

1200V N-Channel Depletion Mode Power FET

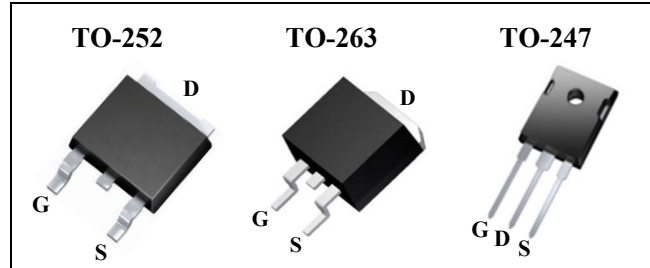
General Features

- Depletion Mode (Normally-on)
- High Breakdown Voltage:1200V
- Extremely Fast Switching
- Low Gate Charge
- Low Intrinsic Capacitance
- RoHS Compliant
- Halogen-free Available

BV_{DSX}	$R_{DS(on)}(Typ.)$
1200V	160mΩ

Applications

- Over Current Protection Circuits
- DC-AC Inverters
- Switch Mode Power Supplies
- Power Factor Correction Modules
- Motor Drives
- Induction Heating



Ordering Information

Part Number	Package	Marking	Remark
DMD01R120A	TO-252	01R120	Halogen Free
DMB01R120A	TO-263	01R120	Halogen Free
DMW01R120A	TO-247	01R120	Halogen Free

Absolute Maximum Ratings

$T_A = 25^\circ\text{C}$ unless otherwise specified

Symbol	Parameter	DMD01R120A	DMB01R120A	DMW01R120A	Unit
V_{DSX}	Drain-to-Source Voltage ^[1]	1200			V
V_{DGX}	Drain-to-Gate Voltage ^[1]	1200			V
V_{GS}	Gate-to-Source Voltage(DC)	-20 to +2.5			V
I_D	Continuous Drain Current ^[2]	10	17	17	A
I_{DM}	Pulsed Drain Current ^[3]	30	35	35	A
P_D	Power Dissipation ^[4]	36	220	220	W
T_L	Soldering Temperature Distance of 1.6mm from case for 10 seconds	300			$^\circ\text{C}$
T_J & T_{STG}	Operating and Storage Temperature Range	-55 to 150			$^\circ\text{C}$

Caution: Stresses beyond those listed in the "Absolute Maximum Ratings" may cause permanent damage to the device.

Thermal Characteristics

Symbol	Parameter	DMD01R120A	DMB01R120A	DMW01R120A	Unit
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	3.47	0.57	0.57	$^\circ\text{C/W}$

Electrical Characteristics

OFF Characteristics

$T_A = 25^\circ\text{C}$ unless otherwise specified

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions
BV_{DSX}	Drain-to-Source Breakdown Voltage	1200	--	--	V	$V_{GS} = -20\text{V}$, $I_D = 1\text{mA}$
$I_{D(off)}$	Drain-to-Source Leakage Current	--	--	50	μA	$V_{DS} = 1200\text{V}$, $V_{GS} = -20\text{V}$
I_{GSS}	Gate-to-Source Leakage Current	--	--	-20	μA	$V_{GS} = -20\text{V}$, $V_{DS} = 0\text{V}$

ON Characteristics

$T_A = 25^\circ\text{C}$ unless otherwise specified

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions
$R_{DS(on)}$	Static Drain-to-Source On-Resistance	--	160	200	$\text{m}\Omega$	$V_{GS} = 0\text{V}$, $I_D = 14\text{A}$ [5]
$V_{GS(off)}$	Gate-to-Source Cut-off Voltage	-12.0	--	-6.0	V	$V_{DS} = 5\text{V}$, $I_D = 1\text{mA}$

Dynamic Characteristics

Essentially independent of operating temperature

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions
C_{iss}	Input Capacitance	--	450	--	pF	$V_{GS} = -20\text{V}$, $V_{DS} = 100\text{V}$, $f = 100\text{KHz}$
C_{oss}	Output Capacitance	--	52	--		
C_{rss}	Reverse Transfer Capacitance	--	47	--		
Q_g	Total Gate Charge	--	59	--	nC	$V_{GS} = -18$ to 0V , $V_{DS} = 800\text{V}$, $I_D = 14\text{A}$
Q_{gs}	Gate-to-Source Charge	--	9	--		
Q_{gd}	Gate-to-Drain (Miller) Charge	--	36	--		

