



60V N-CHANNEL ENHANCEMENT MODE MOSFET

Product Summary

BV _{DSS}	R _{DS(ON)} max	I _D T _C = +25°C (Note 9)
60V	$3.65 \text{m}\Omega @ V_{GS} = 10V$	100A

Description and Applications

This new generation MOSFET features low on-resistance and fast switching, making it ideal for high-efficiency power management applications.

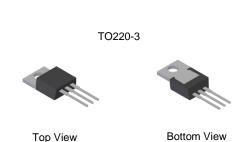
- Engine Management Systems
- Body Control Electronics
- DC-DC Converters

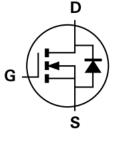
Features

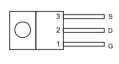
- 100% Unclamped Inductive Switching Ensures More Reliable and Robust End Application
- Low Input Capacitance
- Low Input/Output Leakage
- Lead-Free Finish; RoHS Compliant (Notes 1 & 2)
- Halogen and Antimony Free. "Green" Device (Note 3)
- Qualified to AEC-Q101 Standards for High Reliability

Mechanical Data

- Case: TO220-3
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Terminals: Matte Tin Finish Annealed over Copper Leadframe. Solderable per MIL-STD-202, Method 208 (3)
- Terminal Connections: See Diagram Below
- Weight: 1.85 grams (Approximate)







Equivalent Circuit

Top View Pin Out Configuration

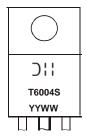
Ordering Information (Note 4)

Part Number	Case	Packaging
DMT6004SCT	TO220-3	50 pieces/tube

Notes:

- 1. EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant. All applicable RoHS exemptions applied.
- See http://www.diodes.com/quality/lead_free.html for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
- 3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
- 4. For packaging details, go to our website at http://www.diodes.com/products/packages.html.

Marking Information



The Manufacturer's Marking
T6004S = Product Type Marking Code
YYWW = Date Code Marking
YY or YY = Last Two Digits of Year (ex: 15 = 2015)
WW or WW = Week Code (01 to 53)



Maximum Ratings (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Units		
Drain-Source Voltage	V_{DSS}	60	V		
Gate-Source Voltage	V_{GSS}	±20	V		
Continuous Drain Current (Note 6)	T _C = +25°C (Note 9)	ID	100	А	
, ,	$T_C = +70$ °C	_	100		
Maximum Continuous Body Diode Forward Current (Note 6)	T _C = +25°C	I _S	100	Α	
Pulsed Drain Current (10µs pulse, duty cycle = 1%)	I _{DM}	180	Α		
Avalanche Current, L=0.2mH	I _{AS}	45	Α		
Avalanche Energy, L=0.2mH	Eas	200	mJ		

Thermal Characteristics

Characteristic		Symbol	Value	Units
Total Power Dissipation (Note 5)	$T_A = +25^{\circ}C$	P_D	2.3	W
Thermal Resistance, Junction to Ambient (Note 5)		$R_{ heta JA}$	52.8	°C/W
Total Power Dissipation (Note 6)	$T_C = +25$ °C	P_{D}	113	W
Thermal Resistance, Junction to Case (Note 6)		$R_{ heta JC}$	1.1	°C/W
Operating and Storage Temperature Range		T _{J,} T _{STG}	-55 to +150	°C

Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

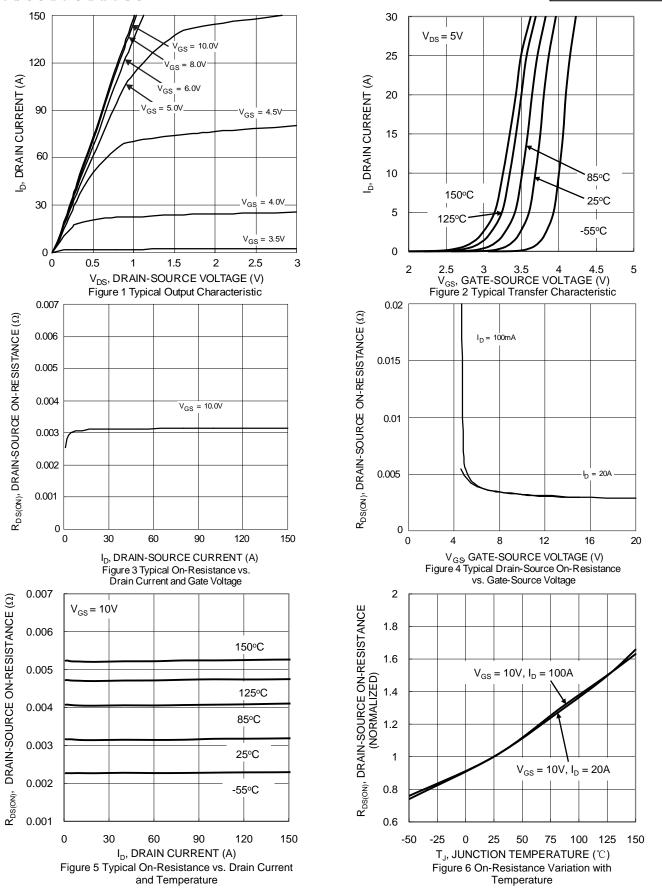
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Characteristic	Symbol	Min	Тур	Max	Unit	Test Condition	
OFF CHARACTERISTICS (Note 7)							
Drain-Source Breakdown Voltage	BV _{DSS}	60	_		V	$V_{GS} = 0V$, $I_D = 1mA$	
Zero Gate Voltage Drain Current	I _{DSS}	_	_	1	μΑ	$V_{DS} = 48V$, $V_{GS} = 0V$	
Gate-Source Leakage	IGSS	_	_	±100	nA	$V_{GS} = \pm 20V$, $V_{DS} = 0V$	
ON CHARACTERISTICS (Note 7)							
Gate Threshold Voltage	V _{GS(TH)}	2	_	4	V	$V_{DS} = V_{GS}$, $I_D = 250\mu A$	
Static Drain-Source On-Resistance	R _{DS(ON)}	1	3.1	3.65	mΩ	$V_{GS} = 10V, I_D = 100A$	
Diode Forward Voltage	V_{SD}	1	_	1.3	V	$V_{GS} = 0V, I_{S} = 100A$	
DYNAMIC CHARACTERISTICS (Note 8)							
Input Capacitance	C _{iss}	_	4556	_		$V_{DS} = 30V$, $V_{GS} = 0V$, $f = 1MHz$	
Output Capacitance	Coss	_	1383	_	pF		
Reverse Transfer Capacitance	C _{rss}	_	105	_			
Gate Resistance	R_{G}	_	0.7	_	Ω	$V_{DS} = 0V$, $V_{GS} = 0V$, $f = 1MHz$	
Total Gate Charge	Qg	_	95.4	_		V _{DD} = 30V, I _D = 90A, V _{GS} = 10V	
Gate-Source Charge	Qgs	_	21.6	_	nC		
Gate-Drain Charge	Q_{gd}	_	20.4	_		VGS = 10V	
Turn-On Delay Time	t _{D(ON)}	_	14.3	_		$V_{DD} = 30V, V_{GS} = 10V,$ $I_{D} = 90A, R_{G} = 3.5\Omega$	
Turn-On Rise Time	t _R	_	99.1	_	ns		
Turn-Off Delay Time	t _{D(OFF)}	1	40	_	115		
Turn-Off Fall Time	t _F	1	17.6	_			
Reverse Recovery Time	t _{RR}	_	50.5	_	ns	1 48A di/dt 400A/vo	
Reverse Recovery Charge	Q_{RR}	_	80.8	_	nC	$I_F = 48A$, di/dt = 100A/ μ s	

Notes: 5. Device mounted on FR-4 PC board, with minimum recommended pad layout, single sided.

