

P-Channel Enhancement Mode Power MOSFET

Description

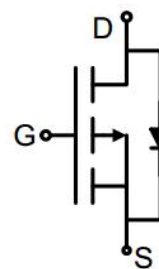
The GT1K2P15M uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge. It can be used in a wide variety of applications.

General Features

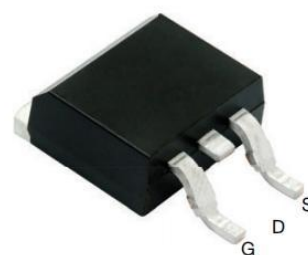
- V_{DS} -150V
- I_D (at $V_{GS} = -10V$) -27A
- $R_{DS(ON)}$ (at $V_{GS} = -10V$) < 120m Ω
- $R_{DS(ON)}$ (at $V_{GS} = -4.5V$) < 130m Ω
- 100% Avalanche Tested
- RoHS Compliant

Application

- Power switch
- DC/DC converters



Schematic diagram



TO-263

Ordering Information

Device	Package	Marking	Packaging
GT1K2P15M	TO-263	GT1K2P15	800pcs/Reel

Absolute Maximum Ratings $T_C = 25^\circ\text{C}$, unless otherwise noted

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	-150	V
Continuous Drain Current	I_D	-27	A
Pulsed Drain Current (note1)	I_{DM}	-108	A
Gate-Source Voltage	V_{GS}	± 20	V
Power Dissipation	P_D	138	W
Single pulse avalanche energy (note2)	E_{AS}	156	mJ
Operating Junction and Storage Temperature Range	T_J, T_{stg}	-55 To 150	$^\circ\text{C}$

Thermal Resistance

Parameter	Symbol	Value	Unit
Thermal Resistance, Junction-to-Ambient	R_{thJA}	50	$^\circ\text{C/W}$
Maximum Junction-to-Case	R_{thJC}	0.9	$^\circ\text{C/W}$

Specifications $T_J = 25^\circ\text{C}$, unless otherwise noted

Parameter	Symbol	Test Conditions	Value			Unit
			Min.	Typ.	Max.	
Static Parameters						
Drain-Source Breakdown Voltage	V _{(BR)DSS}	V _{GS} = 0V, I _D = -250μA	-150	--	--	V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = -150V, V _{GS} = 0V	--	--	-1	μA
Gate-Source Leakage	I _{GSS}	V _{GS} = ±20V	--	--	±100	nA
Gate-Source Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = -250μA	-1.0	-2.0	-3.0	V
Drain-Source On-Resistance	R _{DS(on)}	V _{GS} = -10V, I _D = -15A	--	95	120	mΩ
		V _{GS} = -4.5V, I _D = -15A	--	103	130	
Forward Transconductance	g _{FS}	V _{DS} = -5V, I _D = -15A	--	31	--	S
Dynamic Parameters						
Input Capacitance	C _{iss}	V _{GS} = 0V, V _{DS} = -75V, f = 1.0MHz	--	3186	--	pF
Output Capacitance	C _{oss}		--	131	--	
Reverse Transfer Capacitance	C _{rss}		--	8	--	
Total Gate Charge	Q _g	V _{DD} = -75V, I _D = -15A, V _{GS} = -10V	--	86	--	nC
Gate-Source Charge	Q _{gs}		--	9	--	
Gate-Drain Charge	Q _{gd}		--	19	--	
Turn-on Delay Time	t _{d(on)}	V _{DD} = -75V, I _D = -15A, R _G = 1.6Ω	--	62	--	ns
Turn-on Rise Time	t _r		--	17	--	
Turn-off Delay Time	t _{d(off)}		--	68	--	
Turn-off Fall Time	t _f		--	29	--	
Drain-Source Body Diode Characteristics						
Continuous Body Diode Current	I _S	T _C = 25°C	--	--	-27	A
Body Diode Voltage	V _{SD}	T _J = 25°C, I _{SD} = -15A, V _{GS} = 0V	--	--	-1.2	V
Reverse Recovery Charge	Q _{rr}	I _F = -15A, V _{GS} = 0V di/dt=-100A/us	--	362	--	nC
Reverse Recovery Time	T _{rr}		--	88	--	ns