Resistive Switching Characteristics

Essentially independent of operating temperature

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions
$t_{d(on)}$	Turn-on Delay Time	--	8	--	ns	$V_{GS} = -18$ to 0V , $V_{DD} = 800\text{V}$, $I_D = 14\text{A}$, $R_G = 10\Omega$
t_r	Rise Time	--	14	--		
$t_{d(off)}$	Turn-off Delay Time	--	10	--		
t_f	Fall Time	--	8	--		

NOTE:

[1] $T_J = +25^\circ\text{C}$ to $+150^\circ\text{C}$.

[2] $T_C = +25^\circ\text{C}$.

[3] Repetitive rating, pulse width limited by maximum junction temperature.

[4] $T_C = +25^\circ\text{C}$.

[5] Pulse width $\leq 380\mu\text{s}$, duty cycle $\leq 2\%$.

Typical Characteristics

Figure1. Typical output characteristics

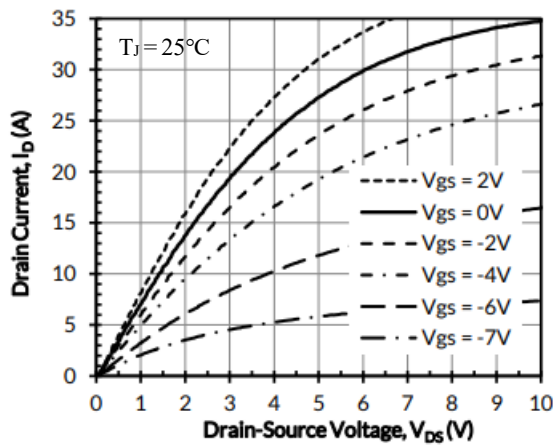


Figure2. Threshold voltage vs. junction temperature

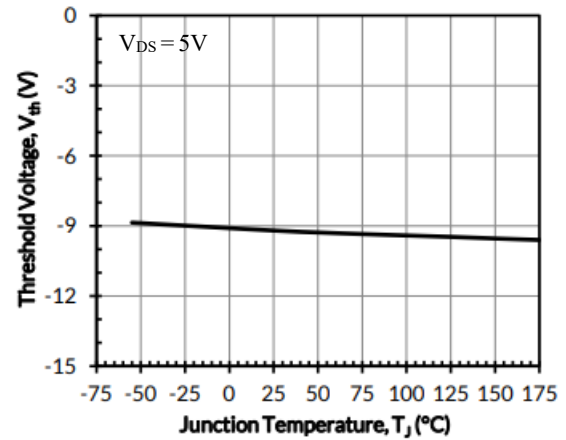


Figure3. Typical capacitances

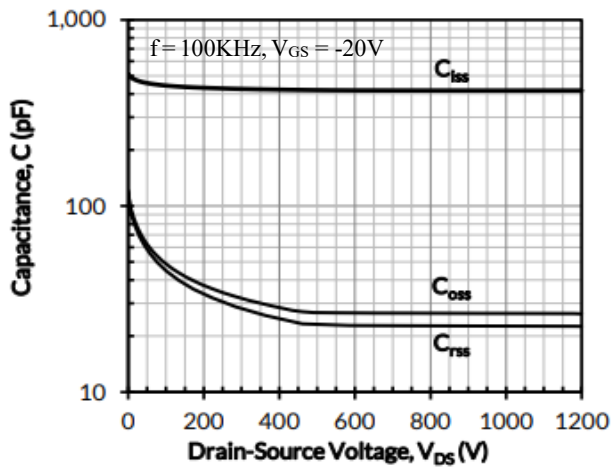
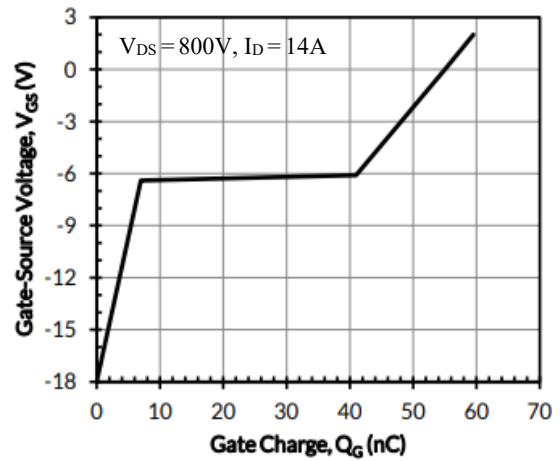
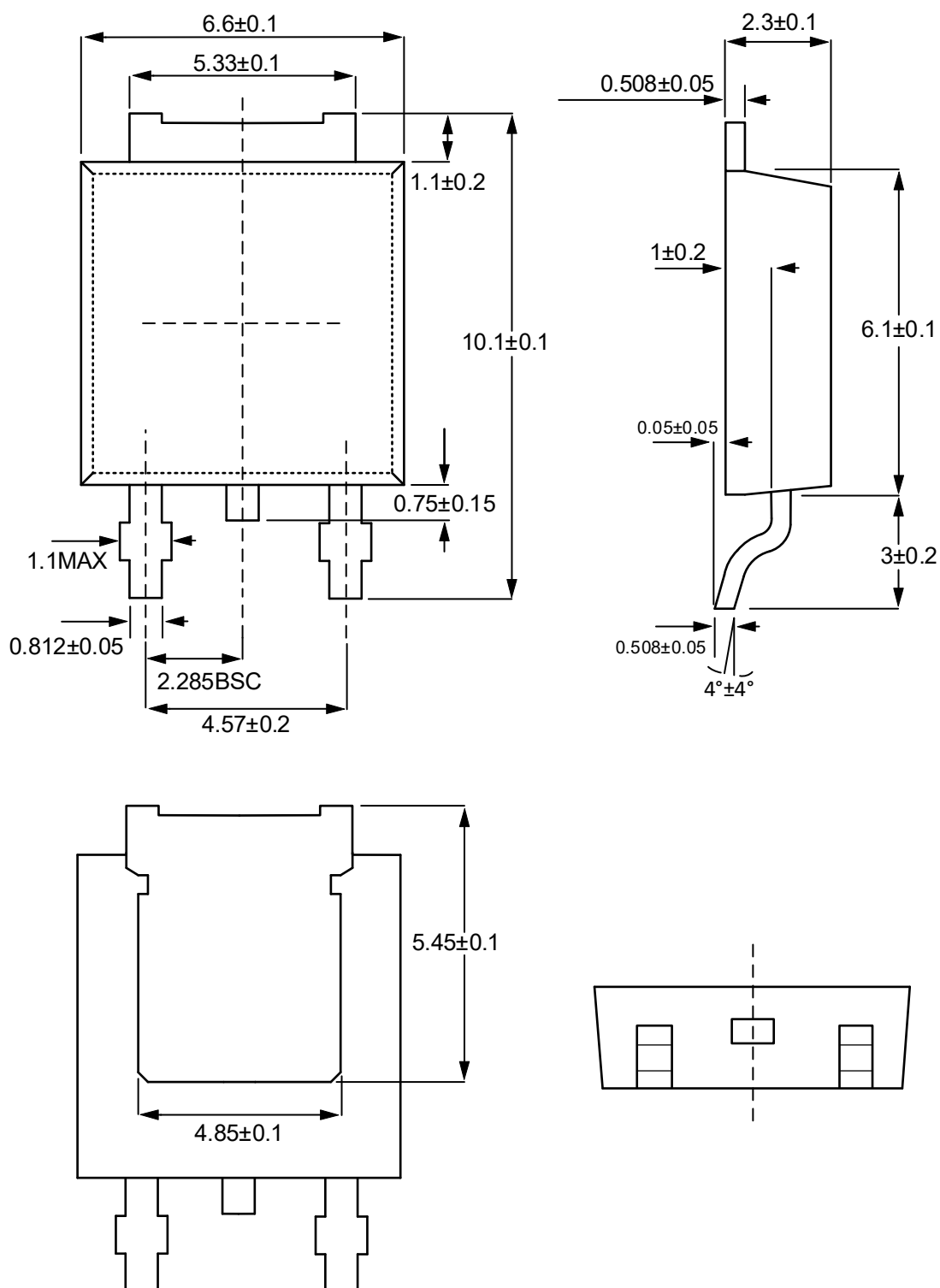


