

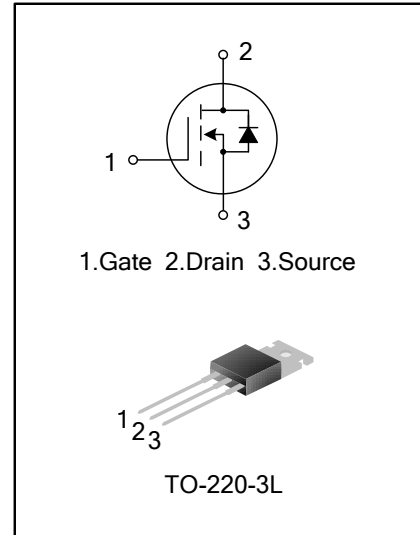
162A, 40V, N-Channel MOSFET

General Description

GGVD1404T is an N-channel enhancement mode MOS field effect transistor. The improved planar stripe cell and the improved guard ring terminal have been especially tailored to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode. Optimization of the parasitic parameters of the device and enhancement of the anti-jamming capability of the gate make it easy to use in parallel.

Features

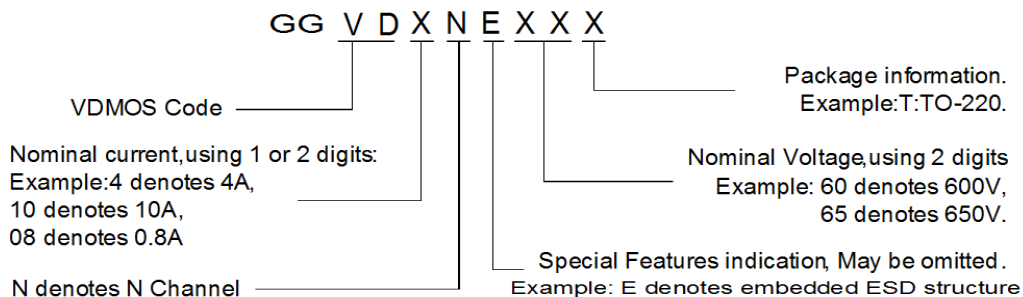
- 162A, 40V
- $R_{DS(on)(typ)} = 3.5m\Omega @ V_{GS} = 10V$
- Low gate charge
- Low C_{rss}
- Fast switching
- Improved dv/dt capability



Applications

- AC-DC power supplies
- DC-DC converters
- H-bridge PWM motor drivers

Nomenclature



Ordering Information

Part No.	Package	Marking	Material	Packing
GGVD1404T	TO-220-3L	GGVD1404T	Pb free	Tube

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

Characteristics	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	40	V
Gate-Source Voltage	V_{GS}	± 20	V
Drain Current	I_D	$T_C=25^{\circ}\text{C}$	A
		$T_C=100^{\circ}\text{C}$	
Drain Current Pulsed	I_{DM}	650	A
Power Dissipation($T_C=25^{\circ}\text{C}$) -Derate above 25°C	P_D	200	W
		1.3	W/ $^{\circ}\text{C}$
Single Pulsed Avalanche Energy (Note 1)	E_{AS}	519	mJ
Operation Junction Temperature Range	T_J	$-55\sim+150$	$^{\circ}\text{C}$
Storage Temperature Range	T_{stg}	$-55\sim+150$	$^{\circ}\text{C}$

Thermal Characteristics

Characteristics	Symbol	Rating	Unit
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	0.75	$^{\circ}\text{C/W}$
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	62	$^{\circ}\text{C/W}$

Electrical Characteristics ($T_C=25^{\circ}\text{C}$ unless otherwise noted)

Characteristics	Symbol	Test conditions	Min.	Typ.	Max.	Unit
Drain –Source Breakdown Voltage	$B_{V_{DS}}$	$V_{GS}=0\text{V}, I_D=250\mu\text{A}$	40	--	--	V
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=40\text{V}, V_{GS}=0\text{V}$	--	--	20	μA
Gate-Source Leakage Current	I_{GSS}	$V_{GS}=\pm 20\text{V}, V_{DS}=0\text{V}$	--	--	± 200	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{GS}=V_{DS}, I_D=250\mu\text{A}$	2.0	--	4.0	V
Static Drain- Source On State Resistance	$R_{DS(on)}$	$V_{GS}=10\text{V}, I_D=81\text{A}$	--	3.5	4.0	$\text{m}\Omega$
Input Capacitance	C_{iss}	$V_{DS}=25\text{V}, V_{GS}=0\text{V},$ $f=1.0\text{MHz}$	--	7360	--	pF
Output Capacitance	C_{oss}		--	1680	--	
Reverse Transfer Capacitance	C_{rss}		--	240	--	
Turn-on Delay Time	$t_{d(on)}$	$V_{DD}=20\text{V}, V_{GS}=25\text{V},$ $R_G=50\Omega$	--	17	--	ns
Turn-on Rise Time	t_r		--	140	--	
Turn-off Delay Time	$t_{d(off)}$		--	72	--	
Turn-off Fall Time	t_f		--	26	--	
Total Gate Charge	Q_g	$V_{DS}=32\text{V}, I_D=162\text{A},$ $V_{GS}=10\text{V}$	--	160	200	nC
Gate-Source Charge	Q_{gs}		--	35	--	
Gate-Drain Charge	Q_{gd}		--	42	60	

