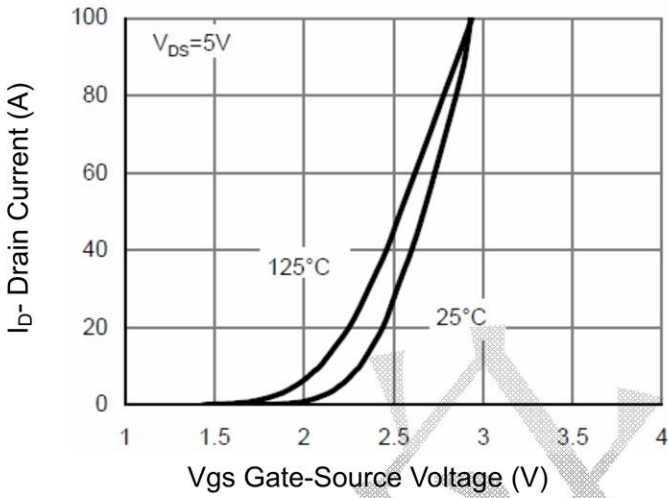


Figure 2 Transfer Characteristics

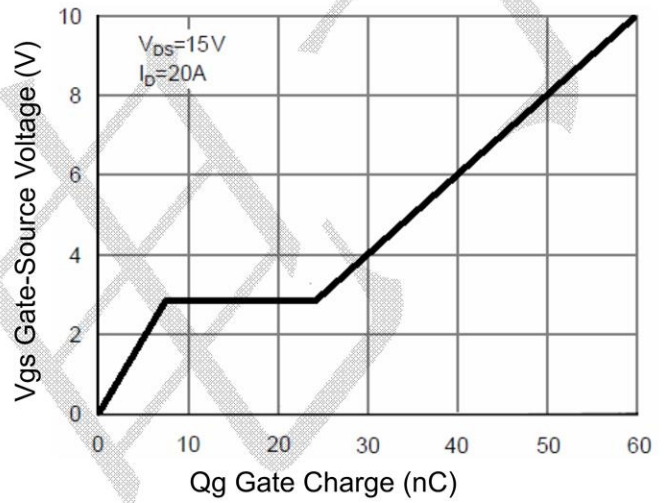


Figure 5 Gate Charge

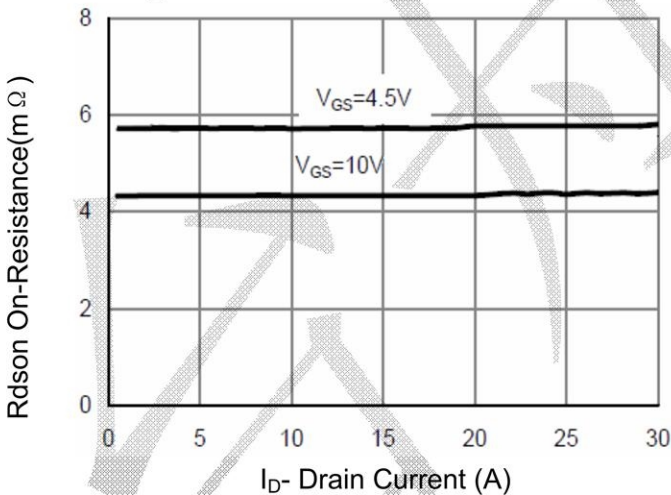


Figure 3 R_{dson} - Drain Current

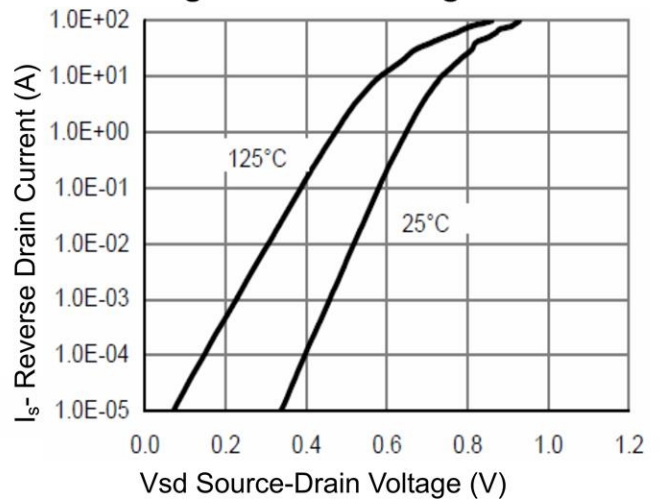


Figure 6 Source- Drain Diode Forward

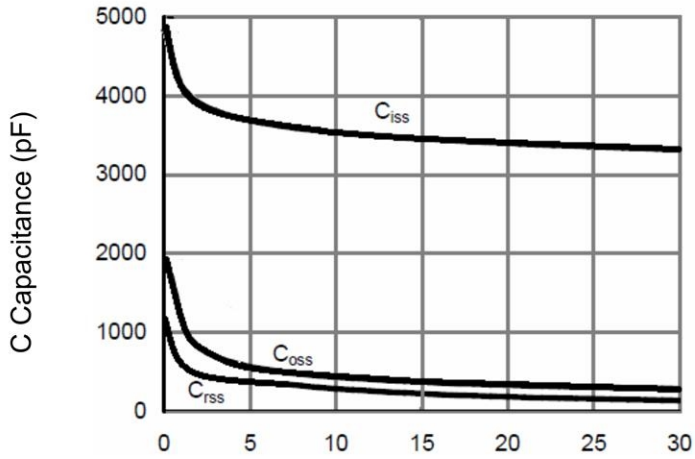


Figure 7 Capacitance vs Vds

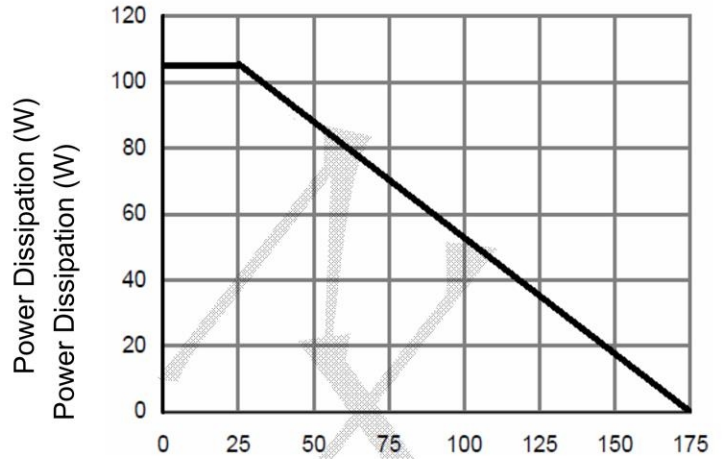


