

50N03

N-channel MOSFET



N-CHANNEL POWER MOSFET 50A, 30V N-CHANNEL ENHANCEMENT MODE POWER MOSFET

DESCRIPTION

The 50N03 meet the ROHS and Green Product requirement with full function reliability approved.

MARKING

* $R_{DS(ON)} \leq 12 \text{ m}\Omega$ @ $V_{GS}=4.5\text{V}$, $I_D=1\text{A}$

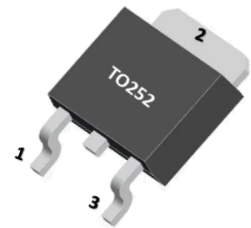
$R_{DS(ON)} \leq 16 \text{ m}\Omega$ @ $V_{GS}=10\text{V}$, $I_D=1\text{A}$

* Low capacitance

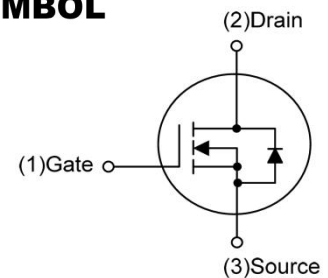
* Optimized gate charge

* Fast switching capability

* Avalanche energy specified



SYMBOL



ABSOLUTE MAXIMUM RATINGS($T_A=25^\circ\text{C}$, unless otherwise specified.)

SYMBOL	PARAMETER	VALUE	UNIT
V_{DSS}	Drain-Source Voltage	30	V
V_{GSS}	Gate-Source Voltage	±20	V
I_D	Continuous Drain Current	50	A
I_{DM}	Pulsed Drain Current (Note 2)	100	A
E_{AS}	Single Pulsed Avalanche Energy (Note 3)	66	mJ
P_D	Power Dissipation	40	W
T_j	Junction temperature	+150	°C
T_{stg}	Storage temperature	-55~+150	°C

Notes: 1. Absolute maximum ratings are those values beyond which the device could be permanently damaged. Absolute maximum ratings are stress ratings only and functional device operation is not implied.

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

3. $L = 0.05\text{mH}$, $I_{AS} = 51\text{A}$, $V_{DD} = 25\text{V}$, $R_G = 25 \Omega$, Starting $T_J = 25^\circ\text{C}$.

■ THERMAL DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	TO-252	θ_{JA}	50	$^{\circ}\text{C}/\text{W}$
Junction to Case	TO-252	θ_{JC}	3.13	$^{\circ}\text{C}/\text{W}$

Note: Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper plate.