Notes

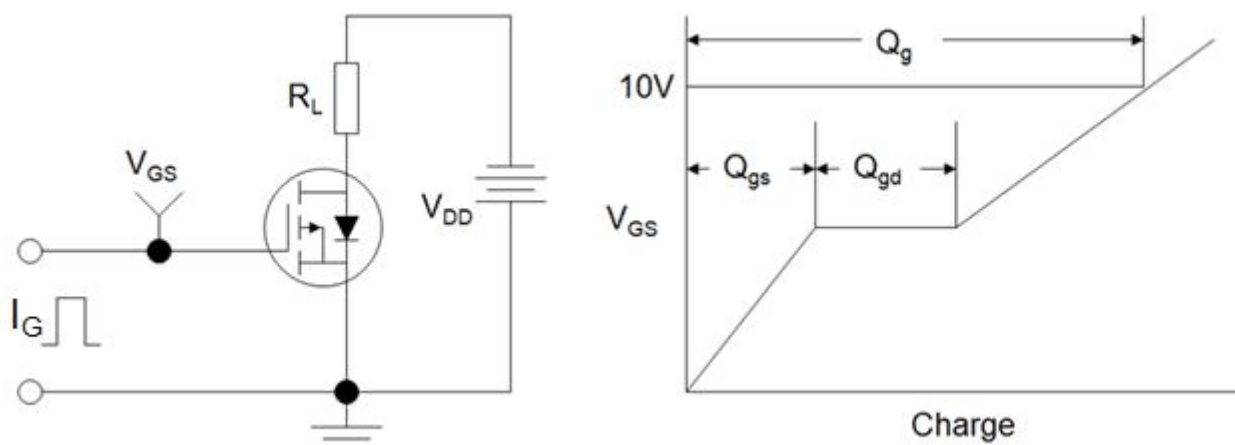
1. Repetitive Rating: Pulse width limited by maximum junction temperature

2. EAS condition : $T_J = 25^\circ\text{C}$, $V_{DD} = -50V$, $V_{GS} = -10V$, $L = 0.5mH$, $R_G = 25\Omega$

The table shows the minimum avalanche energy, which is 420mJ when the device is tested until failure

