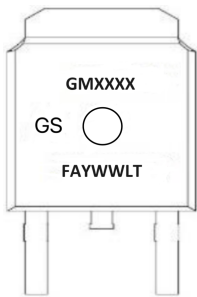
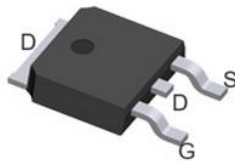


Product Summary

V_{DS} (V)	$R_{DS(on),max}$ (mΩ)	I_D (A)
-40	33@ $V_{GS} = -10V$	-25

View and Internal Schematic Diagram



TO-252

NOTE:
 LOGO - GS
 GMXXXXX- Part number code
 F - Fab location code
 A - Assembly location code
 Y - Year code
 WW - Week code
 L&T - Assembly lot code

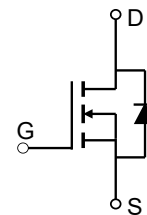
Features

- Low $R_{DS(on)}$ trench technology
- Low thermal impedance
- Fast switching speed
- 100% avalanche tested

Application

- Synchronous rectification
- PWM Application
- Load switching
- Power Management

Equivalent circuit



Absolute Maximum Rating ($T_a=25^\circ\text{C}$)

Parameter		Symbol	Limit	Unit
Drain-source voltage		V_{DS}	-30	V
Gate-source voltage		V_{GS}	± 20	
Continuous drain current ($V_{GS}=-10V$) ⁽¹⁾	$T_C=25^\circ\text{C}$	I_D	-25	A
	$T_C=100^\circ\text{C}$		-18	
Pulsed drain current ⁽²⁾		$I_{D,pulse}$	-74	
Single Pulse Avalanche Energy ⁽³⁾		EAS	42	mJ
Power dissipation	$T_C=25^\circ\text{C}$	P_D	32.8	W
Operating junction and storage temperature range		T_J, T_{stg}	-55 to 150	$^\circ\text{C}$

Thermal Characteristic

Parameter		Symbol	Max.	Unit
Thermal resistance, junction-to-case	Steady state	$R_{\theta JC}$	3.8	$^\circ\text{C/W}$
Thermal resistance, junction-to-ambient ⁽⁴⁾	Steady state	$R_{\theta JA}$	60	

**Electrical characteristics (Ta=25°C ± 3°C)**

Parameter	Symbol	Test conditions	Min.	Typ.	Max.	Unit
Static parameter ⁽⁴⁾						
Drain to source breakdown voltage	V _{(BR)DSS}	V _{GS} = 0 V, I _D = -250 μA	-40			V
Gate-source threshold voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = -250 μA	-1.1	-1.6	-2.2	V
Gate-body leakage	I _{GSS}	V _{DS} = 0 V, V _{GS} = ±20 V			±100	nA
Zero gate voltage drain current	I _{DSS}	V _{DS} = -32 V, V _{GS} = 0 V			-1	μA
Drain-source on-resistance	R _{DS(on)}	V _{GS} = -10V, I _D = -20 A		30	33	mΩ
		V _{GS} = -4.5V, I _D = -15 A		39	50	mΩ
Forward transconductance	g _{fs}	V _{DS} = -5.0V, I _D = -30 A		20		S
Gate resistance	R _g	V _{GS} = 0V, V _{DS} = 0V, f = 1MHz		5.5		Ω
Dynamic ⁽⁵⁾						
Total gate charge	Q _g	V _{DS} = -15V, I _D = -5A V _{GS} = -10V		11		nC
Gate-source charge	Q _{gs}			3.2		
Gate-drain charge	Q _{gd}			5.1		
Turn-on delay time	t _{d(on)}	V _{GS} = -10V, V _{DS} = -20V I _D = -5 A, R _G = 3 Ω		13		ns
Rise time	t _r			11		
Turn-off delay time	t _{d(off)}			21		
Fall time	t _f			12		
Input capacitance	C _{iss}	V _{DS} = -20 V, V _{GS} = 0 V, f = 1 MHz		1080		pF
Output capacitance	C _{oss}			98		
Reverse transfer capacitance	C _{rss}			85		
Reverse Diode Characteristics ⁽⁵⁾						
Diode forward voltage	V _{SD}	V _{GS} = 0 V, I _F = -1 A		0.8	1.1	V
Reverse recovery time	t _{rr}	I _F = -20 A, di/dt = 100 A/μs		24		ns
Reverse recovery charge	Q _{rr}			15		nC

Notes

1. The data tested by surface mounted on a 1 inch² FR-4 board with 20Z copper.
2. The data tested by pulsed , pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 2\%$.
3. The EAS data shows Max. rating . The test condition is $V_{DD}=-25\text{ V}$, $V_{GS}=-10\text{ V}$, $L=0.1\text{ mH}$.
4. Short duration pulse test used to minimize self-heating effect.
5. Defined by design, not subject to production.

