

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
-60V	109mΩ@-10V	-12A
	136mΩ@-4.5V	

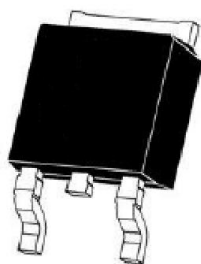
Feature

- Advanced split gate trench technology
- Excellent $R_{DS(on)}$
- Low gate charge

Application

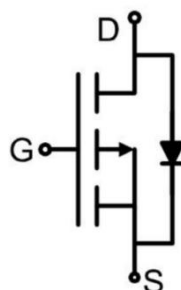
- PWM application
- Load switch
- Power management

Package

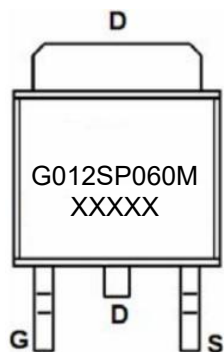


TO-252AB

Circuit diagram



Marking



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

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	-60	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current ($T_C=25^{\circ}\text{C}$)	I_D	-12	A
Continuous Drain Current ($T_C=100^{\circ}\text{C}$)	$I_D(100^{\circ}\text{C})$	-7.2	A
Pulsed Drain Current ¹⁾	I_{DM}	-48	A
Single Pulse Avalanche Energy ²⁾	E_{AS}	14	mJ
Power Dissipation($T_C=25^{\circ}\text{C}$)	P_D	27	W
Thermal Resistance Junction to Case	$R_{\theta JC}$	4.6	$^{\circ}\text{C/W}$
Operating Junction Temperature	T_J	$-55 \sim +150$	$^{\circ}\text{C}$
Storage Temperature	T_{STG}	$-55 \sim +150$	$^{\circ}\text{C}$

Electrical characteristics ($T_J=25^{\circ}\text{C}$, 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	-60			V
Zero gate voltage drain current	I _{DSS}	V _{DS} =-60V, V _{GS} =0V			-1	μA
Gate-body leakage current	I _{GSS}	V _{DS} =0V, V _{GS} =±20V			±100	nA
Gate threshold voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =-250μA	-1.1	-1.6	-2.4	V
Static Drain-source on-resistance ³⁾	R _{DS(on)}	V _{GS} =-10V, I _D =-6A		84	109	mΩ
		V _{GS} =-4.5V, I _D =-4A		105	136	
Dynamic characteristics ⁴⁾						
Input Capacitance	C _{iss}	V _{DS} =-30V, V _{GS} =0V, f =1MHz		324		pF
Output Capacitance	C _{oss}			66		
Reverse Transfer Capacitance	C _{rss}			4		
Total Gate Charge	Q _g	V _{DS} =-30V, V _{GS} =-10V I _D =-2A		5		nC
Gate-Source Charge	Q _{gs}			1		
Gate-Drain Charge	Q _{gd}			0.72		
Turn-on delay time	t _{d(on)}	V _{DS} =-30V, V _{GS} =-10V I _D =-2A, R _G =5Ω		6.8		nS
Turn-on rise time	t _r			8		
Turn-off delay time	t _{d(off)}			16		
Turn-off fall time	t _f			4		
Source-Drain Diode characteristics						
Diode Forward Current	I _S				-12	A
Diode Forward voltage	V _{SD}	V _{GS} =0V, I _S =-6A			-1.2	V

Notes:

1) Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature.

2) EAS condition: Starting $T_J=25^{\circ}\text{C}$, $V_{DD}=-30V$, $V_{GS}=-10V$, $R_G=25\Omega$, $L=0.5mH$, $I_{AS}=-7.5A$.

3) Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 0.5\%$.

4) Guaranteed by design, not subject to production testing.