3. Identical low side and high side switch with identical R_G

Gate Charge Test Circuit



Switch Time Test Circuit



EAS Test Circuit



Typical Characteristics $T_J = 25^\circ\text{C}$, unless otherwise noted

Figure 1. Output Characteristics

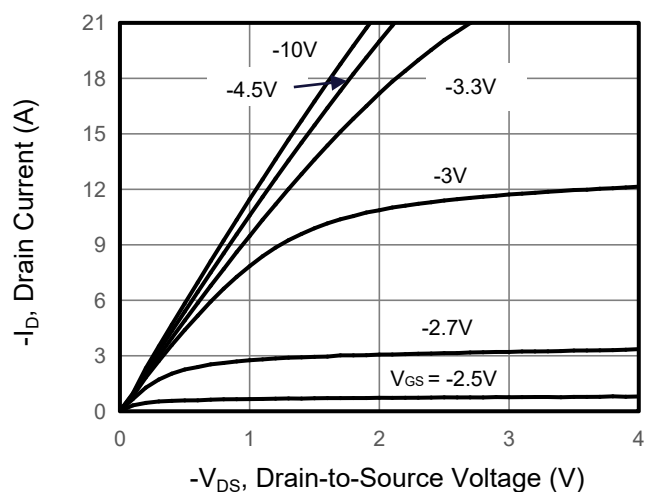


Figure 2. Transfer Characteristics

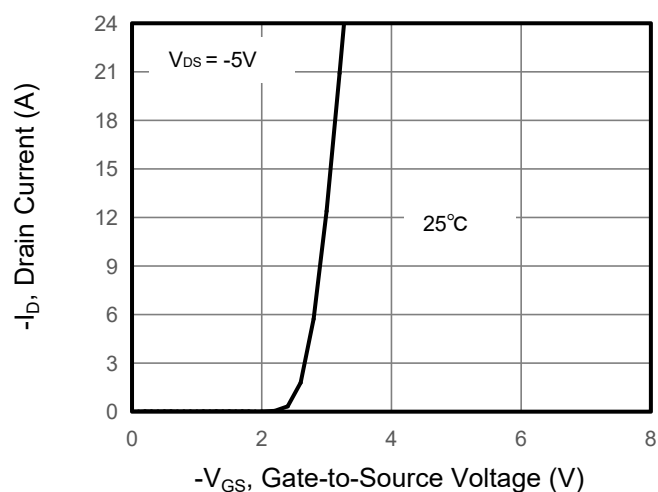


Figure 3. Drain Source On Resistance

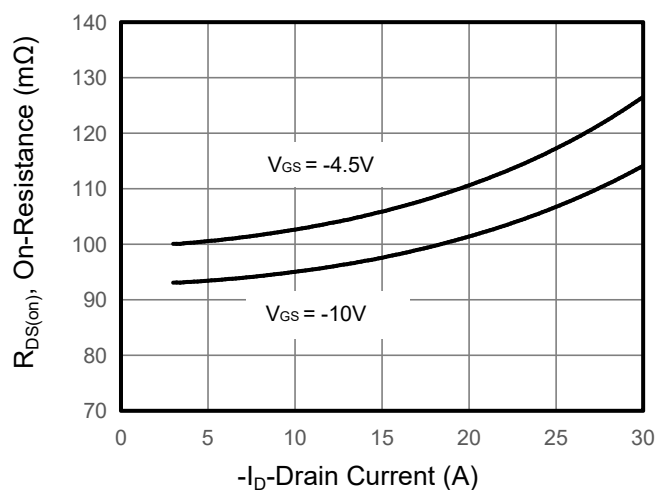


Figure 4. Gate Charge

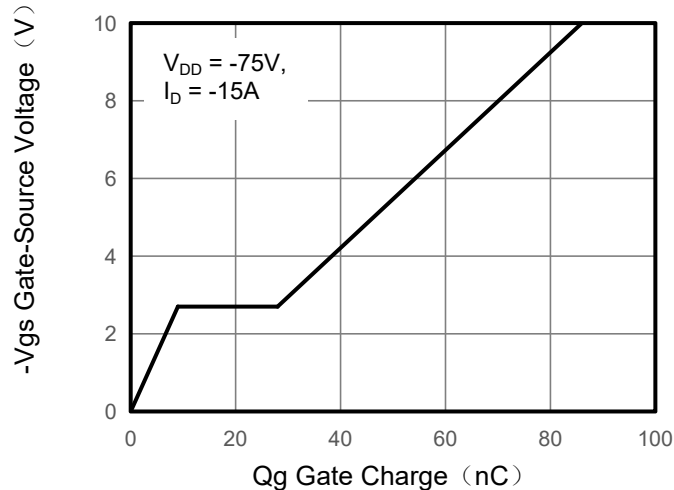


Figure 5. Capacitance

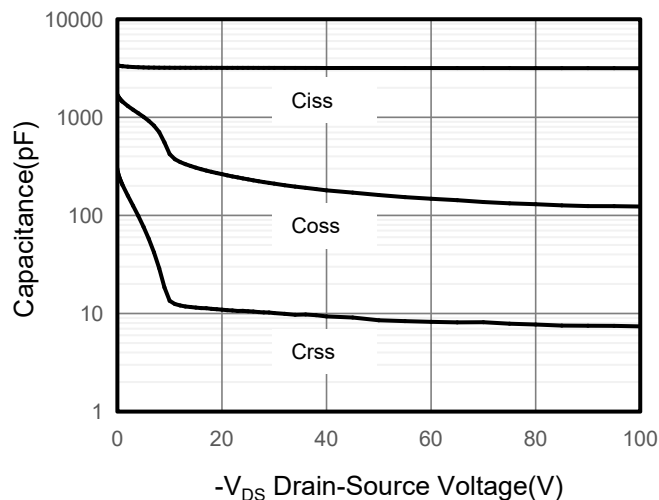
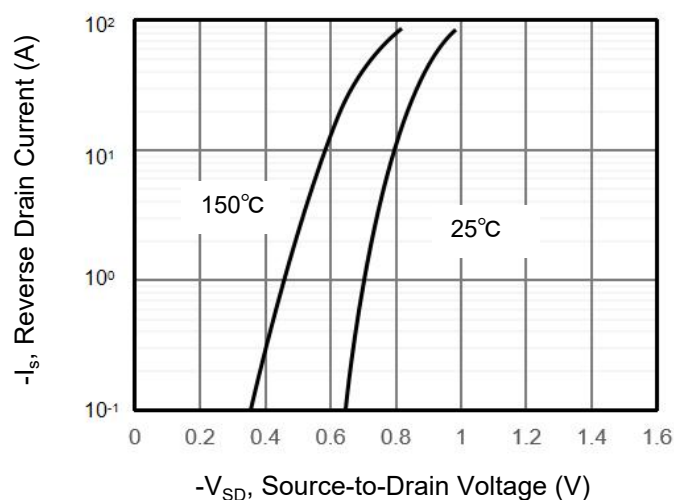