Electrical characteristics diagrams

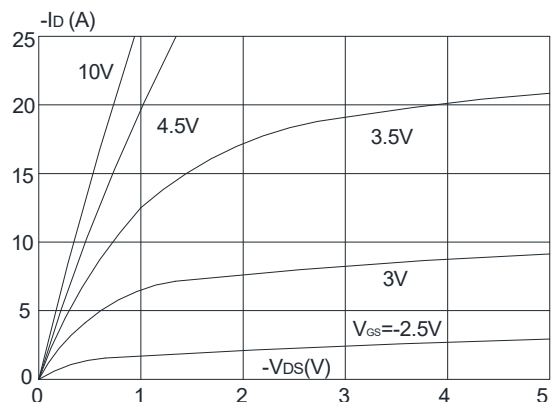


Figure 1: Output Characteristics

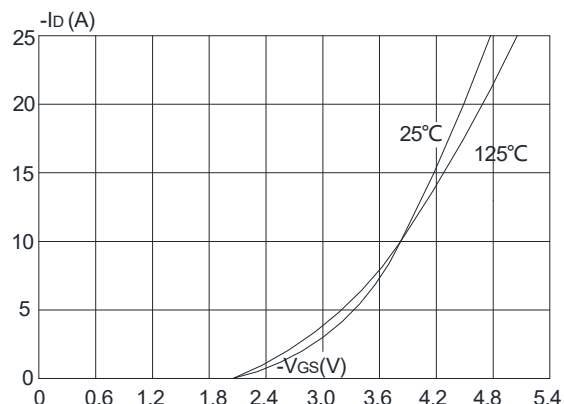


Figure 2: Typical Transfer Characteristics

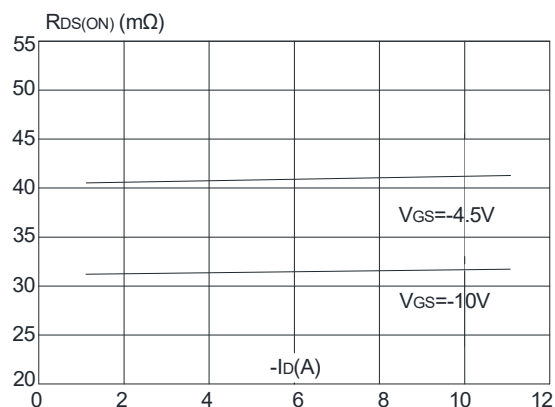


Figure 3: On-resistance vs. Drain Current

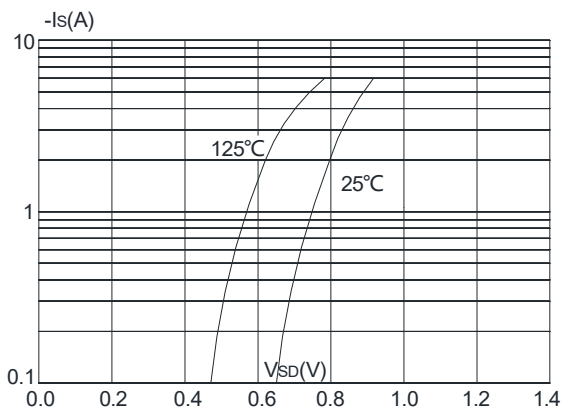


Figure 4: Body Diode Characteristics

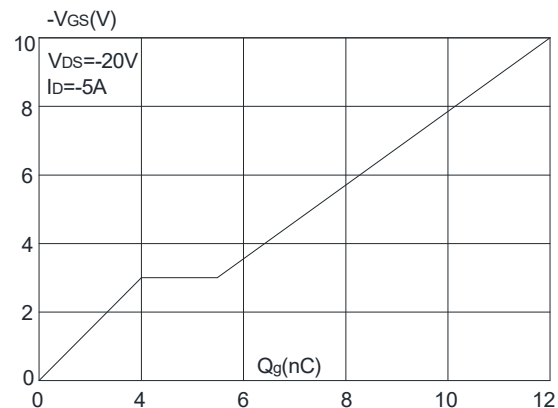


Figure 5: Gate Charge Characteristics

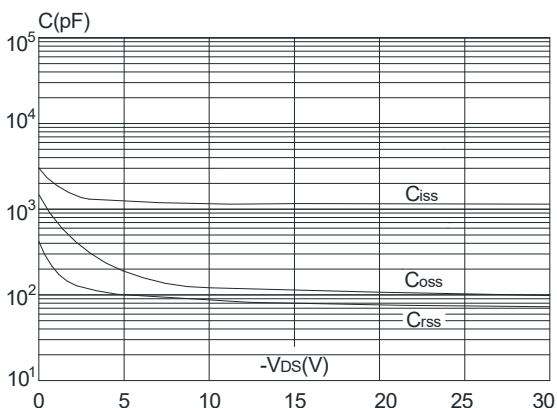