Typical Characteristics

Figure 1: Output Characteristics

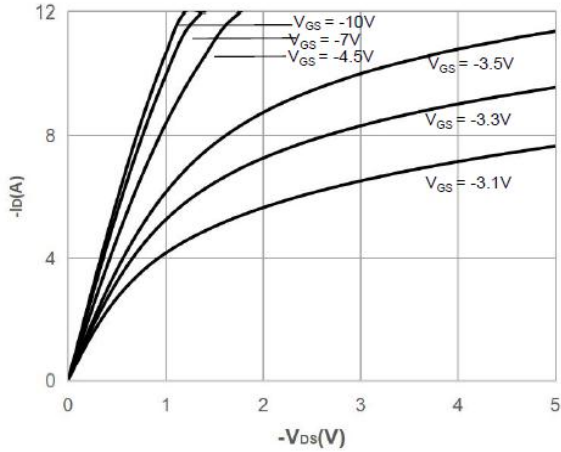


Figure 2: Typical Transfer Characteristics

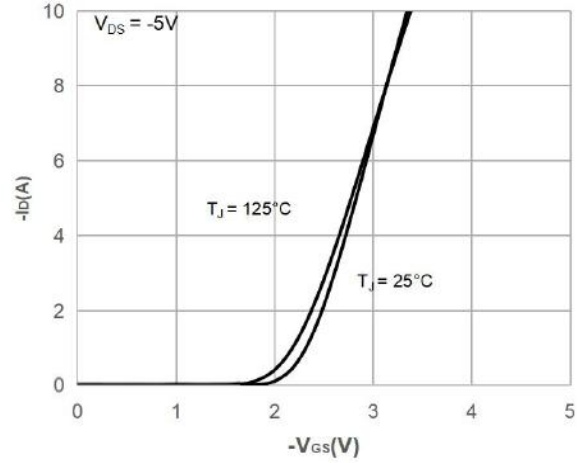


Figure 3: On-resistance vs. Drain Current

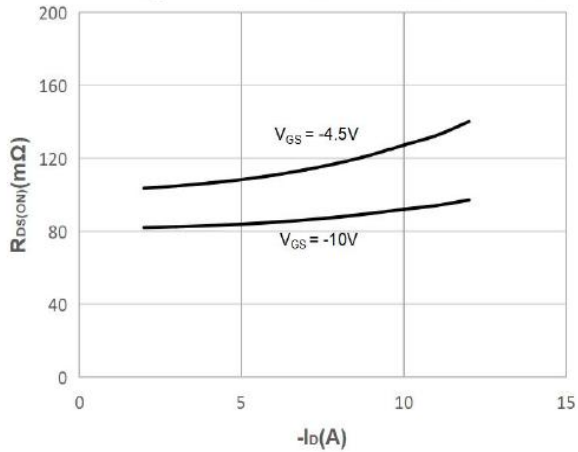


Figure 4: Body Diode Characteristics

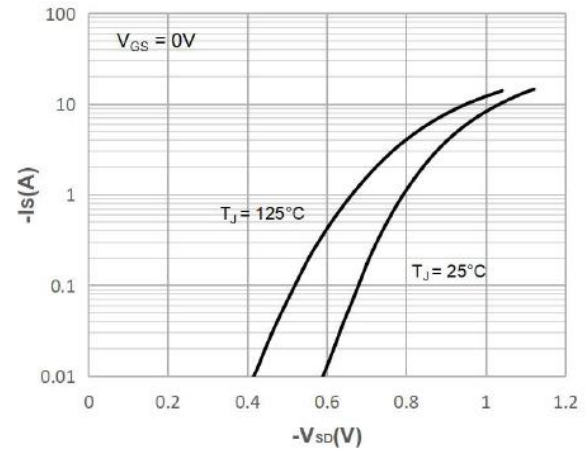


Figure 5: Gate Charge Characteristics

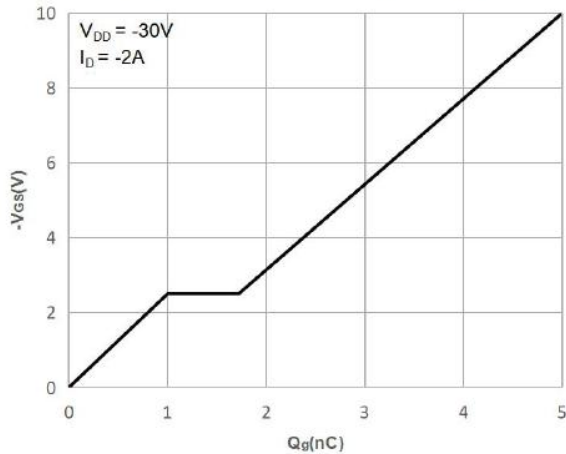
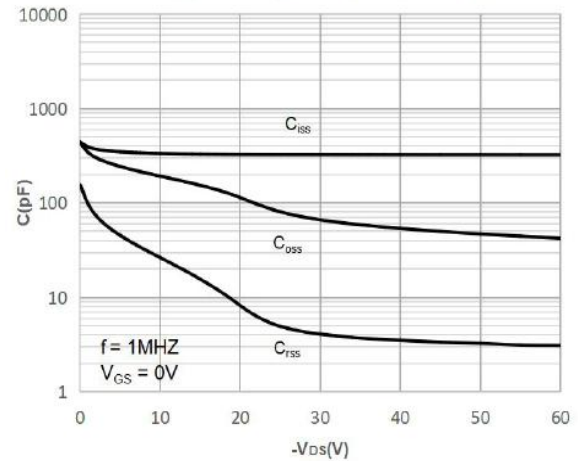