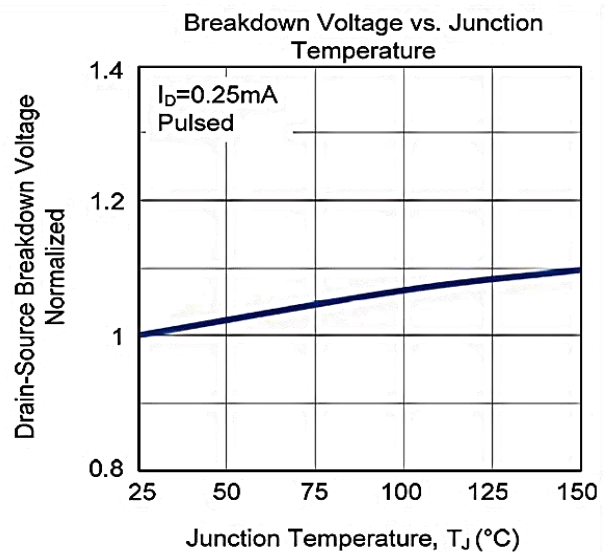
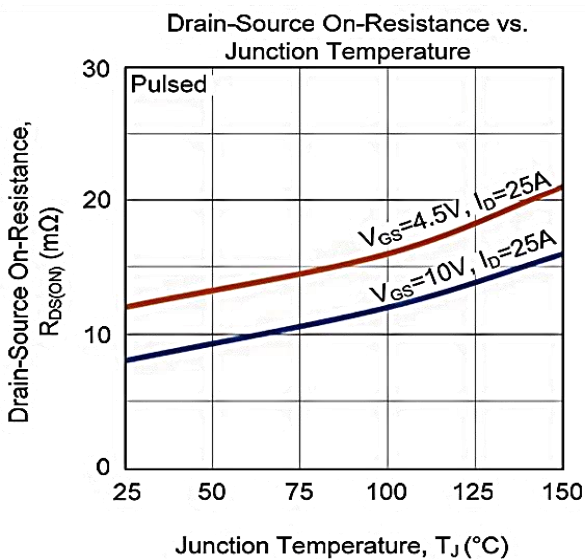
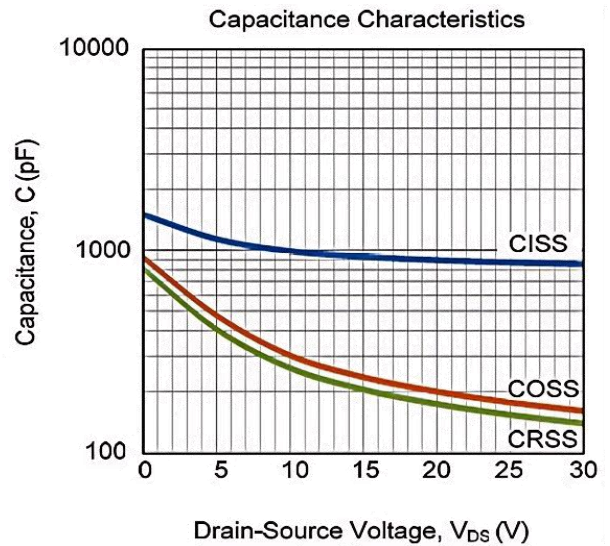
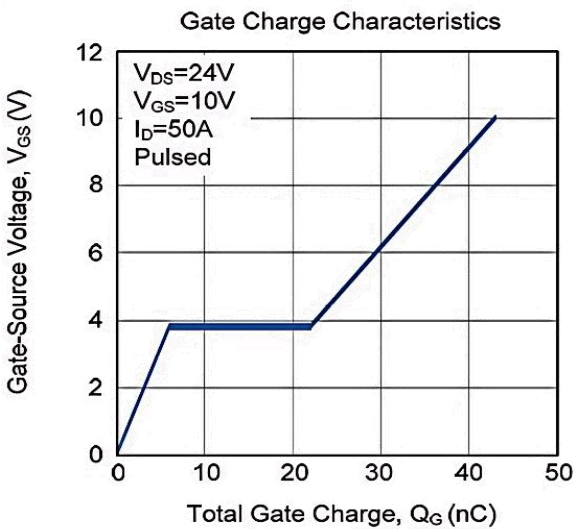
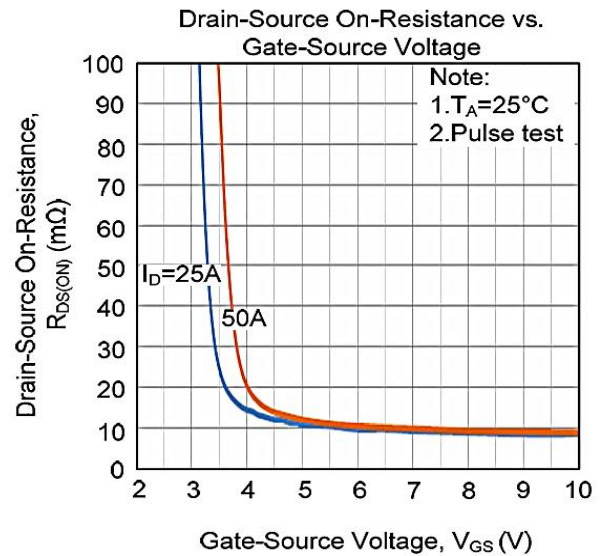
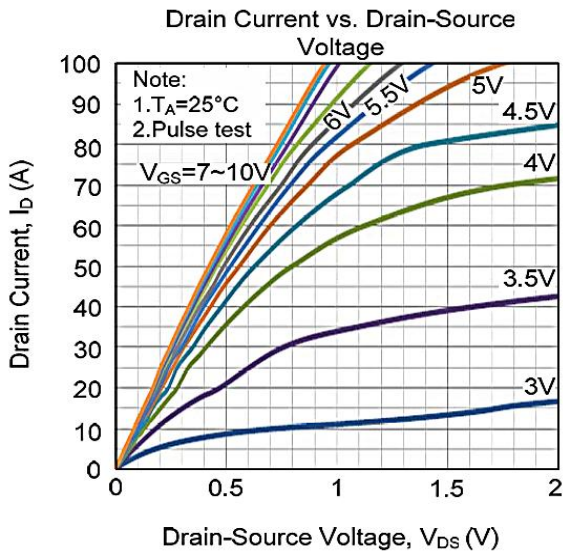
■ ELECTRICAL CHARACTERISTICS ($T_A=25^{\circ}\text{C}$, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu\text{A}$	30			V
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=30V, V_{GS}=0V$			1.5	μA
Gate- Source Leakage Current	I_{GSS}	$V_{GS}=\pm 12V, V_{DS}=0V$			± 100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS}=V_{GS}, I_D=250\mu\text{A}$	1.0	1.7	2.5	V
Static Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=25A$			10	m Ω
		$V_{GS}=4.5V, I_D=25A$			15	
DYNAMIC CHARACTERISTICS						
Input Capacitance	C_{ISS}	$V_{DS}=15V, V_{GS}=0V$ $f=1.0\text{MHz}$		940		pF
Output Capacitance	C_{OSS}			235		pF
Reverse Transfer Capacitance	C_{RSS}			200		pF
SWITCHING CHARACTERISTICS						
Total Gate Charge (Note 1)	Q_G	$V_{DS}=24V, V_{GS}=10V, I_D=50A$		43		nC
Gate-Source Charge	Q_{GS}			6		nC
Gate-Drain Charge	Q_{GD}			16		nC
Turn-On Delay Time (Note 1)	$t_{D(ON)}$	$V_{DS}=15V, I_D=50A, V_{GS}=10V$ $R_G=3\Omega$		8		ns
Turn-On Rise Time	t_R			17		ns
Turn-Off Delay Time	$t_{D(OFF)}$			25		ns
Turn-Off Fall Time	t_F			23		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Maximum Continuous Drain-Source Diode Forward Current	I_S				45	A
Drain-Source Diode Forward Voltage	V_{SD}	$I_S=50A, V_{GS}=0V$			1.4	V
Reverse Recovery Time	t_{rr}	$I_S=30A, V_{GS}=0V, di/dt=100A/\mu\text{s}$		164		ns
Reverse Recovery Charge	Q_{rr}			300		nC