Figure 9 Power De-rating

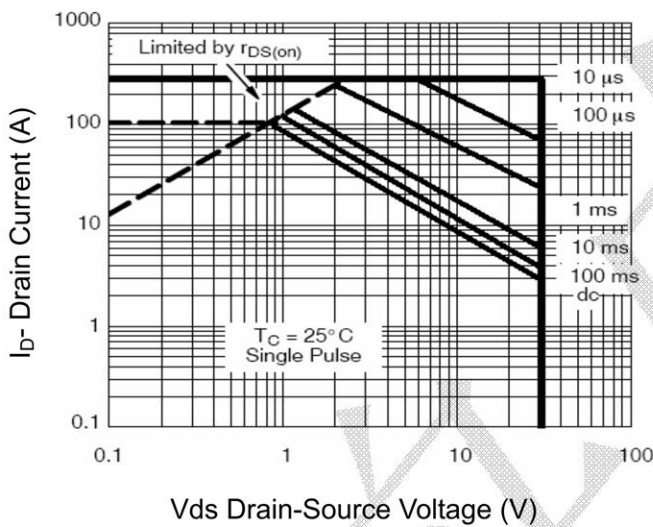


Figure 8 Safe Operation Area

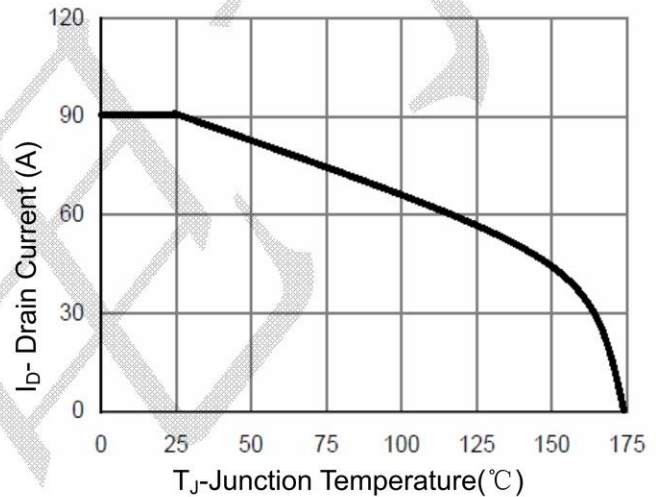


Figure 10 ID Current Derating

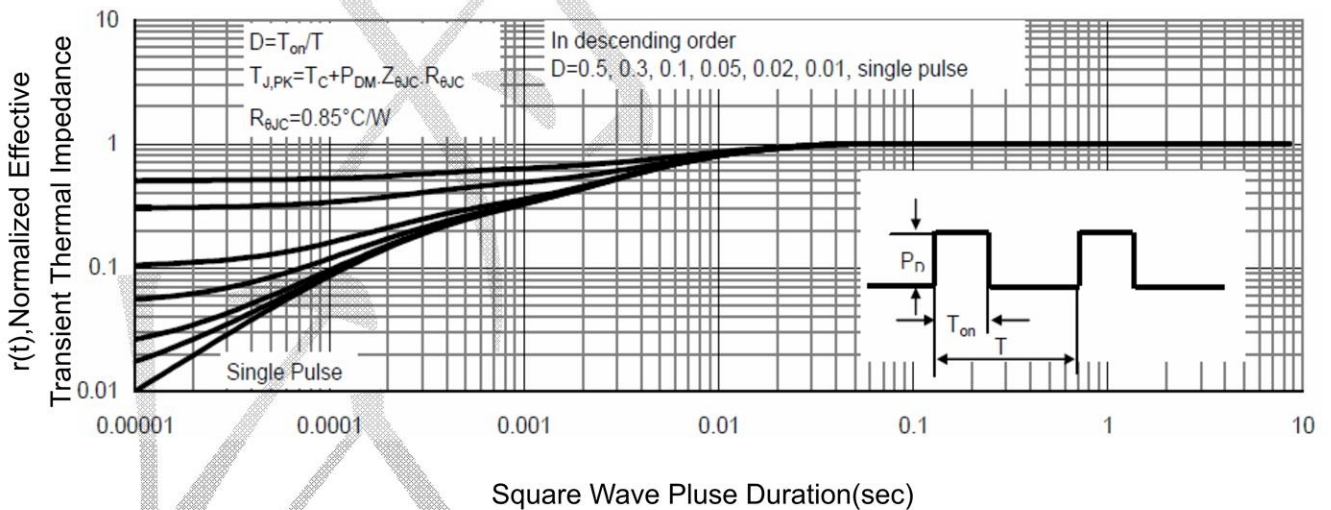
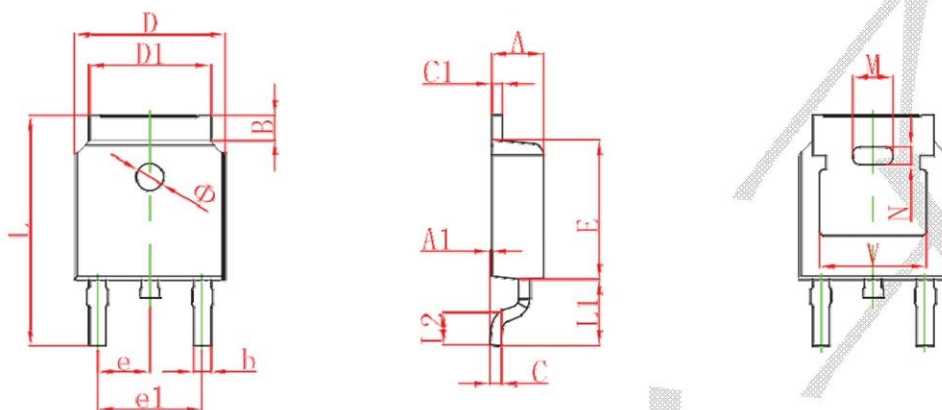


Figure 11 Normalized Maximum Transient Thermal Impedance

TO252 Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.200	2.380	0.087	0.094
A1	0.000	0.100	0.000	0.004
B	0.800	1.400	0.031	0.055
b	0.710	0.810	0.028	0.032
c	0.460	0.560	0.018	0.022
c1	0.460	0.560	0.018	0.022
D	6.500	6.700	0.256	0.264
D1	5.130	5.460	0.202	0.215
E	6.000	6.200	0.236	0.244
e	2.286 TYP.		0.090 TYP.	
e1	4.327	4.727	0.170	0.186
M	1.778 REF.		0.070 REF.	
N	0.762 REF.		0.018 REF.	
L	9.800	10.400	0.386	0.409
L1	2.9 REF.		0.114 REF.	
L2	1.400	1.700	0.055	0.067
V	4.830 REF.		0.190 REF.	
\bar{Y}	1.100	1.300	0.043	0.051