- 6. Device mounted on infinite heat sink.
- Short duration pulse test used to minimize self-heating effect.
 Guaranteed by design. Not subject to product testing.
 Package limited.

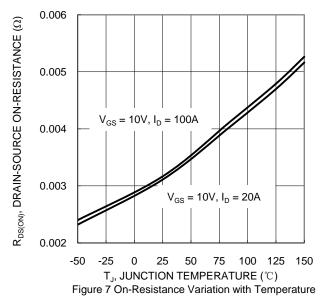


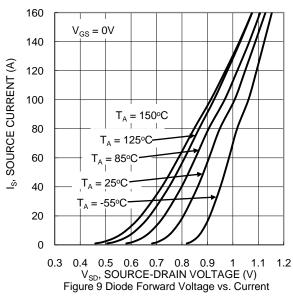


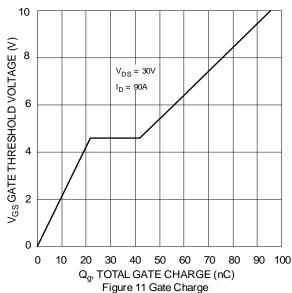


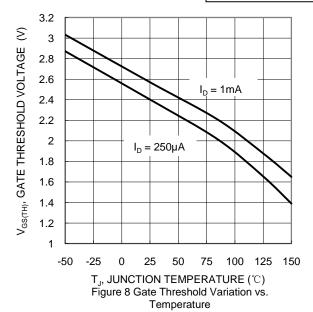


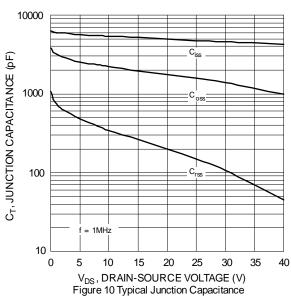


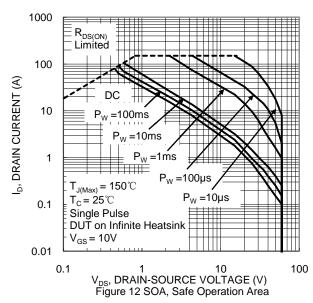














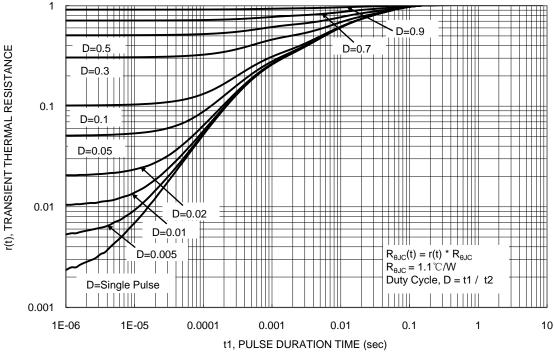
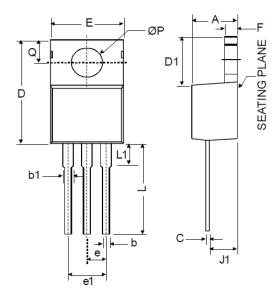


Figure 13 Transient Thermal Resistance

Package Outline Dimensions

Please see http://www.diodes.com/package-outlines.html for the latest version.

TO220-3



TO220-3					
Dim	Min	Max			
Α	3.55	4.85			
b	0.51	1.14			
b1	1.14	1.78			
С	0.31	1.14			
D	14.20	16.50			
D1	5.84	6.86			
Е	9.70	10.70			
e	2.79	2.99			
e1	4.83	5.33			
F	0.51	1.40			
J1	2.03	2.92			
L	12.72	14.72			
L1	3.66	6.35			
Ρ	3.53	4.09			
ø	2.54	3.43			
All Dimensions in mm					



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