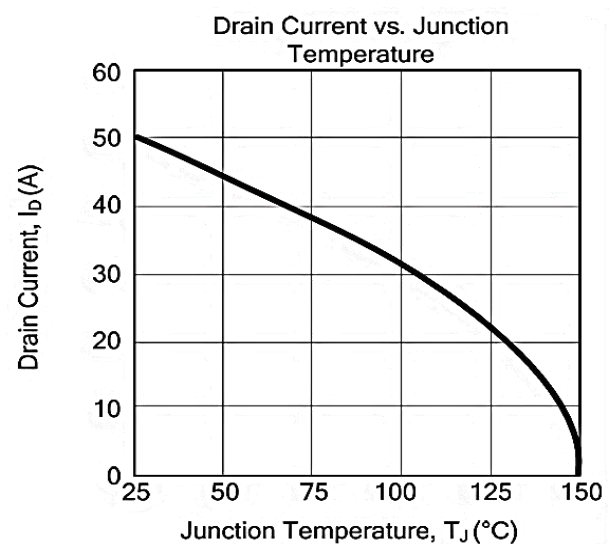
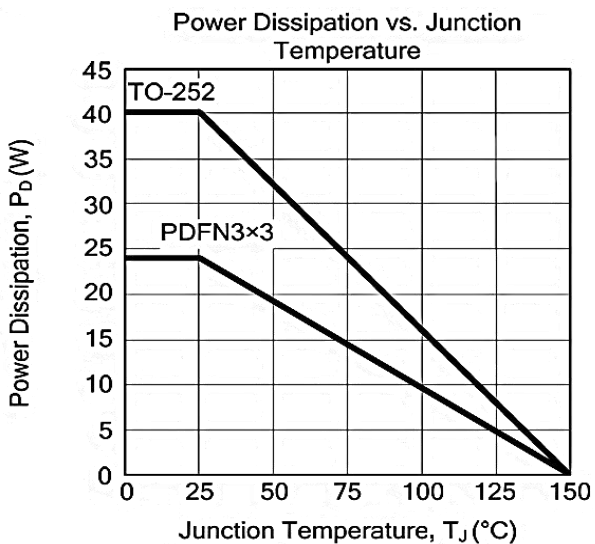
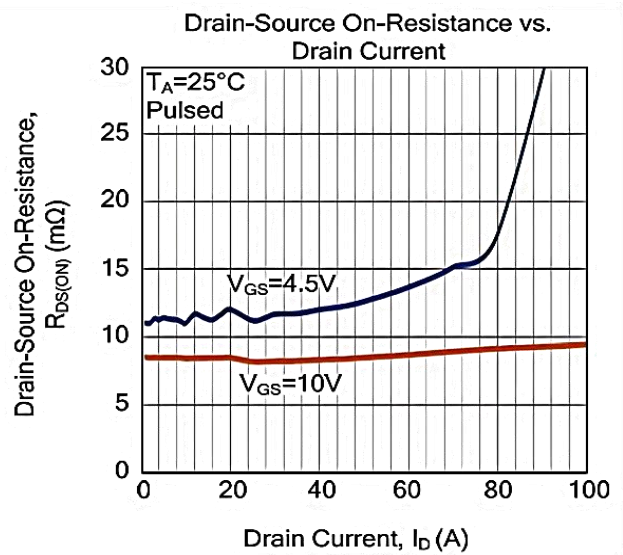
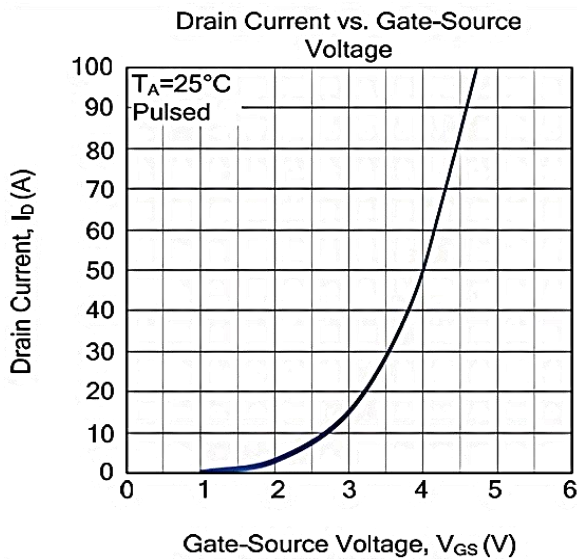
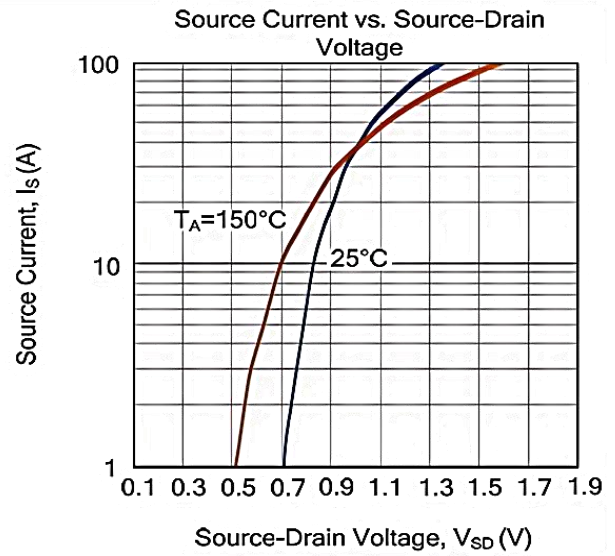
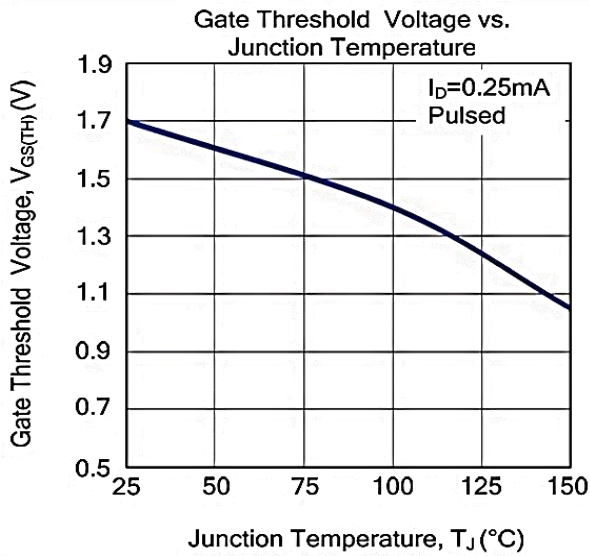
Notes:

1. Pulse width limited by $T_J(\text{MAX})$
2. Pulse Test: Pulse Width $\leq 300\mu\text{s}$, Duty Cycle $\leq 2\%$

■ TYPICAL CHARACTERISTICS (1)



TYPICAL CHARACTERISTICS (Con.t)



50N03

N-channel MOSFET



TO - 252 Package Outline Dimensions