Figure 6: Capacitance Characteristics

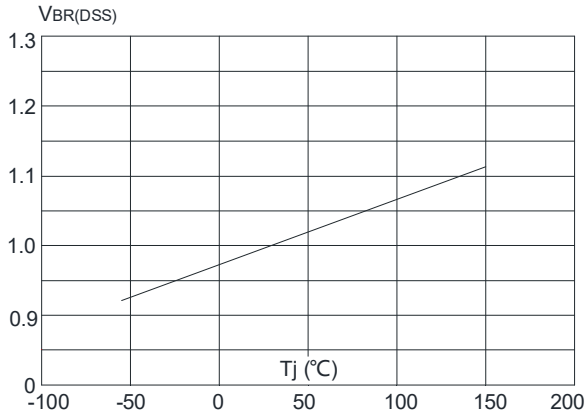
Electrical characteristics diagrams


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

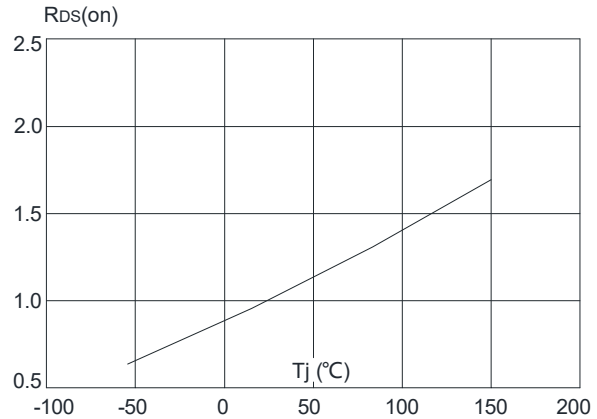


Figure 8: Normalized on Resistance vs. Junction Temperature

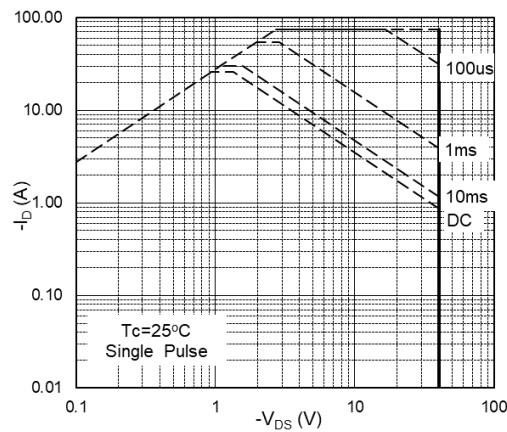


Figure 9: Maximum Safe Operating Area

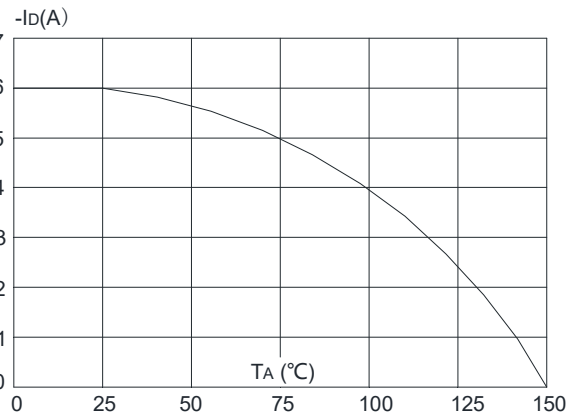


Figure 10: Maximum Continuous Drain Current vs. Ambient Temperature

