

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
30V	6.5m Ω @10V	40A
	10m Ω @4.5V	

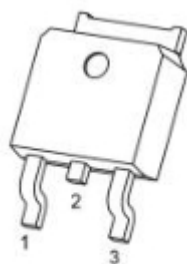
Feature

- Trench Power Technology
- Low $R_{DS(ON)}$
- Low Gate Charge
- Optimized for Fast-switching Applications

Application

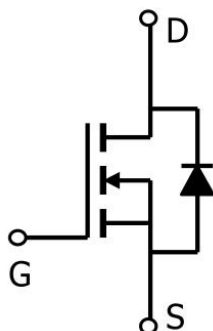
- High Speed Power Switching
- DC/DC Converters

Package



TO-252 (G:1 D:2 S:3)

Circuit diagram



Marking



30N06G : Product code
 ** : Week code.

Absolute maximum ratings

($T_a=25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current ($T_C=25^{\circ}\text{C}$)	I_D	40	A
Pulsed Drain Current	I_{DM}	160	A
Single Pulse Avalanche Energy	E_{AS}	39	mJ
Power Dissipation ($T_C=25^{\circ}\text{C}$)	P_D	34	W
Thermal Resistance,Junction-to-Case	$R_{\theta JC}$	3.67	$^{\circ}\text{C}/\text{W}$
Operating Junction and Storage Temperature Range	T_{STG}, T_J	-55~+150	$^{\circ}\text{C}$

Electrical characteristics

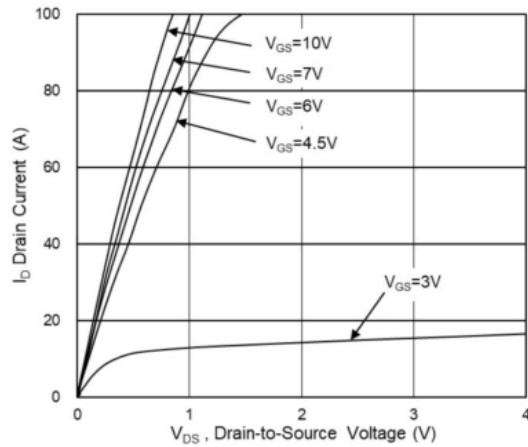
(T_A=25°C, unless otherwise noted)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	BV (BR) _{DSS}	V _{GS} = 0V, I _D =250μA	30			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =24V, V _{GS} = 0V			1	uA
Gate-Source Leakage	I _{GSS}	V _{GS} = ±20V			±100	uA
Gate-Source Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	1	1.7	2.5	V
Drain-Source On-Resistance	R _{DS(on)}	V _{GS} =10V, I _D =20A		6.5	8.2	mΩ
		V _{GS} =4.5V, I _D =20A		10	13.5	
Forward Transconductance	g _{fs}	V _{DS} =5V, I _D =45A		60		S
Dynamic Characteristics						
Input Capacitance	C _{iss}	V _{GS} =0V, V _{DS} =40V, f=1MHz		823		pF
Output Capacitance	C _{Oss}			345		
Reverse Transfer Capacitance	C _{rss}			15		
Total Gate Charge	Q _g	V _{DD} =15V, I _D =20A, V _{GS} =10V		15		pF
Gate-Source Charge	Q _{gs}			2.2		
Gate-Drain Charge	Q _{gd}			3.1		
Turn-on Delay Time	T _{d(on)}	V _{DD} =15V, V _{GS} =10V, I _D =20A, R _G =0.8Ω		6.4		nS
Turn-on Rise Time	T _r			2.6		
Turn-off Delay Time	T _{d(off)}			16.5		
Turn-off Fall Time	T _f			2.7		
Drain-Source Diode Characteristics						
Diode Forward Voltage	V _{SD}	V _{GS} =0V , I _S =45A			1.2	V

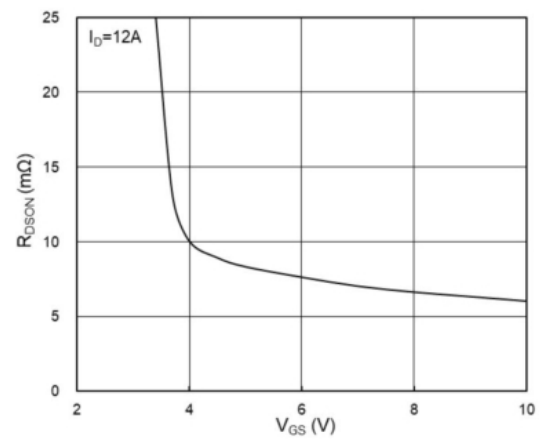
Notes:

1. E_{AS} condition: V_{DD} = 15V, V_G=10V, L=0.1mH, R_G=25Ω, T_J = 25°C..

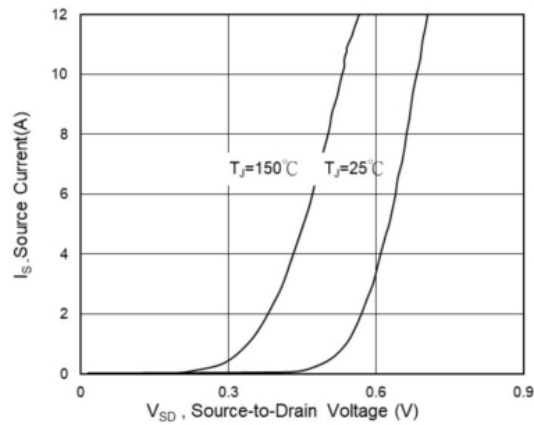
Typical Characteristics



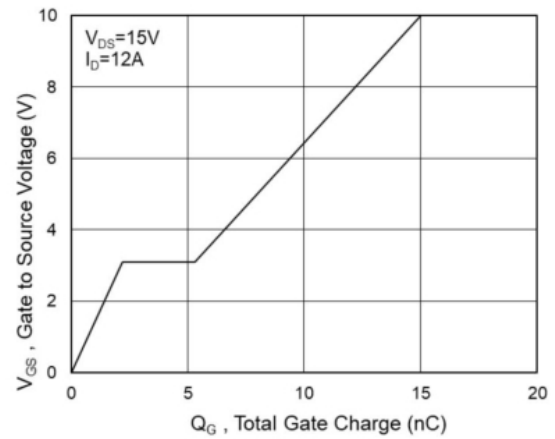
Typical Output Characteristics



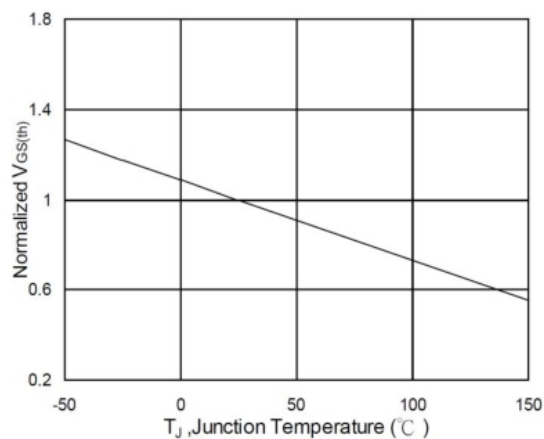
On-Resistance vs G-S Voltage



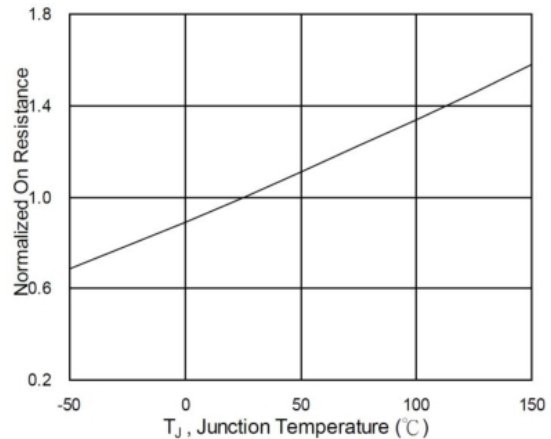
Source Drain Forward Characteristics



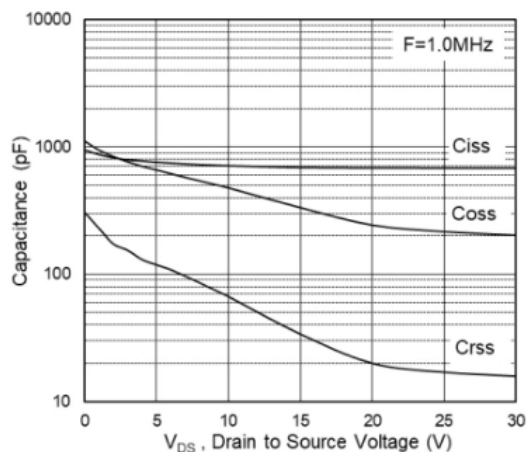
Gate-Charge Characteristics



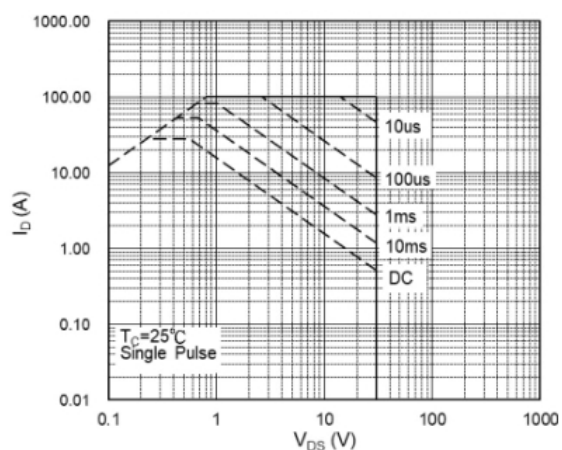
Normalized $V_{GS(th)}$ vs T_J