Figure 6: Capacitance Characteristics



Typical Characteristics

Figure 7: Normalized Breakdown voltage vs. Junction Temperature

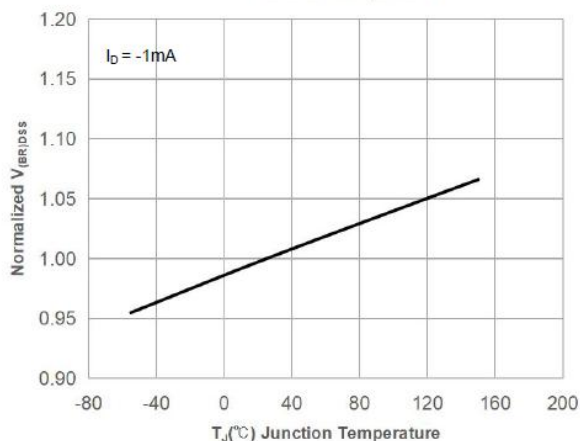


Figure 8: Normalized on Resistance vs. Junction Temperature

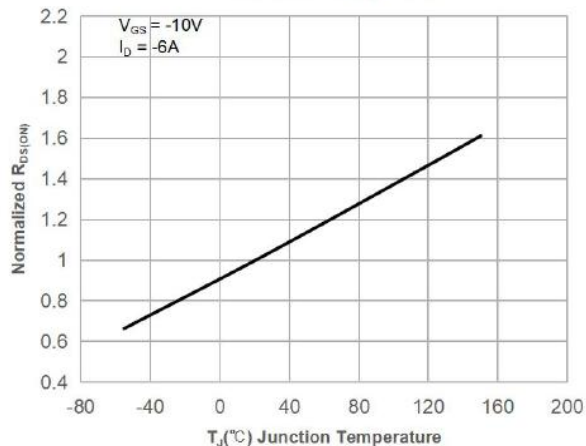


Figure 9: Maximum Safe Operating Area

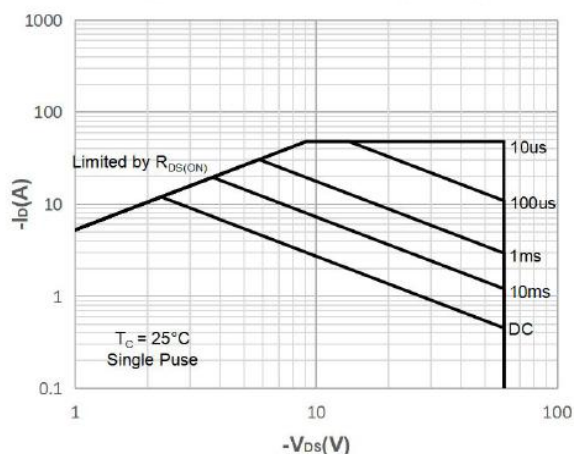


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

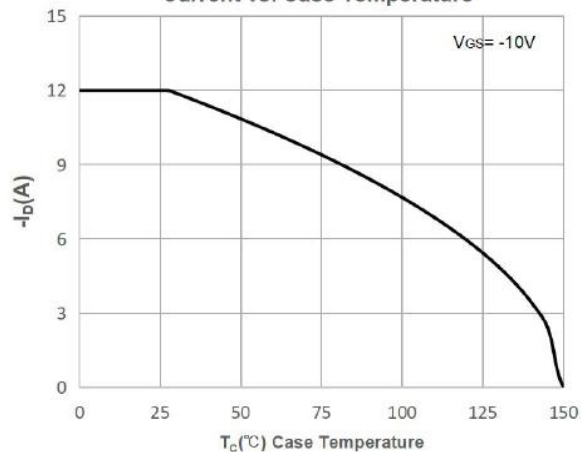


Figure 11: Normalized Maximum Transient Thermal Impedance

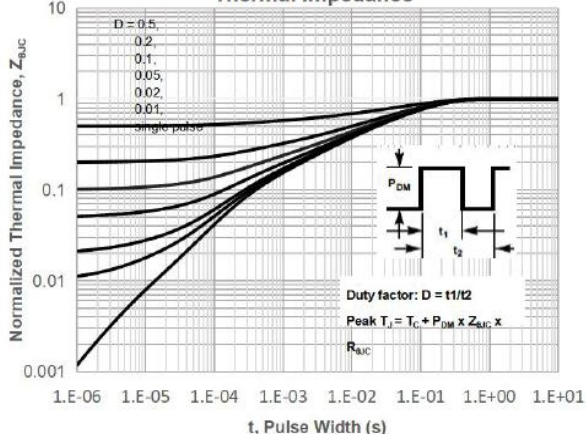