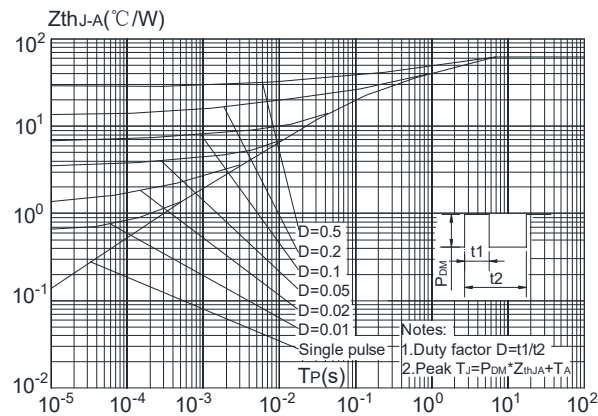
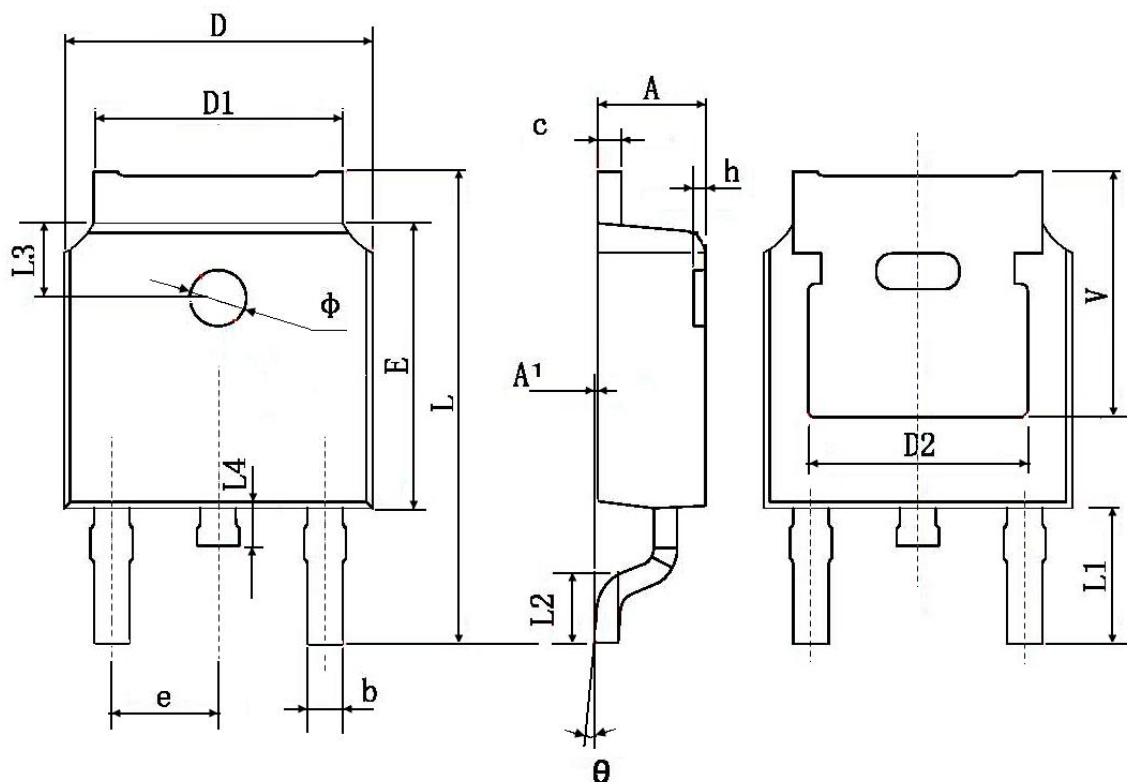


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

Package outline dimensions TO-252


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 TYP.		0.190 TYP.	
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 TYP.		0.114 TYP.	
L2	1.400	1.700	0.055	0.067
L3	1.600 TYP.		0.063 TYP.	
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.	

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