Figure4. Typical gate charge



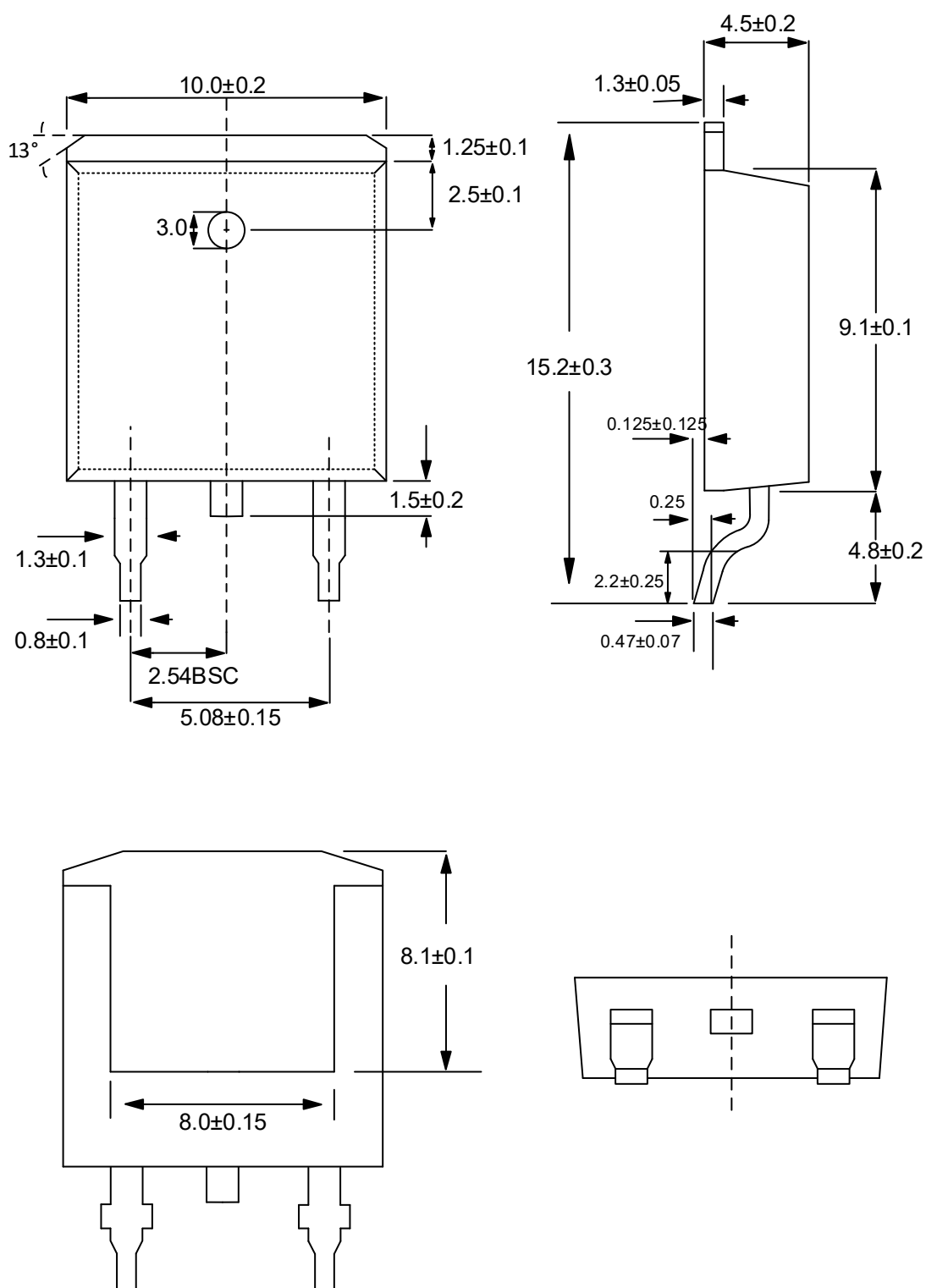
Package Dimensions

TO-252



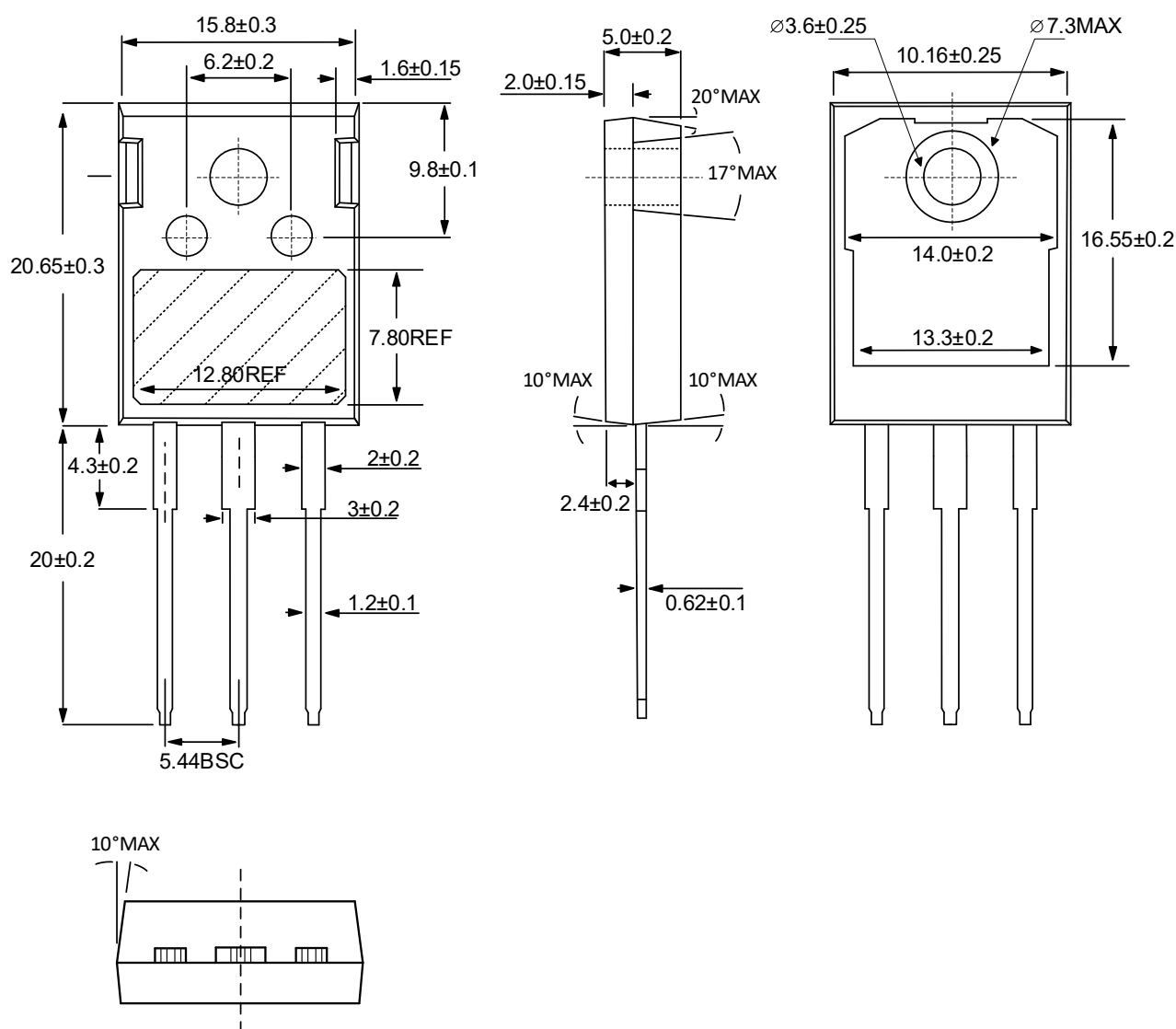
Unit: mm

TO-263



Unit: mm

TO-247



Unit: mm

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