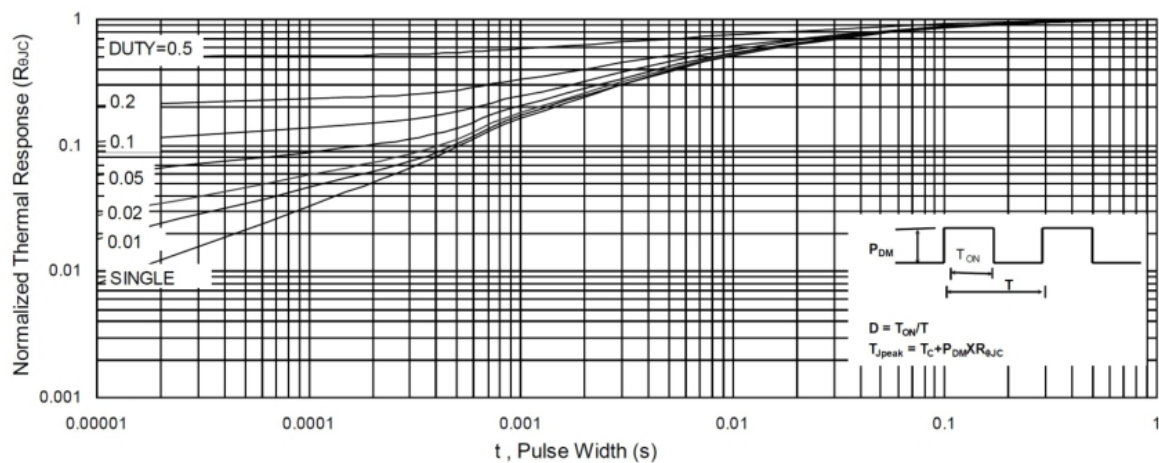
Normalized $R_{DS(on)}$ vs T_J



Capacitance

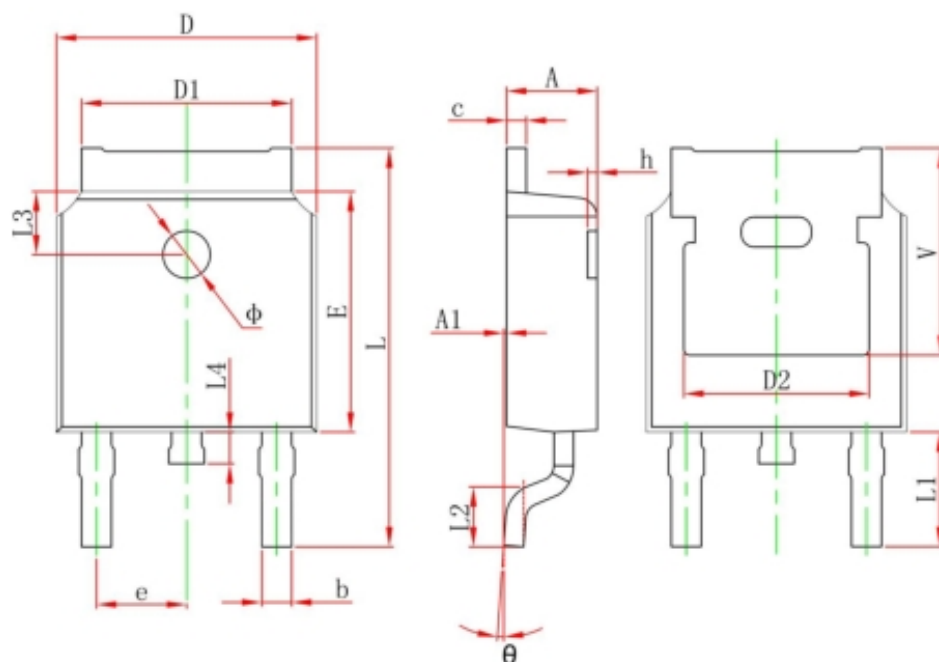


Safe Operating Area



Normalized Maximum Transient Thermal Impedance

TO-252 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	0.127	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 REF.		0.190 REF.	
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 REF.		0.114 REF.	
L2	1.400	1.700	0.055	0.067
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 REF.		0.211 REF.	