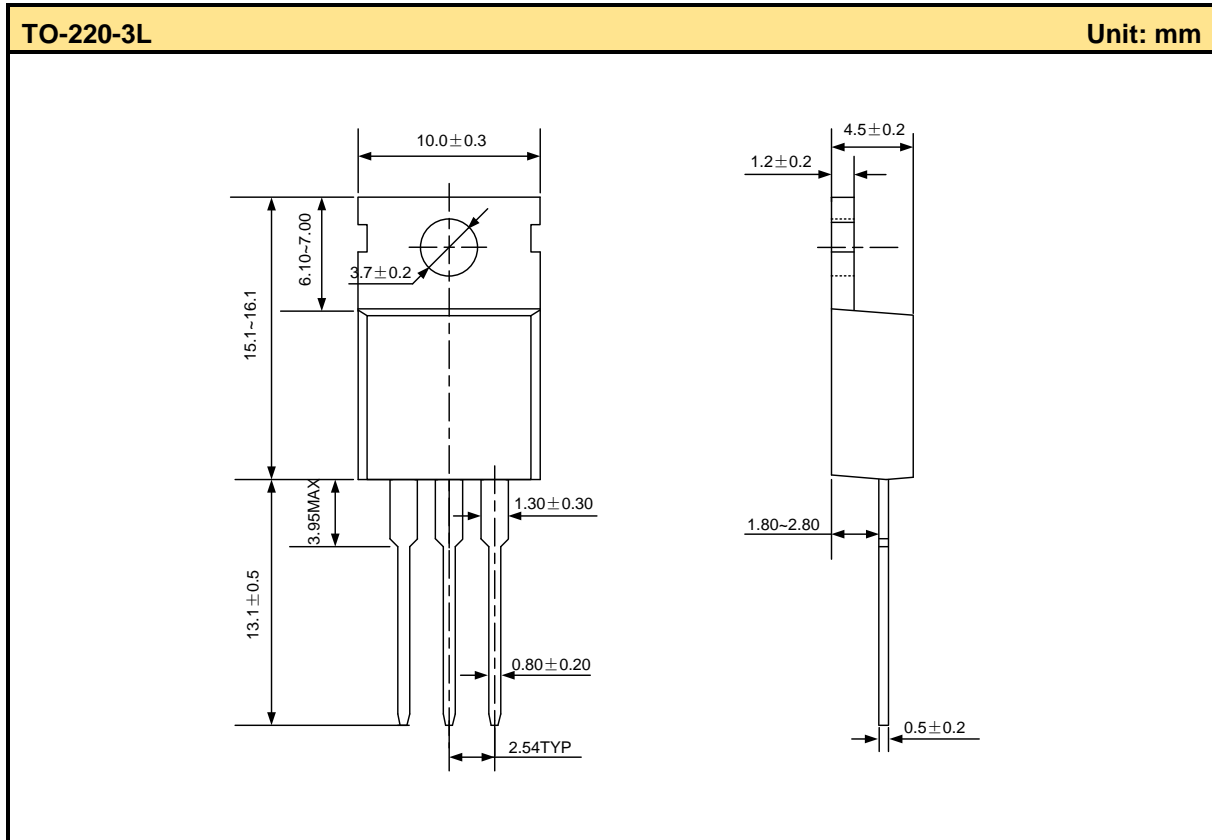
Source-Drain Diode Ratings and Characteristics

Characteristics	Symbol	Test conditions	Min.	Typ.	Max.	Unit
Continuous Source Current	I_S	Integral Reverse P-N Junction Diode in the MOSFET	--	--	162	A
Pulsed Source Current	I_{SM}		--	--	650	
Diode Forward Voltage	V_{SD}	$I_S=162A, V_{GS}=0V$	--	--	1.3	V
Reverse Recovery Time	T_{rr}	$I_S=162A, V_{GS}=0V,$ $dI_F/dt=100A/\mu s$ (Note 2)	--	71	110	ns
Reverse Recovery Charge	Q_{rr}		--	180	270	nC

Notes:

1. $L=120\mu H, I_{AS}=162A, V_{DD}=25V, R_G=0\Omega$, starting $T_J=25^\circ C$;
2. Pulse Test: Pulse width $\leq 300\mu s$, Duty cycle $\leq 2\%$;
3. Essentially independent of operating temperature.

Package Outline



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