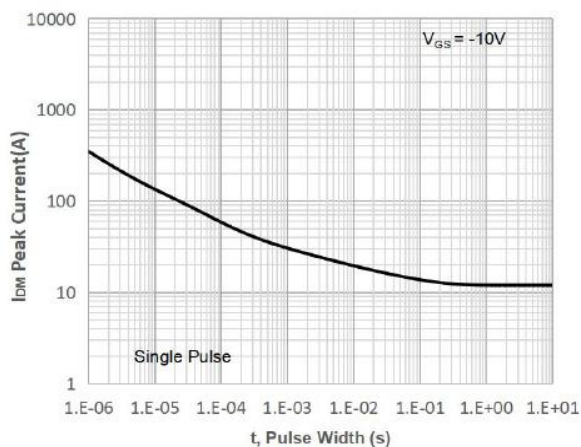
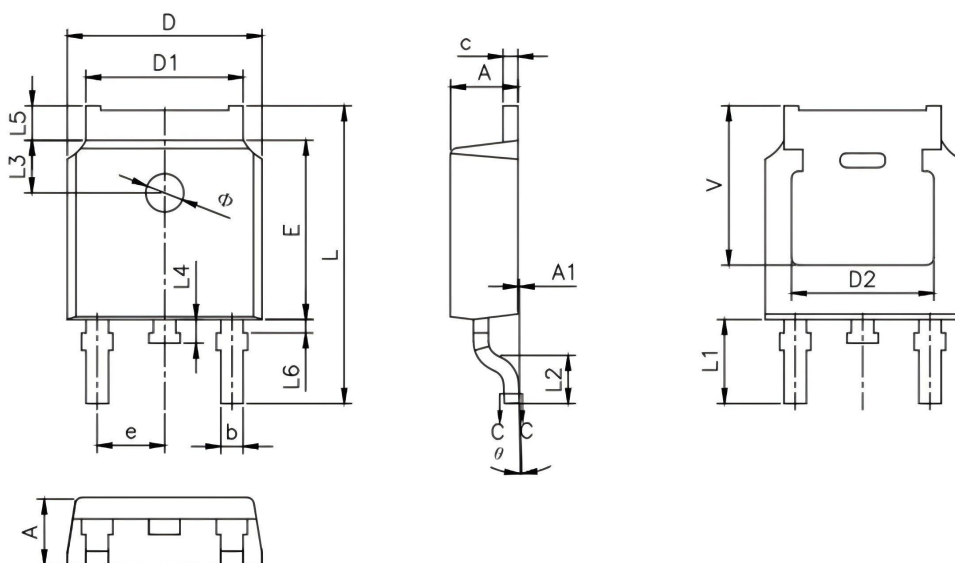


Figure 12: Peak Current Capacity



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	0.127	0.000	0.005
b	0.660	0.860	0.026	0.034
D	6.500	6.700	0.256	0.264
D1	5.100	5.460	0.201	0.215
c	0.470	0.600	0.019	0.024
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	1.600	0.055	0.063
L3	1.800 REF.		0.071 REF.	
L4	0.600	1.000	0.024	0.039
L5	0.900	1.250	0.035	0.049
L6	0.150	0.750	0.006	0.030
ϕ	1.100	1.300	0.043	0.051
θ	0°	8°	0°	8°
V	5.400 REF.		0.213 REF.	