Figure 6. Source-Drain Diode Forward



Typical Characteristics $T_J = 25^\circ\text{C}$, unless otherwise noted

Figure 7. Drain-Source On-Resistance

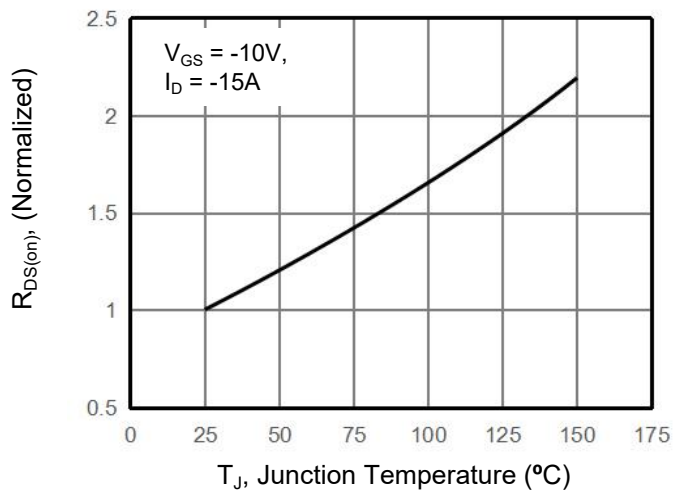


Figure 10. Safe Operation Area

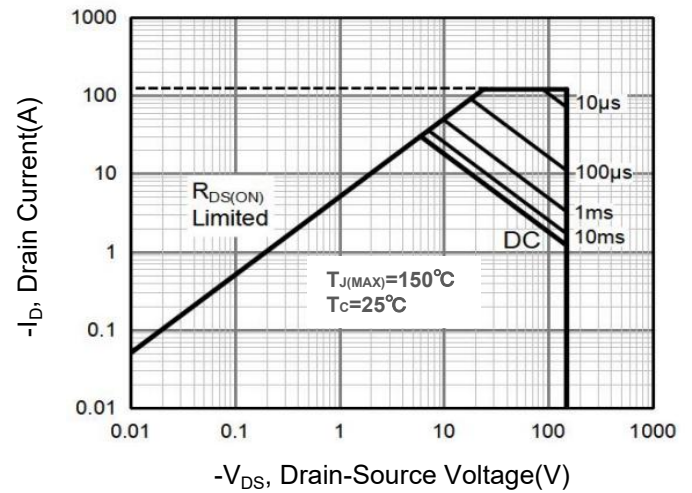
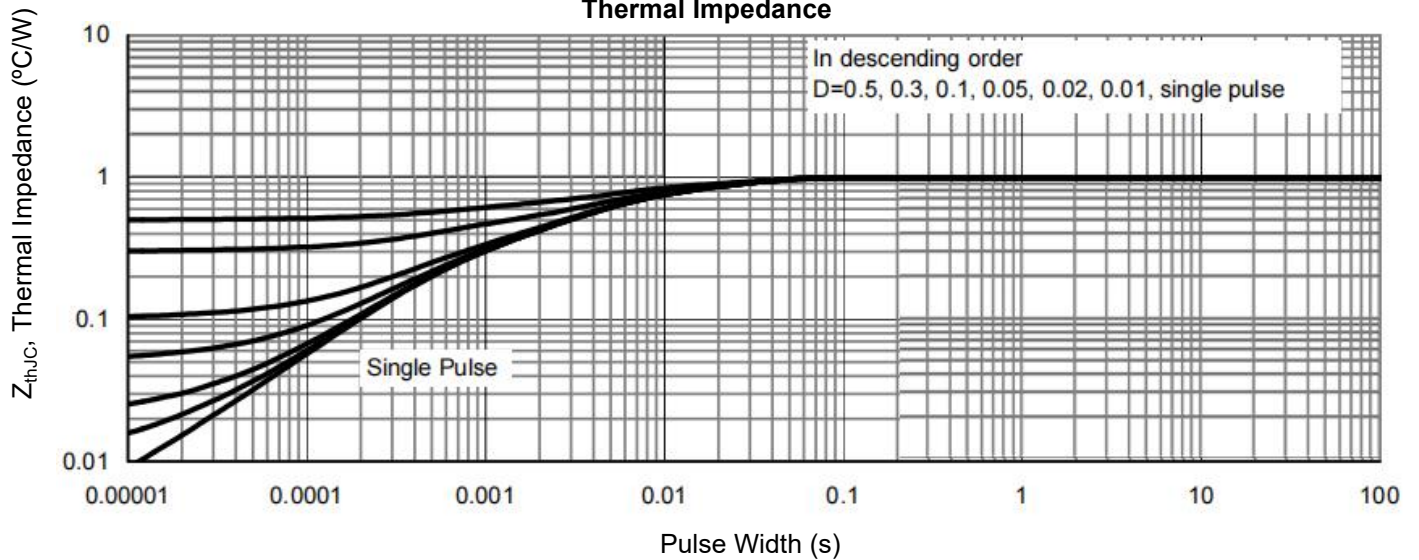
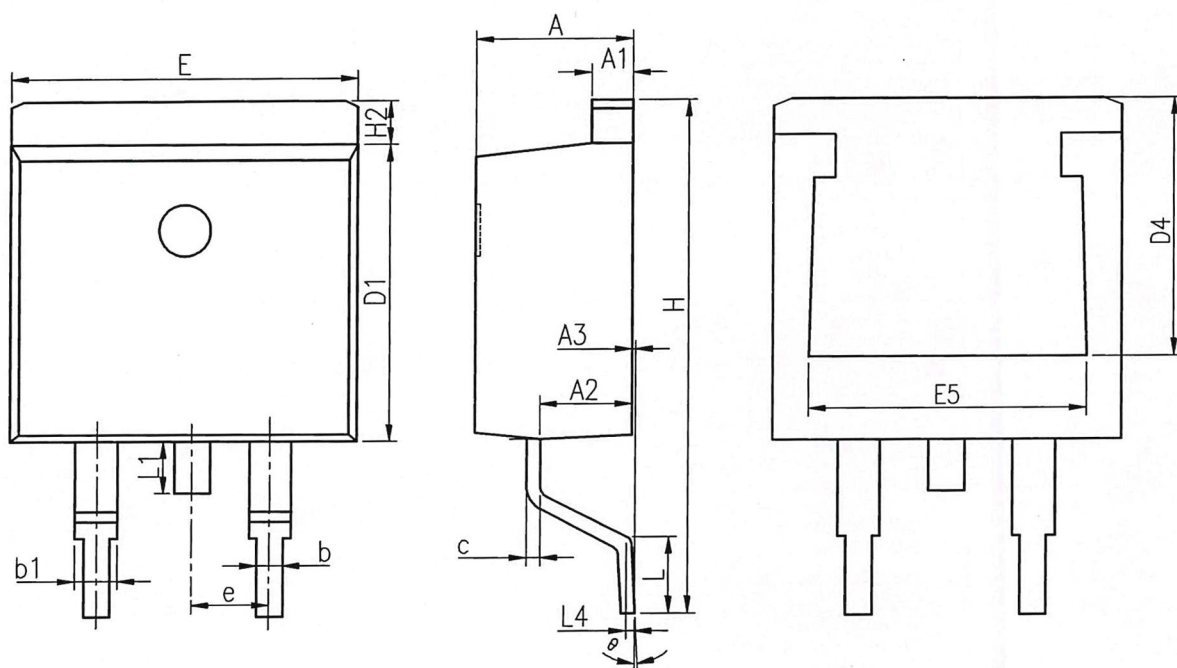


Figure 9. Normalized Maximum Transient Thermal Impedance



TO-263 Package Information



COMMON DIMENSIONS

SYMBOL	MM			SYMBOL	MM		
	MIN	NOM	MAX		MIN	NOM	MAX
A	4.37	4.57	4.77	E	9.86	10.16	10.36
A1	1.22	1.27	1.42	E5	7.06	-	-
A2	2.49	2.69	2.89	e	2.54 BSC		
A3	0.00	0.13	0.25	H	14.70	15.10	15.50
b	0.70	0.81	0.96	H2	1.07	1.27	1.47
b1	1.17	1.27	1.47	L	2.00	2.30	2.60
c	0.30	0.38	0.53	L1	1.40	1.55	1.70
D1	8.50	8.70	8.90	L4	0.25 BSC		
D4	6.60	-	-	θ	0°	5°	9°